

Banks Lake Drawdown

Final Environmental Impact Statement *Comments and Responses*



**U.S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Boise, Idaho**

**Upper Columbia Area Office
Ephrata Field Office
Ephrata, Washington**

May 2004



MISSION STATEMENTS

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.



The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Banks Lake Drawdown
Final Environmental Impact Statement
Columbia Basin Project, Washington

Comments and Responses

May 2004

U.S. Department of the Interior
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Comments and Responses

The Draft Environmental Impact Statement (DEIS) was filed with the Environmental Protection Agency (EPA) on January 6, 2003. A Notice of Availability and Public Hearings appeared in the *Federal Register* January 9, 2003. A news release announcing availability of the DEIS and dates, times, and locations of public hearings was sent to area media. Comments were scheduled to be received for 60 days until March 10, 2003.

Approximately 375 copies of the Draft EIS were distributed to Federal, State, and local agencies, native American tribes, irrigation districts, and interested members of organizations and the general public. The original 60-day comment period was extended 30 days from March 10 to April 11, 2003, at the request of the East Columbia Basin Irrigation District. Notice of the comment period extension was published in the *Federal Register* on March 17, 2003. A letter announcing the extension was mailed on March 4, 2003, to everyone who was sent a copy of the Draft EIS. A news release announcing the extension of the comment period was sent to area media. A total of 141 comment documents were received during the 90-day public review period January 6, 2003, to April 11, 2003. These documents and Reclamation's responses to the comments are included in this document (Comments and Responses).

A formal public hearing was conducted on February 11, 2003, in Coulee City, Washington, and on February 12, 2003, in Moses Lake, Washington. Eleven speakers gave formal oral testimony at the first public hearing, and three gave testimony at the second public hearing. Twenty-five entities and individuals provided written public hearing comments that are included in the hearing record. The public hearing testimony and written public hearing comments have been summarized and included in this document and in chapter 5, Consultation and Coordination. The public hearing record is available for public review at Reclamation's Upper Columbia Area Office in Yakima, Washington; in the Ephrata Field Office in Ephrata, Washington; and in the Pacific Northwest Regional Office in Boise, Idaho.

In addition, two private groups placed advertisements and comment forms in local newspapers, requesting comments be provided to Reclamation. Local private petitions were also distributed for signature stating opposition to the drawdown. About 275 signatures were affixed to the petitions.

The comment documents are presented in the order shown in the distribution list and in the table beginning on page 5. The responses follow the comment documents. The first page of each comment document and its response is identified in the table.

Many comments are repeated in several of the documents received. When a comment has already received a response, the reader is referred to the previous response. To aid the reader in finding these responses, the first page of the response is identified in the table. Responses begin on page 569.

Commenters are from the state of Washington unless otherwise indicated.

Public Hearing Comments

List of those providing public hearing testimony and written public hearing comments follow:

Herbert Adler, Moses Lake
Dale Anderson, Coulee City
Keith Bell, Ephrata
Glen C Bellah, Soap Lake
Douglas W. Brashear, Stratford
Cash Hardware, Daryl Parsons, Coulee City
Jennifer Clouter, Coulee City
Coulee City Chamber of Commerce, Paul Charlton, Coulee City
Coulee City Mayor, Otto Jensen, Coulee City
Coulee-Hartline School District Supt, Darrell Olson, Coulee City
Coulee Playland, Electric City, Hal Rauch, Grand Coulee
Clay Crook, Moses Lake
Karen Ann Crook, Moses Lake
John R. Dick, Othello
Dale Durbin, Moses Lake
East Columbia Basin Irrigation District, Dick Erickson, Othello
Sam Engelhardt, Moses Lake
Grant County Commissioner, District 1, Tim Snead, Ephrata
Grant County Commissioner, District 2, LeRoy Allison, Ephrata
Rick Heiberg, Coulee City
David D. Hopkins, Moses Lake
Craig Janett, Royal City
Jet Farms, Inc., Royal City
Dan Martell, Ephrata
Diana and Gerry McFaul, Moses Lake
Bert Moon, Wilber
Paul and Ann Nichols, Coulee City
Prior Farms, Arthur Prior, Warden
Quincy Columbia Basin Irrigation District, Keith Franklin, Quincy

Jim Randall, Coulee City
Clarence and Phyllis Rice, Coulee City
Murray Rushton, Coulee City
Alene Schwab, Stratford
Kelly Shinn, Moses Lake
Sun Banks Resort, George Hitzler, Electric City
Darrell Van Dyke, Quincy
Washington Farmers Union, Jim Davis, Coulee City,
 also representing Douglas County PUD Comm.
Wes and Verna Whitlinger, Coulee City
Byrdeen Worley, Moses Lake

The public hearing testimony and written public hearing comments are summarized below:

Economic impact—Economic impact to the local community “is not negligible.” Impacts will occur not only to the individual businesses and indirect sales when tourists stay away, but also to the revenue for community services and the local school system. Tourism keeps the communities near Banks Lake alive in the summer.

Economic impact to hydropower—Net reductions in hydropower generation at Grand Coulee and at Coulee City as a result of the drawdown could be significant and could be as much as \$1.5 million annually.

Recreation—Recreation access would be devastated. All boat launches in Banks Lake would be useless except for two; swimming and fishing access would be cut off or very limited.

Flow augmentation—The National Marine Fisheries Service says the Banks Lake drawdown has uncertainty surrounding the success of flow augmentation for fish survival. Adequate justification that the drawdown would benefit the endangered species in the lower portion of the Columbia River has not been provided.

Salmon value—The alternative appears to be another example of sacrificing a rural community for the endangered species. The salmon runs over the past couple of years have been at record levels.

Irrigated agriculture—Farmers everywhere are concerned with some of the heavy-handed actions of NOAA Fisheries and irrigation curtailments in other areas. The reliability of our water supply is our primary concern.

Visual quality—The last drawdown caused fish to die in muddy ponds, exposed mud flats, muddy water halfway across the lake, and huge dust storms as mud

flats dried, as well as a 2,500 acre “bathtub ring” around the lake. We do not wish this to happen yearly.

Health and safety—A lake drawdown would create an odor problem as well as add to the mosquito population and become a breeding ground for mosquitoes that could harbor the West Nile Virus.

Health and safety, lake navigation—If you could actually get your boat into the water, navigation on the lake would be unsafe for both property and people because of exposed rocks and tree snags.

Vegetation—Any significant change in the lake elevation would adversely affect groundwater levels during the growing season. Lower groundwater levels, in turn, has a potential to adversely affect the vegetation communities, including marshy areas around the edge of the lake, which now exhibit an abundance of birds and other animals.

Social environment—The National Environmental Policy Act not only requires the Federal Government to consider the impact of the actions on the environment but also to preserve culture, heritage, and customs. This action would negatively affect the customs and culture in the community. The drawdown would cause the community to lose the use of the lake, which would affect the quality of life.

Environmental justice—Environmental justice addresses the fair treatment of people of all races and incomes; no group of people should bear a disproportionate share of negative impacts from an environmental action. However, Grant County has 15 percent of the people who live below the poverty level compared with 10 percent for the State as a whole.

Alternatives and mitigation—The No Action Alternative still means that some water (5 feet of drawdown) could contribute to the flow and help with the salmon migration at McNary Dam. We’re not saying no water for mitigation, because that would happen. However, some oppose both the No Action and Action Alternatives.

State responsibility—State of Washington Salmon Recovery Act of 1998 says the State should “retain primary responsibility for managing the natural resources of the State....”

Cooperating agency—A request for cooperating agency status by Grant County had not been granted.

Procedural flaws —the 5-foot drawdown really is not the No Action Alternative; the Banks Lake operations before 2000 should be considered no action.

Written Comments

The following table provides the list of those commenting in distribution list order, with the page number of the comment document and the first page of the response shown in the table.

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FA 01	Department of Commerce, National Oceanic and Atmospheric Administration Fisheries (formerly National Marine Fisheries Service), Portland, Oregon	9	575
FA 02	Department of Energy, Bonneville Power Administration, Portland, Oregon	14	576
FA 03	Department of the Interior, U.S. Geological Survey, Reston, Virginia	18	577
FA 04	Environmental Protection Agency, Seattle	19	577
IT	Indian Tribes		
IT 01	The Confederated Tribes of The Colville Reservation, History/Archaeology Department, Nespelem	21	579
IT 02	Spokane Tribe of Indians, Spokane Tribal Natural Resources, Wellpinit	24	580
CO	Congress and Washington Legislature		
CO 01	Representative Doc Hastings, Washington DC	27	581
CO 02	Washington State Legislature, State Senator Joyce Mulliken, State Representatives Janea Holmquist and Bill Hinkle, Olympia Also received by fax.	29	582
SL	State and Local Government Agencies		
SL 01	Department of Ecology, Spokane	31	583
SL 02	Department of Natural Resources, Natural Heritage Program Olympia	37	586
SL 03	Washington State Potato Commission, Moses Lake Also received by email with summary of comments	38	586
SL 04	Ferry County Natural Resource Board, Republic, Also received by email	160	592
SL 05	Franklin County Commissioners, Sue Miller, Neva J. Corkrum, Frank H. Brock, Pasco, Washington	163	592
SL 06	Douglas County Public Utility District No. 1, East Wenatchee	167	593
SL 07	Grant County Board of County Commissioners, Ephrata	168	593
SL 08	Grant County Board of Health, Ephrata	283	596
SL 09	Grant County Port District No. 4, Coulee City	284	596
SL 10	Grant County Public Utility District No. 2, Ephrata	285	596
SL 11	South Banks Lake Mosquito Control District #3, Coulee City	287	596
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SL 13	Warden, Port of, Warden	289	597

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ID 04	Quincy-Columbia Basin Irrigation District, Quincy	393	602
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IO		Interested Organizations	
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IO 02	Big Bend Development Council, Moses Lake	406	605
IO 03	Coulee City Chamber of Commerce, Coulee City	407	605
IO 04	Columbia Basin Development League, Royal City	410	606
IO 05	Columbia River Inter-Tribal Fish Commission, Portland, Oregon; Also received by e-mail	412	606
IO 06	Grand Coulee Dam Area Chamber of Commerce, Grand Coulee	416	607
IO 07	Grand Coulee Project Hydroelectric Authority, Ephrata	418	607
IO 08	Grant County Economic Development Council, Moses Lake	426	607
IO 09	Grant County Tourism Commission, Ephrata	428	607
IO 10	Moses Lake Area Chamber of Commerce, Moses Lake	429	608
IO 11	Moses Lake Area Chamber of Commerce, Moses Lake	430	608
IO 12	Moses Lake Chamber of Commerce, Moses Lake	431	608
IO 13	Pacific Northwest Waterways Association, Portland, Oregon	432	608
IO 14	Quincy Valley Chamber of Commerce, Quincy	433	608
IO 15	Saint Andrews Grange, Coulee City	434	608
IO 16	Washington State B.A.S.S. Federation, Banks Lake Enhancement Program, Wilbur	435	608
IE		Interested Entities and Individuals	
IE 01	Maurice Anding, Coeur d'Alene, Idaho	439	611
IE 02	Denise Arango, Othello	440	611
IE 03	Leon and Janice Bafus, Lind	441	611
IE 04	Banks Lake Net and Charter, Coulee City	442	611
IE 05	Basic American Foods, Moses Lake	443	611
IE 06	Vera Bauman, Wilson Creek	445	611
IE 07	Roy and Laverna Bechtol, Coulee City	446	611
IE 08	Ken Benoschek, Soap Lake	447	611
IE 09	Claude E. Bjorson, Grand Coulee	448	611
IE 10	Muriel Bott, Pomeroy	449	611
IE 11	Terry Brewer, Soap Lake	450	612
IE 12	Mary Pat Brown, Coulee City	452	612
IE 13	Pat Burdick, Ephrata	453	612
IE 14	Anne Carter, Ephrata	454	612
IE 15	Wilbur Carter, Soap Lake	455	612
IE 16	Donald L. Center, Freda Center, Coulee City	456	612
IE 17	Central Bean Co., Inc., Quincy	457	612
IE 18	Tammi Chamberlain and Ted Ayers, Ephrata	458	612
IE 19	Arlene Coates, Coulee City	459	612
IE 20	Phil and Chris Copenhaver, Moses Lake	460	613
IE 21	Lee and Margaret Davis, Moses Lake	461	613

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IE 23	Charles F. Dickinson, Soap Lake	463	613
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IE 26	Brian S. Evans, Moses Lake	466	613
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IE 40	Hendrix Farms, Moses Lake	495	615
IE 41	Ken Holm, Ephrata	496	615
IE 42	Carole Hopkins, Moses Lake	497	615
IE 43	Fred "Fritz" Howard, Soap Lake	498	615
IE 44	Jack Jenkins, Soap Lake	499	615
IE 45	Karen Jones, Spokane	500	615
IE 46	V. Joyce Jones, Coulee City	501	615
IE 47	Greg Kardong, Moses Lake	503	615
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IE 63	Hubert P. Mills, Cheney	521	617
IE 64	Robert N. and Gudu Mosher, Ephrata	522	617
IE 65	Sherry L. Murray, Moses Lake	523	617
IE 66	Jean Nicholson, Grand Coulee area	524	617
IE 67	Brian O'Shea, Quincy	525	617
IE 68	Mike Palko, Tenino	526	617
IE 69	Gregory E. Parker, Coulee City	527	617

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IE 71	Jerry Pemmington, East Wenatchee	529	618
IE 72	Barbara Poulson, Connell	530	618
IE 73	Prather's Welding & Fabrication, Inc., Coulee City	531	618
IE 74	Gene and Ruth Reynoldson, Coulee City	532	618
IE 75	M.P. Riley, Cedarburg, Wisconsin	533	618
IE 76	Rimrock Meadows, Ephrata	534	618
IE 77	Wesley J. Roberts, Coulee City	535	618
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IE 83	Lisa G. Smith, Ellensburg	543	619
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IE 85	Gary and Pat Suko, Moses Lake	545	619
IE 86	Sunbanks LTD, Bellevue	546	619
IE 87	Arnold J. Theisen, Irrigon, Oregon	550	619
IE 88	Adam Throneberry, Moses Lake	551	619
IE 89	John and Ruth Umberger, Methow	552	620
IE 90	Jim Vordahl, Coulee City	553	620
IE 91	Voss Farms	554	620
IE 99	Judith R. Warner, Benton City	562	621
IE 92	Rod Webster, Coulee City	555	620
IE 93	June M. West, Anacortes; Also received by email	556	620
IE 94	Don White, Coulee City	557	620
IE 95	David Windish	558	620
IE 96	Wayne Wollard, Monroe	559	620
	Petitions received without letters	563	

Federal Agencies—Regional or Local Levels — FA

COMMENT FA 01



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 525 NE Oregon Street
 PORTLAND, OREGON 97232-2737

F/NWR5

April 11, 2003

Jim Blanchard
 Special Projects Officer
 US Bureau of Reclamation
 PO Box 815
 Ephrata, WA 98823-0815

RE: National Marine Fisheries Service's (NOAA Fisheries) Comments on the Banks Lake Drawdown, Draft Environmental Impact Statement.

Dear Mr. Blanchard:

Thank you for the opportunity to comment on the Banks Lake Drawdown, Draft Environmental Impact Statement. This environmental analysis was conducted to evaluate the effect of drafting Banks Lake to elevation 1,560 feet - a 10-foot drawdown. This evaluation was called for in Action 31 in the NOAA Fisheries' 2000 Federal Columbia River Power System (FCRPS) Biological Opinion. Completion of this NEPA analysis provides the information needed to evaluate the environmental effects of operating this project 10 feet from full.

In general, the document was thorough in its analysis. We support the conclusions of the document, although question why the refill of Banks Lake needs to occur in a 10-day period in September. We strongly support the extension of boat ramps and dock facilities to mitigate the recreational impacts of the proposed operation. An extended refill period of the lake to 1,565 feet (greater than 10 days) would assume the ramp improvements have been made. We believe the document could be improved by the following recommendations:

1. Clearly state early in the document that this operation is being evaluated to increase flows in the lower Columbia River to improve the survival of Endangered Species Act listed Snake River juvenile fall chinook, as well as helping improve the survival of Hanford Reach juvenile fall chinook, which are not listed.
2. Provide a more complete list of citations which describe the effect of flow on juvenile fall chinook survival.
3. Include in the economic analysis of the proposed action alternative an evaluation using separate energy replacement costs for the months of August and September instead of assuming a weighted average marginal cost of power for both months. For example, Northwest Power and Conservation Planning Council staff indicate that the average marginal cost of energy in August is about \$40 and average marginal cost of energy in

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September is about \$32.50. Applying these monthly average marginal energy values to the FCRPS energy impacts associated with the proposed action alternative indicates that implementation of the proposed action could result in a net revenue increase to the FCRPS of about \$4 million. Thus we recommend the economic evaluation be redone to reflect the monthly average marginal energy values.

04

For your convenience, more specific proposed changes in the document are enclosed. We appreciate the opportunity to comments on the Draft Environmental Impact Statement. If you have any questions on these comments please contact Paul Wagner of my staff at 503-231-2316.

Sincerely,



Brian J. Brown
Assistant Regional Administrator
Hydropower Division

Enclosure

cc: Jim Fodrea, USBR
Lorri Bodi, BPA
Witt Anderson, USACE
Bill Shake, USFWS

NOAA Fisheries

Comments on the Banks Lake Drawdown, Draft Environmental Impact Statement

Note: The redline/strikeout format was used to propose edits to the existing text. The page and paragraph location of the text is referenced at the beginning of each paragraph where a change is proposed.

S-1 Purpose and Need.

The purpose of the proposed action is to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed anadromous salmonid stocks (specifically Snake River fall chinook salmon) by altering the August drawdown of Banks Lake from elevation 1565 down to elevation 1560. An evaluation of the environmental effects of operating Banks Lake up to 10 feet down from full pool ~~to comply~~ with Action 31 of the Reasonable and Prudent Alternative of the Federal Columbia River Power System of the Reasonable and Prudent Alternative of the Federal Columbia River Power System Biological Opinion, issued by the National Marine Fisheries Service on December 21, 2000.

The project need is to provide increased flows to improve the survival of ESA-listed salmonid stocks by modifying Banks Lake's operations.

05

1-1 Purpose and Need.

The purpose of the proposed action is to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA listed anadromous salmonid stocks (specifically Snake River fall chinook salmon) by altering the August drawdown of Banks Lake from elevation 1565 down to elevation 1560. An evaluation of the environmental effects of operating Banks Lake up to 10 feet down from full pool ~~complies to comply~~ with Action 31 of the Reasonable and Prudent Alternative of the Federal Columbia River Power System of the Reasonable and Prudent Alternative of the Federal Columbia River Power System Biological Opinion, issued by the National Marine Fisheries Service on December 21, 2000.

The project need is to provide increased flows to improve the survival of ESA-listed salmonid stocks by modifying Banks Lake's operations.

06

2-1 second paragraph under Alternatives Development Process

Banks Lake reservoir ~~has always been~~ is authorized to operate between the full pool elevation of 1570 feet and a minimum elevation of 1545 feet at any time of the year. However, since 1981 the August reservoir elevation of Banks Lake has ranged between 1569.5 feet and 1565 feet. Reclamation has determined that these historic operations of Banks Lake reservoir elevations (between 1570 feet and 1565 feet) constitute the normal August operations. ~~The TMT~~ During the development of the 2000 FCRPS Biological Opinion NMFS (NOAA Fisheries) considered how fish passage could be further optimized by using additional water between elevations 1565 and 1560, which is evaluated in the pProposed Action Alternative.

07

3-10 last paragraph of the page under the heading Fish

The last sentence of this paragraph is not completed. It is uncertain how much of the paragraph is missing in the printed copy of this document.

08

3-21 National Marine Fisheries Service

Banks Lake drawdown is one of several RPA actions recommended by NMFS to improve flows for ESA listed juvenile anadromous migrating fish. In addition to providing physical barriers

09

4-2 No Action Alternative

The last sentence in this paragraph is not completed. It is uncertain how much of the paragraph is missing in the printed copy of this document.

10

4-18 Action Alternative

National Marine Fisheries Service. —The Banks Lake drawdown would augment flows in August, when the flow objectives at McNary Dam are 200,000 cfs. This flow objective is intended to primarily benefit Snake River fall chinook salmon. The non-listed Hanford Reach fall chinook population would benefit from this operation as well. The Snake River fall chinook juvenile migrations tends to peak at McNary Dam in the second half of mid-July with numbers tapering off through into mid-August. Nearly half of the Snake River fall chinook can be transported from the Snake river collector dams and may not benefit from flow augmentation through the McNary to Bonneville reach of from the Columbia River. However, even barged fish are likely to benefit from flow augmentation from Bonneville Dam to ocean entry.

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There is some uncertainty surrounding flow augmentation benefits for fish survival. Snake River fall chinook is one species that appears to have a stronger flow survival relationship, although that survival relationship is also influenced by water temperature and turbidity (Giorgi, Miller, and Stevenson 2002; Bilby et al. 2002; Connor et al. (1998); Connor et al. (2000); Connor et al. (2001); Connor et al. (2002); Connor et al. (In pressa); Connor et al. (in pressb));

13

4-45 Anadromous Fish

An action called for in the NMFS BIOP (NMFS 2000) is flow management ~~was based among other things~~ as a measure to improve the survival of ESA-listed salmon. Maintenance of a flow of 200,000 cfs at ~~on maintaining certain flows at~~ McNary Dam during the July - August period is an objective of this BIOP. This flow ~~target~~ objective is achievable only with water coming from a variety of sources. But during August of many years, the flow objective ~~target~~ is not achievable without utilizing additional water from storage. To supplement flows during August, the action agencies will add water to the river from a number of sources, including (according to the proposed action) Banks Lake. While individually not significant in the overall flow of the Columbia River, the contribution to ~~that flow by~~ Banks Lake water, coupled with water from other sources, makes it possible to meet flow objectives ~~targets~~ in a majority large number of years.

14

4-46 third paragraph under Relationship Between Short -Term Uses and Long-Term Productivity

The Banks Lake water would be used to augment the flows in August when salmon flow objectives at McNary Dam are less than 200,000 cfs. This flow objective is intended to primarily benefit ESA-listed Snake River fall chinook salmon, although these flows also are likely to benefit the non-listed Hanford Reach fall chinook population. The Snake River fall chinook migration tends to peak in the second half of mid-July with numbers tapering off ~~into mid-~~ through August. Nearly half of the Snake River fall chinook can be transported from the Snake River collector dams and may not benefit from flow augmentation through the McNary to Bonneville reach of ~~from the~~ Columbia River. However, even barged fish are likely to benefit from flow augmentation from Bonneville Dam to ocean entry. In addition, there is some uncertainty surrounding flow augmentation benefits for fish survival. Snake River fall chinook is one species that appears to have a stronger flow survival relationship, although that survival relationship is also influenced by water temperature and turbidity. It is ~~hoped~~ anticipated that the additional August flow will enhance the survival of listed Snake River fall chinook populations.

Additional References Cited:

Connor et al. (1998) - Detection of PIT-Tagged Subyearling Chinook Salmon at a Snake River Dam: Implications for Summer Flow Augmentation (North American Journal of Fisheries Management)

Connor et al. (2000) - Forecasting Survival and Passage of Migratory Juvenile Salmonids (North American Journal of Fisheries Management)

Connor et al. (2001) - Early Life History Attributes and Run Composition of PIT-Tagged Wild Subyearling Chinook Salmon Recaptured after Migrating Downstream Past Lower Granite Dam (Northwest Science)

Connor et al. (2002) - Juvenile Life History of Wild Fall Chinook Salmon in the Snake and Clearwater Rivers (North American Journal of Fisheries Management)

Connor et al. (in pressa) - Migrational Behavior and Seaward Movement of Wild Subyearling Fall Chinook Salmon in the Snake River (North American Journal of Fisheries Management)

Connor et al. (in pressb) - The Influence of Flow and Temperature on Survival of Wild Subyearling Fall Chinook Salmon in the Snake River (North American Journal of Fisheries Management)

COMMENT FA 02



MAR 17 2000

Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

POWER BUSINESS LINE

In reply refer to: PG-5

Mr. Jim Blanchard, Special Projects Officer
U.S. Bureau of Reclamation
32 C Street
P.O. Box 815
Ephrata, WA 98823-0815

Dear Mr. Blanchard:

We are submitting comments that reflect input on your Banks Lake Drawdown Draft Environmental Impact Statement (EIS); this input is from the Bonneville Power Administration's (BPA) Operation Planning and Biological Opinion (BiOp) Implementation staff.

We would like to express our appreciation for your work in support of the Action Agencies and their implementation of the National Marine Fisheries Service 2000 BiOp of the Federal Columbia River Power System.

We have attached two technical pages of detailed comments for you to consider as you prepare the Final EIS. Most of our comments focus on the effects that this operation would have on hydropower generation and power revenues.

Our greatest concern pertains to the rapid refill schedule that is proposed for Banks Lake (September 1- September 10). We request that you consider an alternative refill target date of December 31 in the final EIS. A protracted refill would provide BPA the flexibility to refill Banks Lake during low price periods and light load hours. The economic benefits of refilling during low price periods could mean as much as \$1 million or more. Kristine Barlett, on my staff, has prepared the economic impact comments attached. [Please contact her with questions at (503) 230-3931; email: kibartlett@bpa.gov.]

The Draft EIS was also reviewed by Jim Irish our water quality manager. His comments are also included. We would like you to discuss in the Final EIS the role that Banks Lake might have in implementing the soon-to-be released water quality total maximum daily load (TMDL) for temperature on the Columbia River. The Draft Summary Implementation Strategy for the TMDL has proposed looking at selective warm water withdrawals from Lake Roosevelt to Banks Lake. It may be that the Banks Lake Drawdown and a protracted

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selective warm water refill in the fall may also advance water quality objectives.
[Please contact Jim Irish at (503) 230-5914; email: jirish@bpa.gov.]

02

Thank you for your consideration of our comments.

Sincerely,



Gregory K. Delwiche
Vice President, Generation Supply

Enclosure

General Comments

Economic Consideration of Banks Lake Refill: The accelerated refill schedule, from 1560' to 1565' in 10 days (Sept. 1 – Sept. 10), has the potential to be costly for BPA. There are two reasons that this short refill period is potentially expensive.

The first reason is the amount of water that will be taken out of Grand Coulee to fill 5' in Banks Lake. This movement of water from Lake Roosevelt into Banks Lake will come in the form of foregone sales or purchases – both of which will cost BPA. In order to minimize costs BPA requests the flexibility to refill Banks Lake during periods when energy prices are lowest. Typically the low price periods occur during light load hours (LLH) and weekends but they can occur at other times. If the refill period is restricted to 10 days BPA is forced to refill during a time that might not be economical. If more time were allowed for refill, BPA would then be able to take advantage of the low priced periods and therefore reduce the cost of refill.

The Dow Jones daily firm Mid-C Index for the past 7 years shows a LLH and heavy load hour (HLH) price differential for September ranging from \$3 to \$13 (with the HLH always being higher). If a \$5 price differential is assumed between HLH and LLH and an energy equivalent of the water being pumped into Banks Lake is assumed to be 89,000 MWh, the cost to BPA of not being able to take advantage of lower price periods to move that water into Banks Lake would be approximately \$350,000 (\$450,000 total FCRPS cost including costs allocated to BPA's Slice customers). If a \$10 price differential is assumed the cost increases to \$690,000 (\$890,000 total FCRPS cost including Slice customers allocation).

The second reason why the accelerated refill schedule is potentially costly to BPA is the load increase that occurs from pumping water into Banks Lake. Typically BPA attempts to maximize pumping in the LLH. The reason for this is BPA's system loads are lighter during those hours and the value of electricity tends to be less making it is more economical to pump on LLH as opposed to HLH. Due to the short refill period (10 days) it will be necessary to operate the pumps around the clock in order to keep up with irrigation withdraws *AND* refill 5' into Banks Lake. If more time were allowed to refill the 5' into Banks Lake BPA would be able to shape the pumping into the LLH and weekends and therefore could avoid pumping on the more costly HLH.

Worst case scenario: 5' refill of Banks Lake would be pumped entirely on HLH. This could be caused by either heavy irrigation withdraws and/or pump outages.

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Assuming the same \$5 price differential, as mentioned above, between LLH and HLH and a total pumping load of 33,000 MWh, the inability to shape the pumping load into the LLH would cost BPA approximately \$125,000 (\$165,000 total FCRPS cost including costs allocated to BPA's Slice customers). If the price differential is increased to \$10 the cost increases to \$250,000 (\$330,000 total FCRPS cost including Slice customers allocation). If more time is allowed for refill there exists the ability to shape the pumping into LLH and therefore avoid this cost.

Given the assumptions above regarding LLH/HLH price differential, if the two potential cost pieces from above are added together the total cost to BPA from the accelerated refill of Banks Lake can be estimated at approximately \$1,000,000 – more if the differential between HLH and LLH were greater than \$10, less if the differential were smaller than \$10. If more time was allowed for refill this cost could potentially be avoided.

Preferred Drawdown Alternatives: Of the drawdown alternatives examined BPA prefers the late draft alternatives. These alternatives are preferable because they provide additional generation in the second half of the month when streamflows are receding and generation is dropping. Also as the elevation of Banks Lake drops below 1568', BPA begins to lose the ability to use the pump/generators as generators. Keeping the lake level above this elevation for as long as possible preserves BPA's ability to generate with these units.

Water Quality Issues at Banks Lake: Assuming that the proposed Temperature TMDL will be put into effect during the time this drawdown is proposed, would the temperature of Banks Lake exceed the loading capacity given for the next downstream dam as allocated within the site potential allowance?

Would the Low Water/Early draft and Early Draft cause Banks Lake to exceed the temperature requirements as waters of the state under the proposed WADOE Water Quality Standards that are considered for adoption by the state in July 2003? While the current water quality standards include agricultural water supply as a protected use, they do not clarify what level of water quality is needed. Some pollutants can adversely affect the direct use of water for agricultural water supplies without further treatment, particularly for irrigation. Would the low water/early draft and early draft cause the lake to exceed criteria identified as important for agricultural water supplies such as: electrical conductivity, dissolved oxygen, bicarbonate, Total Suspended Solids and pH?

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COMMENT FA 03

From: "Patricia E Riley" <periley@usgs.gov>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Mar 5, 2003 10:12AM
Subject: EIS Review

Jim,

USGS has no comments on Draft EIS for the Banks Lake Drawdown.

Thanks.

Trish Riley
U.S. Geological Survey
423 National Center
Reston, VA 20192
703.648.6822

COMMENT FA 04



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

March 7, 2003

Reply To
Attn Of: ECO-088

Ref: 01-026-BOR

Jim Blanchard
Bureau of Reclamation
Ephrata Field Office
P.O. Box 815
Ephrata, Washington 98823

Dear Mr. Blanchard:

The Environmental Protection Agency has received the Draft Environmental Impact Statement (EIS) for the proposed **Banks Lake Drawdown** (CEQ No. 030006) for review in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act.

EPA Region 10 has used a screening tool to conduct a limited review of the draft EIS and, based upon the screen, we do not foresee having any environmental objections to the proposed project. Therefore, we will not be conducting a detailed review of the draft EIS.

Should you have any questions, please contact Bill Ryan of my staff at (206) 553-8561.

Sincerely,


Judith Leckrone Lee, Manager
Geographic Implementation Unit

Indian Tribes — IT

COMMENT IT 01



**THE CONFEDERATED TRIBES
of
THE COLVILLE RESERVATION**
POST OFFICE BOX 150-NESPELEM WASHINGTON 99155 PHONE (509) 634-4711

April 4, 2003

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street, P.O. Box 815
Ephrata, WA 98823

RE: Comment to Banks Lake Drawdown Draft Environmental Impact Statement (Draft EIS)

Dear Mr. Blanchard:

Unlike the unstable and eroded Columbia River valley, the Upper Grand Coulee was abandoned as a glacial lake spillway about 10,500 B.C. Since then, the Upper Grand Coulee remained fairly stable until the filling of Banks Lake in 1951. The cultural significance of the Upper Grand Coulee lies in the fact that land surfaces along the floor of the coulee are 6,000 years older than any of the landforms along the Columbia River other than the higher terraces. Landforms around Banks Lake have the potential to extend the regional cultural historical record back to the Late Pleistocene/Early Holocene boundary. The landforms in and around Banks Lake have the potential to contain occupation sites that relate to some of the earliest time frames and, in fact, the area could contain Clovis-age and pre-Clovis age sites.

Upper Grand Coulee potentially contains sites relevant to the oldest traditions of the Colville Confederated Tribes (CCT). Protection and understanding of these sites is in the interest of the CCT. Conceptually, the proposed undertaking should have no adverse effects. The CCT recognizes there will be adverse effects. If effects are not mitigated or avoided, the CCT may have to litigate for compensation. Therefore, the History/Archaeology Program requests consultation with Bureau of Reclamation (BOR) staff on their idea of and position on their trust responsibility to the CCT.

The CCT History/Archaeology Department reviewed the Draft Environmental Impact Statement (DEIS) for the Banks Lake Drawdown and has several comments.

- I. According to the Federal Register 66(80):20832, a drawdown of at least 10 feet in Banks Lake could occur annually. The DEIS does not include the fact that the 10 foot drawdown could be an annual occurrence.

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2. A Class III Archeological and Historical Inventory of the Banks Lake Project Area (Draft) by Stephen C. Hamilton and Brent Hicks prepared in 2000 is cited in the body of the DEIS and listed in the bibliography. This document has been updated to include the further survey and testing mentioned as being incomplete in your DEIS

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The cultural resources reports A Class III Archeological and Historical Inventory of the Banks Lake Project Area (Draft) by Stephen C. Hamilton and Brent Hicks prepared in 2002 and A Class III Archaeological, Historical, And Traditional Cultural Properties Inventory of The Banks Lake Fall 2002 Drawdown Zone, Douglas And Grant Counties, Washington (Draft) by Martin Engseth prepared in 2003 need to be included in the cultural resources studies section for the final EIS.

3. Historic Resources, Page 3-43, identifies two properties listed on or determined eligible "for listing on a historic register..." This line should read "for listing on the National Register of Historic Places..." The section fails to mention that until determined otherwise, all historic properties are treated as though they are eligible to the National Register. Failure to mention that the hundreds of sites in the Banks Lake vicinity are treated as if they are eligible gives the public, the CCT, and the agency the impression only the two sites mentioned might require further action.

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4. Traditional Cultural Properties, Page 3-44, mentions a 1997 TCP study. There is no mention that there were in fact two TCP documents prepared, an inventory presented in tabular form with a minimum of explanatory text and a draft narrative TCP study (citations withheld, see next paragraph). These documents do in fact identify 20 TCPs. The DEIS fails to note that the first of these places includes the entire Upper Grand Coulee. As with comment No. 3 above, failure to identify a fuller understanding of the spectrum of cultural resources may mislead the public and BOR as to potential future investigations; it fails to represent the interests of the CCT.

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Both TCP documents mentioned above are confidential statements in support of proper resource management. They are not cited in the DEIS bibliography. Confidential documents cannot be released to the public, but not to identify and characterize the nature of such documents fails to display the management efforts of the CCT and the BOR to date.

5. Factors that might affect differences in the Action Alternative and the No Action Alternative such as the inability to refill Banks Lake by a deadline date, mechanical pump problems, low water years, high water years, energy demand issues, and maintenance requirements are not adequately addressed in these alternatives or in the operational scenarios within the alternatives.

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6. Due to the date of preparation of the DEIS, recommendations made in the various cultural resource surveys are not adequately addressed in either of the two alternatives presented. The results of the fieldwork conducted in the last two years may affect decisions within these two alternatives regarding Section 106 compliance.

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7. More specifically, in Chapter 4, Environmental Consequences, Historic Resources and Traditional Cultural Properties, Pages 4-34 and 4-35, neglects the impact of recreation on cultural resources. There is little doubt that a 10 ft. drawdown during the peak of tourist season will attract or invite heavy visitation along the drawdown zone. Visitation will lead to intentional or innocent collection of artifacts, perhaps even stimulating organized looting of cultural deposits.
8. There is inadequate discussion of TCP studies in the DEIS. In fact on page S-7 under the "Continuation of Existing Trends" in the No Action Alternative there are TCP impacts that will require consultation with the CCT.

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Sincerely,



Adeline Fredin
Tribal Historic Preservation Officer

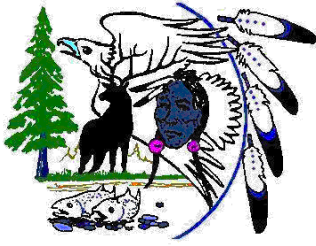
Cc: project files
Chrono

COMMENT IT 02

From: "Deanne Pavlik" <deannep@spokanetribe.com>
To: <jblanchard@pn.usbr.gov>
Date: Fri, Apr 11, 2003 9:14AM
Subject: Banks Lake EIS Comments

See attached.

Deanne Pavlik
Spokane Tribe Of Indians - LRFEP
deannep@spokanetribe.com
(509)258-7020 ext 24
(509)258-9600



Spokane Tribal Natural Resources

P.O. Box 100 ? Wellpinit, WA 99040 ? (509) 258 – 9042 ? fax 258 - 9600

Comments on the Banks Lake Environmental Impact Statement

Concerns primarily arise concerning lack of clarity surrounding the refill of Banks Lake from Lake Roosevelt. The purpose of the EIS is to describe and analyze the Bureau of Reclamations proposed action to lower the August surface elevation of Banks Lake. The area included in the draft EIS consists of the “actual lake and its surrounding areas”. The reliance of Banks Lake on Lake Roosevelt for water suggests that Lake Roosevelt should be included as a “surrounding area”.

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However, the EIS does not address potential effects of changed hydro-operations at Grand Coulee Dam. Changes in hydro-operations in Lake Roosevelt shift water residence times, elevation, outflow, etc, which directly impact the biota of Lake Roosevelt. For example, increased outflow through the 3rd powerhouse, as suggested in the proposed action for the month of August, has the potential to increase entrainment rates, resulting in greater losses of fish from Lake Roosevelt.

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How agencies intend to address competing needs for Columbia River water, including Banks Lake refill, flow augmentation for salmon, and Lake Roosevelt water residence time and elevation goals as currently identified in the Biological Opinion, are unclear. Refill strategies the Bureau of Reclamation intends to implement to ensure Banks Lake is refilled by the proposed deadline, and their potential effects on the reservoirs, have not been addressed. Of particular concern are strategies for refilling Banks Lake that may rely on greater releases from Lake Roosevelt, and the effects those strategies may have on Lake Roosevelt hydro-operations, water quality, and biota.

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Deanne Pavlik
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Wellpinit, WA 99040
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Fax (509) 258 – 9600
E-mail deannep@spokanetribe.com

Congress and Washington Legislature — CO

COMMENT CO 01

DOC HASTINGS
4TH DISTRICT, WASHINGTON
ASSISTANT MAJORITY WHIP
COMMITTEE ON RULES
COMMITTEE ON THE BUDGET



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(509) 545-8396

302 EAST CRESTVIEW
YAKIMA, WA 98901
(509) 452-3243

Congress of the United States
House of Representatives

**Congressman Doc Hastings' Comments on the
Banks Lake Drawdown Draft Environmental Impact Statement**

April 11, 2003

Having reviewed the Bureau of Reclamation's draft EIS, I must express my serious concerns about the document's 1) lack of scientific justification for a flow-augmenting drawdown, 2) the complete absence of provable, measurable benefits of a drawdown for fish, and 3) the underestimation of the devastating economic effects of a drawdown.

The Bureau's assessment of a potential Banks Lake drawdown is the result of a requirement included in the National Marine Fisheries Service's December 2000 Biological Opinion on the Federal Columbia River Power System (BiOp). This mandated study was specifically directed to assess a drawdown of up to 10-feet for the purposes of augmenting the water flow of the Columbia River during the month of August.

The *specificity* of the BiOp on this study implies that *specific* benefits are anticipated to potentially result from a drawdown. However, the draft EIS is void of any scientific information, statistics or facts by which to justify any drawdown. There is no *specific* documentation in the draft on how increased flow would help endangered fish.

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Without specific defined benefits for fish, a drawdown action by the federal government would be relying on mere assumptions and best guesses. Recent history make clear that this can be a recipe for disaster – and it is the livelihood of local businesses and the economies of local communities that will suffer.

The draft EIS addressed the economic impacts of drawdown alternatives. However, I do not believe the draft's analyses accurately represent either the degree or magnitude of how a drawdown would negatively affect local enterprises and communities.

In fact, the narrow focus on how drawdown water levels will affect certain recreational enterprises' individual operations results in the draft EIS seriously discounting the broad, certain economic effects of a drawdown. Sufficient attention and consideration is not given to the seasonal and interdependent nature of the local communities' economics.

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Hastings' Comments
Banks Lake Drawdown Draft EIS
-continued-

The target drawdown month of August is a peak tourism period for Banks Lake recreation. This tourism season represents a significant portion these recreation businesses' annual earnings. A drawdown would not simply affect one month out of a business's year – a drawdown would strike at the heart of their survivability.

In addition, the economic impact of a drawdown action is not limited to the recreation enterprises – it affects all businesses patronized by visiting tourists. It also affects local business transactions that occur all year long by those who earn their living from tourism-dependent businesses.

There is no question that the economic damage of a drawdown is much more far-reaching and devastating to local businesses and these communities' economic foundations than is recognized by the draft EIS.

The total economic impact of a drawdown and sound science, not best guesses, must guide the final decision on a Banks Lake drawdown action. And the conclusion is clear: Banks Lake should not be drawn down.

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COMMENT CO 02



Washington State Legislature

April 11, 2003

Jim Blanchard
Special Projects Officer
US Bureau of Reclamation
32 C Street, Box 815
Ephrata, WA 98823

Dear Mr. Blanchard,

We are writing to express our staunch opposition to the proposed release of 130,000 acre-feet of water from Banks Lake into the Columbia River. To do this late in the summer would dramatically impact the agricultural industries in the Columbia Basin.

Washington State does not have a water problem; it has a water storage problem. By taking water intended for agricultural use, you will inflict irreparable harm to the agricultural industry. Our farmers depend on this supply to get them through the dry times, such as this year.

The potential devastation to the economies of Columbia Basin communities is very real. Take the Potato industry for example. The total economic impact of the potato industry on the Washington economy is estimated to be \$3.014 Billion. In the Columbia Basin roughly 12% of all sales result from potato production and processing and generates about 1 in 11 jobs in the region.

But the lake has other benefits to the community as well. Due to the existence of Banks Lake, Coulee City and the surrounding areas have placed a major emphasis on recreation, a livelihood that would drastically be threatened.

In 1998, the Salmon Recovery Act established the Independent Science Panel which would perform an assessment of the most pressing needs faced by our state. This panel is supposed to submit their findings to the Governor by April 15, 2003. Making this decision before the Independent Science Panel has been able to recommend appropriate implementations not only makes the proposed draw down premature, *but potentially unnecessary.*

On behalf of the individuals, families, and business that we represent, we ask that you do not move ahead with this Alternative Action draw down plan. Please keep our offices informed of your final decisions.

In Your Service,

Joyce Mulliken

State Senator
(360) 786-7624

Janéa Holmquist

State Representative
(360) 786-7932

Bill Hinkle

State Representative
(360) 786-7808

CC: Representative Doc Hastings
Senator Maria Cantwell
Senator Patty Murray

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State and Local Government Agencies — SL

COMMENT SL 01



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

4601 N. Monroe, Suite 202 • Spokane, Washington 99205-1295 • (509) 456-2926

April 1, 2003

Mr. Jim Blanchard
Special Projects Officer
Ephrata Field Office
Bureau of Reclamation
Box 815
Ephrata, WA 98823

Dear Mr. Blanchard:

Thank you for the opportunity to comment on the draft environmental impact statement for the Banks Lake Drawdown. The following comments are presented after reviewing the EIS prepared by the U.S. Bureau of Reclamation, examining potential environmental impacts from a proposed annual drawdown of Banks Lake to supplement late summer flows in the Columbia River, to enhance migration of anadromous salmon smolts and adults. The drawdown is proposed in accordance with the Biological Opinion released by NMFS (now NOAA Fisheries) in December 2000.

Banks Lake lies primarily within Grant County, but also Douglas County and the municipalities of Coulee City and Electric City, which operate boat launches and marinas, as do the state agencies, Washington Department of Fish and Wildlife (WDFW) and Washington State Parks and Recreation Commission (SPRC).

Water Quality

The Draft EIS evaluates impacts to water quality on Banks Lake but does not sufficiently evaluate potential water quality impacts to the Columbia River mainstem below Grand Coulee Dam, Banks Lake, nor the watershed below Banks Lake. In general, potential impacts to water quality need to be more thoroughly investigated before we can lend our full support to the proposal.

Columbia River –

In theory, Banks Lake drawdown early uniform and late scenarios would uphold Clean Water Act goals in providing better flows for juvenile migrating salmon in August and early September. In terms of Columbia River mainstem water quality, our program should lend support these efforts provided that:

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Mr. Jim Blanchard
4/1/2003
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- The increased flows can be shown not cause increases in gas supersaturation above water quality standards.
- The increased flows do not cause increases in temperatures above water quality standards. If these flows are shown to actually have the potential to decrease water quality standards violations for this time of year, our support for this proposal would be strengthened.
- The increased flows can be shown to not increase peaking at the powerhouses, especially at Priest Rapids Dam. The discussion of the cost of replacing power loss by each dam could be clearer. It would seem that there is no net loss of water available to generate hydropower and so the economic exercise is based on speculation of power rates at different times of the year.

Banks Lake –

The operation proposed involves decreasing the diversion from Lake FDR to Banks, so that irrigation releases provide drawdown. The EIS claims that irrigation releases are from the bottom and generally stay cool.

The overall effect of the drawdown described is to increase the average heating of Banks Lake due to the smaller volume of water subject to a fairly constant solar heating. The different draw down scenarios would put differing amounts of cool Lake FDR water into Banks, which would at least partially offset the increased heating. However, information about how Banks Lake functions with regard to hydrology and temperature is fairly limited. The analysis appears to be qualitative. We recommend that comprehensive monitoring and modeling effort be undertaken to better understand the hydrologic and temperature regimes in the lake as a function of Lake FDR pumping, lake elevation, and irrigation releases. This will not only benefit the better understanding of the drawdown program, but it will provide information for implementation of the Columbia mainstem temperature TMDL and for addressing temperature listings in the CBIP.

The EIS states: "Dissolved gasses would change very slightly because the ability of water to keep dissolved gas is inversely proportional to the temperature of the water. This means that dissolved gas concentration would be less as the water temperatures increased." This statement is misleading. As temperature rises the saturation concentration drops which results in an increase in percent saturation for a fixed mass of dissolved gas. Water pumped into Banks Lake may be supersaturated with gas from upstream. There is the possibility that temperature increases in Banks Lake could make this condition worse. It is unclear if the fate of dissolved gas into Banks Lake has been studied. This is an area that may merit some additional study.

This comment from the EIS raises another issue: dissolved oxygen (DO). If temperatures in Banks Lake are warmer, DO concentrations may be lower, especially if combined with low DO from algal respiration. Little information is provided about DO and algal productivity in Banks Lake. This may be another area that needs further study.

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Mr. Jim Blanchard
4/1/2003
Page 4 of 6

and the Banks Lake RMP should be amended appropriately, if necessary, so that shoreline riparian vegetation establishment is ecological rehabilitation using genetically and ecologically appropriate plant materials and species.

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Mitigation for impacts to public access and recreation should focus on enhancing boating access through lengthening ramps and possibly some limited navigational dredging, and should not result in further degrading shoreline riparian and upland shrub-steppe plant communities. Measures should be developed and implemented, to insure that the 56 informal campsites inventoried in 1998 (page 3-39) do not shift or extend as a result of August drawdowns, increasing damage to the shoreline riparian and upland environments. These measures should be adopted into the Banks Lake RMP (page 4-43).

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Uncoordinated and piecemeal responses to mitigate impacts from the drawdowns are likely at the various public and private marina, boat launch, camping and resort facilities up and down the lake; unless a coordinated planning effort is undertaken. This planning effort, including private concessionaires, private property owners, recreationists, appropriate state and federal agencies, and local governments of Douglas and Grant counties, the municipalities of Coulee City and Electric City, tribal entities, and other stakeholders should be made a priority as part of the selected alternative.

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Protecting cultural and historic resources and aesthetics is also a defined purpose of the Shoreline Management Act (RCW 90.58.020, and RCW 90.58.100[2][g]), consistent with their analysis in this EIS. The proposed alternative and mitigation efforts should be consistent with the SMA and Douglas and Grant counties' SMPs with regard to protecting cultural and historic resources at Banks Lake.

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Wetlands

Chapter 3 Un-vegetated flats are described as "providing good habitat for many species of fish." However, citations make the case that vegetated substrate is up to 10 times as productive. Are these un-vegetated flats the result of the current "upper zone" drawdown?

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Bureau of Reclamation should contrast the two zones. The upper zone as described above, and as observed anecdotally by us on 2-12-03, appears without submergent macrophyte vegetation. What is the condition of the "lower" zone as compared to the upper? This may help forecast the effect of a greater drawdown.

Conversely, a drawdown in late summer, during the growing season may be positive for emergent plants such as bulrush and even willow. Both can survive deeper inundations if they are allowed a period of drying later during the growing season prior to winter senescence. Exposing wetland bottom substrate to air often results in improved productivity due to higher oxygen levels, improved nitrogen recycling, increased root and rhizome growth, and a new seedbed available just prior to seed fall. This is often termed

Mr. Jim Blanchard
4/1/2003
Page 5 of 6

the "moist soil" response. It is illustrated in Table 3-1 where several species are noted to prefer a measured drying period during the late growing season. However, the ability of emergent plants to exploit the drawdown may be most dependant on its duration.

Extending the drawdown into September may be beneficial to emergent vegetation. What is the reason for the September 10 refill date? In some paragraphs it is termed "required" and in others "desired". A second factor is the substrate. If it is primarily sand then rapid drying is to be expected with little potential for vegetation growth, and even loss of that presently existing, due to rapid desiccation. A description of the substrate in the principle areas to be effected may help this discussion. We also suggest you implement testing of techniques to enhance wetland/riparian vegetation establishment under any Action Alternative as a mitigation measure.

Cottonwood trees are clearly an important, but rare, part of the ecosystem here. Is there a reason they are not common in areas that appear as potential habitat? Could their population be enhanced as a mitigation measure for an Action Alternative? For example, erosion is cited as being a limiting factor. Most wetlands supporting cottonwoods are in broad shallow bays. It may be that establishing low tech log boom breakwaters may have merit.

Is there an understanding of the direction and trend of the willow/cottonwood community on the lake? That is, is it decreasing or increasing, and why? Could drawdown be used to increase their coverage? Expanding their coverage should be considered as mitigation under any Action Alternative.

Chapter 4 Vegetation: You split measures of impact into 2 groups: 1) aquatic emergent, and 2) riparian. There needs to be a third group, that of aquatic submergent.

Preferred Alternative

If an Action Alternative is chosen we suggest the Uniform Draft be selected. In this way the biota may be able to better adapt versus a more rapid change in habitat. The hydrograph for this alternative may more closely emulate the shape of a natural curve.

Suggested Mitigation

If an Action Alternative is selected consider the following as part of a mitigation obligation:

1. Monitoring -
 - i. Map and contrast the wetland/riparian habitat more accurately then provided for by the National Wetlands Inventory (NWI). Stratify as to 3 zones: i. above 1570'MSL, ii. 1570-1565, and iii. 1560-1565.
 - ii. Document changes and trends under any alternative.
2. Habitat Mitigation -
 - i. From Monitoring locate cottonwood communities, and identify limiting factors, for enhancement and expansion potential.

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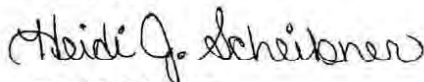
Mr. Jim Blanchard
4/1/2003
Page 6 of 6

- ii. Assess In-Kind Off-Site habitat compensation potential of restoration of weedy abandoned farm fields in Northrup Canyon. An agricultural drainage ditch is evident which could be plugged to restore wetland hydrology. The fields are currently dominated by non-native grasses and weeds. Restoration to potential presettlement condition of Palustrine Forested or Riparian wetland habitat types may well benefit Olive-sided flycatchers and sharptailed grouse, two local species of concern as discussed in the DEIS.
- iii. Assess Out-of-Kind On-Site habitat compensation potential of restoration of extensive wheat field agriculture within/adjacent to Steam Boat Rock State Park to native shrub steppe to assist in recovery of pygmy rabbit and Columbian sharptailed grouse, as well as the larger component of local species of concern. There is little sagebrush-dominated shrub steppe remaining on deep soils such as these being farmed to provide goose hunting. Wheat fields are not in limited supply on a local, regional or state area basis.
- iv. Assess Out-of-Kind On-Site habitat compensation potential of restoration and enhancement of existing shrub steppe by closing highly eroded dirt roads on the east shore flats, as represented by Million Mile areas north and south, as well as other sites. These areas are not so large as to preclude human use by walking.

16

If you have any questions on the Water Quality comments, please contact Chris Maynard at 360/407-6484 or Paul Pickett at 360/407-6882. If you have any questions on the Shorelands comments, please contact Doug Pineo at 509/329-3416. If you have any questions on the Wetlands comments, please contact Chris Merker at 509/329-3528.

Sincerely,



Heidi J. Scheibner
SEPA Coordinator

2003-0411

COMMENT SL 02

From: "FLORENCE Caplow" <florence.caplow@wadnr.gov>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Mar 12, 2003 6:57PM
Subject: Banks Lake drawdown comments

I am the botanist for the Washington Natural Heritage Program, Department of Natural Resources. We are the program that develops the state "endangered, threatened, and sensitive" rare plant lists, and we work closely with the USFWS on federally listed species.

01

I would like to point out that Table 4.4 refers to "State species of concern". Actually, the plants species in Table 4.4 are FEDERAL species of concern. There are a number of species of state wide importance that occur near Banks Lake, though only one occurs directly within the project area. These have not been addressed in your draft EIS.

Thank you,

Florence Caplow

Botanist

Washington Natural Heritage Program

Department of Natural Resources

P.O. Box 47014

Olympia, WA 98504-7014

Florence.Caplow@wadnr.gov

360-902-1793, FAX 360-902-1789

COMMENT SL 03



WASHINGTON STATE POTATO COMMISSION
108 INTERLAKE ROAD, MOSES LAKE, WA 98837
PH: 509-765-8845 • FAX: 509-765-4853 • WWW.POTATOES.COM

April 10, 2003

Mr. Jim Blanchard
Ephrata Field Office
U.S. Bureau of Reclamation
Box 815
Ephrata, WA 98823

Mr. John Keys
Commissioner, USBR
1849 C St. NW
Washington, D.C. 20240-0001

RE: **WSPC COMMENTS CONCERNING USBR'S BANKS LAKE DRAWDOWN PROPOSAL AND DRAFT ENVIRONMENTAL IMPACT STATEMENT**

Dear Mr. Blanchard and Commissioner Keys:

These comments are offered by the Washington State Potato Commission (WSPC) concerning the United States Bureau of Reclamation's (USBR) proposal to draw down Banks Lake in the Columbia Basin of Washington State.

The WSPC is a quasi state agency dedicated to the advancement of potato farming in Washington State. The WSPC works with approximately 350 potato growers throughout Washington. Potatoes are the second largest crop grown in the state, with an annual farmgate value of approximately \$500 million. Washington State accounts for nearly one-third of all potatoes and potato products exported from the U.S., totaling nearly \$500 million in exports from the Ports of Seattle, Portland, and Tacoma in 2001 alone.

A recent study of the economic impacts of the Washington State potato industry show that potato farming and related processing contributes \$3.01 billion annually to the Washington economy. (David Holland & Hun Ho Yeo, *The Economic Impact of the Potato Industry in Washington State*, 1997). This translates into nearly 28,000 jobs. As the Columbia Basin project accounts for nearly 85% of the potatoes grown in Washington State, most of the jobs created by Washington State potato industry reside in the Columbia Basin area. (*Id.*) This is significant considering that many counties in rural Eastern Washington have some of the highest unemployment rates in the nation. (See U.S. Dep't of Labor, Bureau of Labor Statistics, September 2002, <http://www.bls.gov/web/launstrk.htm>.)

Currently the financial health of the Washington potato industry is precarious. During the past five years, selling prices for potatoes have been very low, margins are tight, credit is scarce, and losses are mounting for many Washington potato farmers. Potential shortages of water and/or restrictions on irrigation, which could result from the USBR's proposal to drawdown Banks Lake, are of particular concern to the potato growers of Washington State and could have a devastating impact to the entire Washington potato industry.

Based on our review of the USBR's proposed action alternative and Draft EIS for the Banks Lake drawdown, the WSPC opposes both ("No Action" and "Action") alternatives presented. The WSPC urges the USBR to maintain its historic operations of the project—for the August period—with Banks Lake reservoir operations predominantly held within the 1567-1569 ft. elevations.

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BRIEF EXECUTIVE SUMMARY OF WSPC COMMENTS

In summary, the WSPC will demonstrate in the following comments that the USBR (in its Banks Lake Drawdown proposal and its related Draft EIS) has:

- Overstated the operating level of Banks Lake;
- Exaggerated the impact of the proposed drawdown on hydropower generation;
- Not adequately considered scientific data which shows flow targets for ESA listed fish cannot be met under the proposed drawdown;
- Failed to show any measurable impact of the proposed drawdown to ESA listed fish;
- Understated the negative impact of the proposed drawdown on the Banks Lake ecosystem; and
- Failed to consider other reasonable alternatives.

USBR OVERSTATES THE OPERATING LEVEL OF BANKS LAKE

The Draft EIS's presentation of the "No Action" alternative fails to deal adequately with a clear definition of baseline conditions. This leads to a misrepresentation of the baseline conditions under the "No Action" alternative and likely leads to inappropriate operational assumptions that affect the review of the "Action" alternative.

The EIS stipulates that "Historically, the most likely operating range was between 1,567 feet and 1,569 feet."¹ But the "No Action" alternative—and key alternative analysis and impacts—depicts a baseline condition where the elevation starts at 1,570 feet and declines to 1,565 ft. (the "no draft" sub-set of this alternative is recognized). In effect, alternative operations start at 1,570 ft., but the actual baseline condition for no action resides within elevations 1,567 ft. to 1,569 ft.

The end effect of the DEIS baseline for no action is to exaggerate the alternative's impact. If the baseline is assumed to be 1,570 ft., then the "No Action" alternative produces some measurable flow and hydropower generation impacts²; whereas the actual baseline conditions would have almost no effect on either existing flow or hydropower generation.

It appears as though the USBR is attempting to convince a decision-maker or regional audience that some marginally important impact to flows/hydropower exists under the "No Action" alternative, when in fact very little would occur from the historical baseline condition. Further, this may appear to make the "No Action" alternative more attractive than the "Action" alternative, given that the "Action" alternative carries with it more negative impacts, other than simply providing an additional (very small) increment of flow augmentation in August.

Procedurally, the USBR's handling of the "No Action" or baseline alternative appears to be flawed, and it is unlikely that the current depiction of baseline conditions would be in compliance with Council of Environmental Quality (CEQ) Regulations for EIS preparation.³

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¹ USBR. 2003. Banks Lake Drawdown, Draft Environmental Impact Statement. USBR, PNW Region, Upper Columbia Area Office, Ephrata, Washington, January 2003, page 4-28. Cited hereafter as Banks Lake DEIS.

² As well as changes the "No Action" alternative's relationship to the "Action" alternative.

³ Council on Environmental Quality Regulations for Implementing NEPA (Part 1502-Environmental Impact Statement.) Sec. 1502.4 Major Federal actions requiring the preparation of environmental impact statements. (i) Agencies shall make sure the proposal which is the subject of an environmental impact statement is properly defined.

USBR EXAGGERATES IMPACT OF DRAWDOWN ON HYDROPOWER GENERATION

04

Further concerning the issue of baseline conditions, the hydropower production analysis is confusing,⁴ and the No Action impact overstates the benefits of actual baseline conditions.

Under the analysis and assumptions provided, it would be inappropriate to include avoided costs for pumping as a benefit under the No Action alternative in Table 4-5, and only the incremental impacts of the Action alternative should be considered in Table 4-6. Stated differently, USBR's version of the No Action alternative should reflect only the increased power generation from 1,570 ft. to 1,565 ft. (85,000 MWh), and the Action alternative should only include the incremental, down-river power generation from 1,565 ft. to 1,560 ft. (85,000 MWh) minus the refill pumping (33,000 MWh) minus the Sept. power loss for refill (93,000 MWh). The end result would be a net power loss from the No Action to Action alternative of 41,000 MWh.

Still because the No Action alternative does not reflect actual baseline conditions, the change from the No Action to Action alternative is misrepresented. The real, incremental impact of the Action alternative is not accurately presented within the EIS.

NMFS FLOW TARGETS FOR ESA LISTED FISH CANNOT BE MET

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Although the DEIS identifies in Appendix C (Hydrologic Report) that the NMFS Flow Target (195,000 cfs at McNary Dam, as used within the DEIS analysis) "is significantly higher than the historic average flows and increasing the addition of 2-8 kcfs will not significantly increase the probability of meeting the BiOp flow objective at McNary,"⁵ the DEIS does not provide for adequate discussion and review of this factor. If anything, the main section of the DEIS is actually misleading on this fundamental point.

Under the "Purpose of" and "Need for Action" section of the DEIS, it is stated that "The purpose of the proposed action is to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed salmonid stocks..."⁶ In reality, the flow target cannot be met either during an average water-year condition during August or during low water-year conditions during the spring and summer periods.

A comprehensive technical review of the NMFS flow targets⁷ has been highly critical of the targets for failure to address the hydrological conditions of the Columbia River Basin system. It is noted that the flow targets cannot be met during the month of August (monthly average) under average water-year conditions, either with or without existing water withdrawals from the system; and the flow targets cannot be met during the full spring and summer periods under low water-year conditions, either with or without existing water withdrawals from the system. In effect, the NMFS flow targets have no basis whatsoever in empirical hydrology of the river system.

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Moreover, because the real baseline condition (1,567-1,569 ft.) of the No Action alternative is about half of the effect of a drawdown to 1,565, the amount of incremental flow actually contributed during the month of August would be about 1 kcfs (1,000 cfs) rather than 2 kcfs. This amounts to well under a 1% incremental increase in flows during average water-year conditions and about a 1.3% increase in flows during a low water-year condition like 2001. Pragmatically, such small, incremental changes in flow are imperceptible within the Columbia River measured at McNary Dam.

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⁴ Banks Lake DEIS, pages 4-21—4-23.

⁵ Bank Lake DEIS, Appendix C, Page 5.

⁶ Banks Lake DEIS, pg. 1-1.

⁷ D. Olsen, J. Anderson, J. Pizzimenti, et al., Review of the NMFS Flow Targets/Augmentation Program, Pacific Northwest Project, 1998.

USBR FAILS TO SHOW ANY MEASURABLE IMPACT OF DRAWDOWN TO ESA LISTED FISH

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The DEIS totally fails to identify the direct biological impacts (benefits) to ESA-listed fish runs relative to either the No Action or Action alternatives. This lack of basic information and analysis within the DEIS probably violates CEQ Regulations.⁸

The DEIS simply defers to the NMFS flow targets and RPA 31 as the justification for biological benefits, rather than clearly identifying the likely empirical impacts (benefits). The DEIS does not even describe any biological benefits that may be contained within the NMFS 2000 BiOp, relative to either the No Action or Action alternatives.

The DEIS has not reviewed, nor incorporated, recent technical analyses highly pertinent to this proposed drawdown action. These analyses are summarized below and copies submitted to the USBR with this comment letter.

Submitted to the Northwest Power Planning Council and the federal hydro system managers (BPA, USBR, Corps, and NMFS) in 1998, the "Flow Targets/Augmentation Program Review"⁹ evaluated the flow-survival relationship in detail and concluded that no survival benefits could be observed for spring migrants, and very limited benefits could be detected for summer migrants within the Lower Snake River. And what benefits did emerge were not the result of flow-augmentation per se, but the influence of temperature regulation caused by deep water releases from Dworshak Reservoir.¹⁰

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Analyses included in recent litigation and submitted to the Northwest Power Planning Council as part of its mainstem hydro operations review succinctly clarify the results of UW modeling analyses for flow-survival relationships, for the mainstem Columbia River.¹¹ The modeling covered average (2000) and low (2001) water-year conditions, with proportional water withdrawals from the Mid-Columbia region to John Day Pool, thus emulating the type of impact that would occur from an action such as the Banks Lake Drawdown (with and without conditions). Assuming a 1,000 cfs impact—an amount of water roughly equivalent to the 1,570 ft. to 1,565 ft. alternative—the net change to migrating fall Chinook survival is estimated to be .03%. From an empirical basis, .03% change in survival is not measurable. From an actual (historical) baseline change to 1,565 ft., the impact would be even less.

Other detailed analyses of the flow survival relationship prepared by the Columbia Basin Research Office, University of Washington, further elaborate on the lack of any significant relationship between flow augmentation and migration survival.¹² This research analyzes the past decade of flow-survival data for the mainstem Columbia River system, as well as technical studies conducted by NMFS and other agencies.

⁸ See CEQ Regulations for Implementing NEPA: Secs. 1502.14, 1502.16, and 1502.24.

⁹ D. Olsen, J. Anderson, J. Pizzimenti, et al., Review of the NMFS Flow Targets/Augmentation Program, Pacific Northwest Project, 1998. Report authors are affiliated with Pacific Northwest Project, University of Washington, and HARZA Engineering, respectively.

¹⁰ This observation also was made by the Northwest Power Planning Council's Independent Consultant in a 2002 report on mainstem river operations and management (see report at the Council's web-site).

¹¹ Technical Memorandum from Darryl Olsen, Ph.D., to Larry Cassidy, Chairman, Northwest Power Planning Council, Technical Analyses of Mainstem Water Withdrawals—Salmon Survival Impacts on the Columbia River, July 30, 2002. Memorandum includes recent UW Columbia Basin Research Office modeling runs for fall Chinook impacts on the mainstem Columbia River.

¹² The key research papers include: J. Anderson, The Flow-Survival Relationship and Flow Augmentation Policy in the Columbia River Basin, Columbia Basin Research, University of Washington, September 2002; J. Anderson, Supplement to The Flow-Survival Relationship and Flow Augmentation Policy in the Columbia River Basin, Analysis of New Results, Columbia Basin Research, University of Washington, November 2002; and J. Anderson, Response to the ISAB Review of Flow Augmentation: Update and Clarification (February 2003), Columbia Basin Research, University of Washington, February 2003, and papers cited therein.

From this research, it is concluded that no measurable survival benefits can be observed for spring migrants; and for summer migrants, any relationship is dependent upon significant temperature differentials that are not affected by small to moderate changes to flow regimes. The two most significant variables affecting survival are temperature shifts—such as that occurring in the Snake River under 2001 water-year conditions—and the total distance traveled (not travel time) by juvenile migrants.

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The implications of the above analyses applied to the question of mainstem survival benefits resulting from a Banks Lake drawdown is straightforward: there would be no measurable, or empirically documented, benefits from such an action.

USBR UNDERSTATES THE NEGATIVE IMPACT OF A DRAWDOWN ON THE BANKS LAKE ECOSYSTEM

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A review of the Environmental Consequences of drawing down Banks Lake (Chapter 4) shows the EIS lacks adequate data and analysis to verify many of its conclusions. Many of the conclusions in (Chapter 4) simply do not match the information provided in the Environmental Affects, Chapter 3. This Chapter documents the potential impacts from reservoir drawdowns from the scientific literature and the conditions known to occur around Banks Lake. The conclusions that impacts to biota in and around Banks Lake would be minor are highly speculative and overly optimistic. They rely on generalizations for which little or no data are presented, including some that seem to contradict simple logic. For example, the EIS states that the impacts to dewatering aquatic and emergent vegetation would be mitigated by potentially moist conditions and cool temperatures in August. No data are presented on those conditions or the likelihood that the specific organisms in question could withstand the average or extremes historically known in the area. The following specific comments provide further detail.

It would be reasonable to estimate the total number of acres of littoral zone that will be subject to desiccation by drawdown. No estimates are provided. Such an estimate could also be expressed as a percentage of the habitat this zone represents in Banks Lake. Based on the descriptions of the shallow nature of much of the lake, and the distances that boat ramps would be exposed, it suggests that a large percentage of the productivity zone would be exposed and desiccated.

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The EIS states that the impact from desiccation to the dewatered vegetation is mitigated by the potential for mild temperatures and moisture (rainfall) in August. No weather data were provided. The EIS also stated that the growing season is nearly over in August. It is not clear what vegetation the USBR is referring when it says that August is the end of the growing season. Native terrestrial vegetation may be reduced during winter after killing frosts occur, but these conditions are probably at least two or more months away from drawdown in most years. The aquatic and emergent plants would continue to provide cover and food for at least as long due to the buffering affect of water. Such aquatic and terrestrial vegetation provides important energy that enable animal populations to get through the winter. Reducing or eliminating much of the vegetation months ahead of the natural die-off may not be minor for populations in the riparian or littoral zones of Banks Lake.

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Weather conditions at Banks Lake are generally hot and dry in August and would lead to lethal conditions for the most of the aquatic vegetation and the microscopic animals that would be dewatered in a drawdown. The premature die-off in warm weather would likely lead to significant organic decay, oxidation and impact to water quality. This decay would exacerbate declining water quality that would accompany the warming conditions the EIS predicts in the smaller reservoir volume. Little water quality data were presented, however water temperatures were noted to exceed 80F in the shallows of Banks Lake. Such warm water coupled with decaying vegetation would likely result in low dissolved oxygen. The low dissolved oxygen would likely violate state water quality standards for the uses of Banks Lake. Low DO and warmer water would impact the species most prized in the Lake (cold water salmonids) and lead to increases in species least desired, such as bull head and carp, which are tolerant to high temperatures and low dissolved oxygen. Such potential is not discussed in the EIS.

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Some of the more drought resistant emergent vegetation would be spared. However, by the data presented, the most valuable plants and native vegetation would largely be killed and the least desired species, mostly exotics, would thrive. For emergent vegetation, the exotic reed canary grass would probably thrive, as would cattails. Both are considered of low value to wildlife, although conflicting information is presented on cattails between Chapters 3 and 4.

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For riparian vegetation, the EIS indicates that except for the exotic Russian olive, the other native woody plants would likely suffer further population impact. Although mature woody plants might "withstand" brief periods of drought, seedlings with shallow roots would not fare as well. The EIS points out that one of the more valuable riparian species, black cottonwood, already has little recruitment. Thus, if any recruitment does occur, the drawdowns would likely eliminate any small chance for long term stability of this tree species.

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The further degradation of woody plants and trees could affect terrestrial species such as eagles and hawks. An immediate affect of drawdown would distance the perches used by birds further away from the reservoir. Perches are often used for hunting purposes by raptors including eagles. Thus even though larger trees might not be immediately killed by temporary changes in the freatic zone, birds might abandon these trees as no longer suitable feeding habitat in the short term. Should any contain nests, this could have a more dramatic long-term effect. No data were provided that assured that a continuing practice of annual drawdown would not affect the health of even mature trees; and it would most likely to affect seedling and understory vegetation that have much shallower root systems and would be less drought tolerant. The EIS instead speculated on soil characteristics and their potential to hold moisture. No data on soils were provided.

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In summary, the EIS generalizes that drawdown impacts on the biota in and near the Lake will be minor because drawdowns will be within the "legally" mandated five-foot pool elevations and only be temporary. The plants and animals of the littoral and riparian zones do not respond to the legal limits of drawdown and many of them cannot live without water even temporarily. Many of these species have direct and important value to recreational use or have tribal value in the region. A number of them fall into the category of "species of special concern". The toehold that many of these species have in the basin is already tenuous due to the extensive development and changes that have occurred in the past. Those populations that remain have adapted to conditions in Banks Lake which for the most part includes a stable pool elevation limited to infrequent fluctuations of about two feet. Raising the pool above this level, then dropping it five feet in a matter of days will have significant changes in the physical environments of the littoral and riparian zones around Banks Lake. They will not likely be minor in terms of their affect on biota. Such changes were not well documented with data or modeled with any rigor in the EIS.

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Due to the complex fish fauna, it is difficult to predict the interactions that are likely to occur in Banks Lake. No assessment of species importance is provided. The impact assessment is reduced to a one-dimensional discussion of potential predator-prey interaction of adult fish and juvenile fish. It is not predictive or even speculative of how the existing fish and riparian populations of Banks Lake will ultimately change. It does not document what the population levels are in any approximation to one another, much less what they will be in the future. When Lower Granite Reservoir was dropped for only a few days in a test of drawdown in 1992, enormous changes occurred in the feeding ecology of smallmouth bass there. Crayfish populations were largely killed and smallmouth bass switched from this species to salmon smolts as a primary food (Dave Bennett, U. Idaho, personal communication). This was the exact opposite of what was the drawdown was predicated to do (enhance salmon survival). It is nearly impossible to predict the changes in complex biological communities. It is a certainty that there will be measurable physical changes to water quality and riparian and littoral zone habitats in Banks Lake if regular drawdowns occur. And these will lead to changes in the biota of the Lake just as surely as dewatering the boat ramps on the lake will affect the recreational usage. The organisms in Banks Lake littoral and riparian habitats are not, for the most part, visitors. They live there permanently and cannot move to another Lake. These unpredictable changes and losses are being traded for a potential alternative benefit to salmon. The biological data are clear both in Banks Lake and the Columbia River. Drawing down Banks Lake will have definite and

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measurable changes to the physical and biotic conditions of the Lake and for the most part these will be negative. But it will have no measurable change in the biota of the Columbia.

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USBR FAILS TO CONSIDER OTHER REASONABLE ALTERNATIVES

The USBR's approach to the Banks Lake drawdown project purpose and need and the alternatives considered is improperly constrained as a choice between compliance with the Endangered Species Act ("ESA") through implementation of action 31 of the 2000 Federal Columbia River Power System ("FCRPS") BiOp reasonable and prudent alternative or no action to comply with the ESA.

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The purpose of the proposed action is to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed salmon stocks by altering the August drawdown of Banks Lake from elevation 1565 down to elevation 1560, to comply with Action 31 of the Reasonable and Prudent Alternatives of the Federal Columbia River Power System Biological Opinion, issued December 21, 2000.

DEIS p. S-1 (emphasis added). This framing of the purpose and need wrongly presumes that (1) an alternative course of action is needed because historic Banks Lake operations jeopardize the continued existence of listed salmonid species and/or adversely modify critical habitat; (2) flow objectives for the Columbia River at McNary Dam must be satisfied to prevent likely jeopardy or adverse modification of critical habitat; and (3) a Banks Lake drawdown in accordance with Action 31 will, in fact, increase the probability that flow objectives will be achieved to assure that listed species will not be jeopardized by the USBR's operations.

The technical comments and technical analysis offered above demonstrate that the Columbia River flow objectives cannot be scientifically justified and that Banks Lake operations, under existing conditions or under proposed modifications, have no positive or negative effect on likely jeopardy to ESA-listed salmonids or designated critical habitat. The USBR's decision-making and environmental analysis are fatally flawed by the unfounded premise that the agency's only decision-making choice is to implement action 31 "in compliance" with the 2000 FCRPS BiOp. Because of this unduly narrowed focus, the USBR fails to take a hard look at the broader purpose and need for implementing the 2000 BiOp reasonable and prudent alternative actions and a broader, reasonable range of alternatives for satisfying the objectives of the Columbia Basin Project while also complying with the ESA.

a. The Purpose and Need Are Too Narrow and Circular.

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The USBR has narrowly defined the purpose and need for action as implementation of RPA action 31 in the FCRPS 2000 BiOp. DEIS p. 1-1. The USBR's approach is circular and results in an unreasonably narrow range of alternatives – action or no action. In essence, the purpose of the action is the proposed action – RPA action 31. Stated differently, the USBR has proposed a single alternative action to current operations at Banks Lake because an alternative action has been advised by the National Marine Fisheries Service (NMFS). The USBR never asks why an alternative action has been advised by NMFS, whether NMFS' advice is justified, or whether there are other alternatives that would satisfy ESA requirements without implementing RPA action 31. Under NEPA, "an agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." Citizens Against Burlington, Inc. v. Busey, 938 F.2d 190, 196 (D.C. Cir. 1991) (cited with approval in City of Carmel-By-The-Sea v. United States Dept. of Transp., 123 F.3d 1142, 155 (9th Cir. 1997)). The purpose and need for the Banks Lake drawdown action is unreasonably narrow and is clearly designed to justify a foreordained action without serious or critical analysis by the USBR.

Because it is unreasonably narrow, the USBR's concept of purpose and need is offered without any acknowledgment of or integration with the broader purposes of the Columbia Basin Project, of which Banks Lake

is a component. 16 U.S.C. §§ 835-835m. According to USBR, the decision to be made is whether or not to implement the proposed action – action 31, but the purpose and need suggest that USBR has only examined how to implement action 31 without taking a hard look at the question why action 31 is needed for purposes of compliance with the ESA or how it is related to the program of over 100 actions "required" by the FCRPS BiOp. Indeed, the DEIS for the Banks Lake draw down is not tiered to a broader programmatic EIS for the USBR's program of actions under the FCRPS BiOp. The only NEPA document referenced by the DEIS is an environmental assessment (EA) for the Banks Lake Resource Management Plan (RMP) (2001). The Banks Lake RMP and EA do not provide a programmatic approach to decisions regarding implementation of the 2000 FCRPS BiOp. In fact, the RMP makes no reference to management for threatened and endangered fish species, and it explains that the fish flow requirements of the 2000 FCRPS BiOp are a given legal constraint on project operations that is not questioned or analyzed.

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The absence of a broader context for the proposed action strongly suggests that the USBR has violated NEPA by neglecting any effort to take a comprehensive and informed decision-making approach toward implementation of the FCRPS RPA actions. In fact, a biological opinion and incidental take statement are not exempt from NEPA and require compliance with NEPA when they are implemented as actions with a significant impact on the environment. Ramsey v. Kantor, 96 F.3d 434, 444 (9th Cir 1996). This requirement is not satisfied by an EIS to consider a single action that is part of the larger program of action under the FCRPS BiOp. In the absence of a programmatic analysis to which the single EIS is tiered, the USBR's narrow approach to NEPA compliance results in unlawful segmentation and an incomplete analysis that is inadequate for lawful decision making by the USBR.

b. USBR Has a Duty to Make An Independent Determination on What Agency Actions Are Authorized and Required for Compliance with the Endangered Species Act.

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As a matter of law, the authority and duties of the USBR are not narrowly constrained by the 2000 FCRPS BiOp. Consultation under the ESA does not empower NMFS to simply dictate the actions undertaken by the consulting federal agency through the Section 7 process. Westlands Water Dist., 2002 U.S. Dist. LEXIS 25905 *172-73 (E.D. Cal. Dec. 10, 2002) (NMFS acted in excess of authority when it required the proposed action as a reasonable and prudent measure to minimize take). The implementation of any action remains within the discretion and control of the action agency – here, the USBR.

Following the issuance of a biological opinion, the Federal agency shall determine whether and in what manner to proceed with the action in light of its section 7 obligations and the Service's biological opinion. 50 C.F.R. § 402.15(a) (2001). When the Section 7 consultation regulations were finalized, NMFS described the biological opinions as "advisory" documents:

One commenter questioned the ultimate authority of the Service to issue binding procedural regulations under section 7. In no way does the Service intend to use the consultation procedures of section 7 to establish substantive policy for Federal agencies. The Service performs strictly an advisory function under section 7 by consulting with other Federal agencies to identify and help resolve conflicts between listed species and their critical habitat and proposed actions. As part of its role, the Service issues biological opinions to assist the Federal agencies in conforming their proposed actions to the requirements of section 7. However, *the Federal agency makes the ultimate decision as to whether its proposed action will satisfy the requirements of section 7(a)(2)*. The Service recognizes that the Federal agency has the primary responsibility for implementing section 7's substantive command, and the final rule does not usurp that function. The Service is satisfied that the final rule is within the scope of the authority provided in the Act.

51 Fed. Reg. 19926 (June 3, 1986) (emphasis added).

Federal agencies are not absolutely bound by the terms of a biological opinion. To the contrary, they are required to exercise independent judgment because they may not rely blindly on a biological opinion to justify their actions. *Resources Ltd. v. Robertson*, 35 F.3d 1300, 1304 (9th Cir. 1994) (an action agency's decision to rely on a biological opinion must not be arbitrary and capricious); *Pyramid Lake Paiute Tribe v. U.S. Dept. of the Navy*, 898 F.2d 1410, 1415 (9th Cir. 1999); *Stop H-3 Ass'n v. Dole*, 740 F.2d 1442, 1459 (9th Cir. 1984) (same); *Center for Biological Diversity v. Rumsfeld*, 198 F. Supp.2d 1139 (D. Ariz. 2002) (same). The USBR can and should consider the 2000 FCRPS biological opinion and may even rely on the opinion if it is valid, but the USBR still must exercise independent judgment on what actions are necessary or appropriate to comply with the requirements of the ESA.

Accordingly, the primary role of ESA Section 7 consultation is to require federal agencies to avail themselves of the opportunity to obtain expert information and advice on impacts to listed species before any activity they authorize, fund or carry out takes place. The ESA neither expands nor contracts the power given to any other federal agency; rather, agencies such as the USBR remain governed and obligated by their duties under their own enabling authorities. *Platte River Whooping Crane Critical Habitat Maintenance Trust v. Federal Energy Regulatory Commission*, 962 F. 2d 27, 34 (DC Cir. 1992). Because Action 31 in the 2000 FCRPS BiOp is not justified by scientific fact, the USBR has the discretion and the duty to reject RPA action 31 and continue historic operations. In the DEIS, the USBR fails to consider a reasonable range of alternatives because the Bureau defines the purpose and need based on an improper view of its own authority and discretion that rules out any action other than RPA Action 31.

CONCLUSION

The WSPC concludes that the USBR proposed drawdown actions ("No Action" and "Action" alternatives) would have no positive measurable impacts to the survival of migrating juvenile Columbia River salmon; and they would give false credence to the technically flawed flow targets currently within the NMFS 2000 BiOp. Conversely, such actions would negatively affect native or local ecological habitat and resources, could negatively affect on-site recreation resources (as discussed in the DEIS) and possibly hydropower production, and unlawfully encroach upon the statutory authorization for the project. The benefits are either very unclear or nonexistent, while the costs are apparent.

The WSPC believes that the above mentioned drawdown proposals are ill-conceived measures that should receive no further review or action. Furthermore, the WSPC urges that historical operating regimes at the Banks Lake Project be maintained.

Sincerely,



Pat Boss
Executive Director

cc: Washington State Potato Commissioners and Government Relations Committee Members
U.S. Senator Patty Murray
U.S. Senator Maria Cantwell
U.S. Representative Doc Hastings
U.S. Representative George Nethercutt
U.S. Representative Greg Walden

Enclosures

***The Columbia-Snake River
Flow Targets/Augmentation Program***

***A White Paper Review
With Recommendations for Decision Makers***

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Sponsored By:

**Columbia-Snake River Irrigators Association
Eastern Oregon Irrigators Association
Idaho Water Users Association
Northwest Irrigation Utilities
Washington State Water Resources Association**

February 1998

***The Columbia-Snake River
Flow Targets/Augmentation Program***

***A White Paper Review
With Recommendations For Decision Makers***

Executive Summary

1.0. A White Paper Review.

- This white paper examines the Columbia-Snake River flow targets/augmentation program, and its implications for important water management actions within the Pacific Northwest.
- Evaluations of hydrologic, biological, and economic data indicate that the existing NMFS water policy and flow targets/augmentation program needs to be reassessed and changed.

2.0. The Emerging NMFS Water Policy.

- Through its flow targets/augmentation program, the NMFS is developing a water policy within the Columbia River Basin drainage of "zero net loss."
- The NMFS policy calls for no further water withdrawals from the Columbia-Snake River mainstems, tributaries to the main river system, and related groundwater sources; and it directs federal and state agencies to review the impacts of existing water withdrawals on its flow targets program.
- The NMFS policy challenges state authority to grant *future* water rights for municipal, industrial, or irrigation uses. By calling for a "review" of existing water withdrawals, the policy postures toward challenging *existing* state-granted water rights.
- Under the NMFS water policy, future (new) water allocations from within the Columbia River Basin drainage are to be used solely for instream fish flows.

3.0. NMFS Water Policy Justification, Flow Targets and Augmentation.

- The NMFS flow targets/augmentation program follows on the development of the fish flow augmentation program devised by the Northwest Power Planning Council during the 1983-1994 period.
- An initial "water budget" requested by the Council amounted to about 3.75 million acre-feet (MAF), but has grown with the preparation of each new Council Fish and Wildlife Program; the NMFS 1995 BIOP now calls for as much as 13-16 MAF for dedicated flow enhancement.
- The highest level of flow augmentation produced about 10.6 MAF, occurred during the 1994 drought water-year; about 0.8 MAF was released from the Brownlee Project and above, about 1.9 MAF was released from Dworshak Reservoir, with the remaining water being released from upstream Columbia system reservoirs.
- In the 1994 low water-year, about 0.5 MAF was provided from the Brownlee Project and above during the *summer period*; and about 1.0 MAF came from Dworshak Reservoir.
- Within the NMFS flow augmentation program, the "flow targets" serve as operational guides for in-season water management, determining when to use available water for flow augmentation.

4.0. River System Hydro Regulation Studies and the Flow Targets.

- The USBR hydro regulation studies demonstrate that the NMFS flow targets cannot be met in all months (affecting seasonal averages), during low or average water-years, because they require more water than the hydrologic system can provide--with or without the effects of net irrigation depletions from the Snake-Columbia River Basin.
- During low and average water years for the summer flow augmentation period, the NMFS flow targets exceed water levels that would be available under natural river system conditions, with or without the effects of net irrigation withdrawals.
- During a drought year, net irrigation depletions represent large volumes of water for the months of July and August. But the net irrigation depletions *are not* the primary reason why the NMFS flow targets cannot be met; the problem rests with the flow targets themselves--the targets are well beyond the Basin's hydrologic capability.
- The annual natural run-off within the Basin is highly variable; the yearly net variation in flows for a 50-year water record substantially exceeds or overshadows net irrigation withdrawals, measured at McNary Dam.

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- Given the hydrological capabilities of the river system, the NMFS summer flow targets of 200 kcfs (Columbia River) and 50-55 kcfs (Snake River) cannot be met during low water conditions, even with the complete elimination of all irrigation depletions. Basin hydrology limits summer flows to well below the NMFS target level.

5.0. *Biological Basis for Flow Targets/Augmentation.*

- Largely based on historical data depicting year-to-year flow and juvenile fish survival relationships, it has been assumed that flow augmentation could be used to increase flows during low water-year conditions, in an attempt to produce survival rates observed in high water years.
- Data collected for spring migrants since 1992 (1993-1997 data sets) indicate that the *within year relationship* between different flow regimes and fish survival through the hydro system corridor is weak. This means that attempts to use flow augmentation to improve spring migrant survival will provide very little or limited benefits.
- The year-to-year correlations between flow and survival—reflecting vastly different flow levels between years—support the hypothesis that ecological factors associated with drought conditions are principally responsible for fish survival.
- The year-to-year observations move toward the conclusion that better water-year conditions, in general, provide for greater fish survival than drought conditions.
- The flow-survival data collected on fall chinook is more variable and less well defined than for spring migrants. Given the existing data, flow is one variable correlated with survival, in some cases, but it has less predictive capability than other variables (such as migration timing and fish size through the upper river system). Also, some relationships, such as observed numbers of marked fish detections between years, are inconsistent among years (although dam-smolt collection operations may have been different among years, making detection comparisons difficult).
- Snake River summer flow augmentation is being used to enhance the transportation collection efficiency for fall chinook. But flow augmentation is not the only method available to increase collection efficiency. Structural changes at the projects, such as the current installation of double-length screens and/or surface collector technology, may be able to achieve the same goal and provide benefits for spring migrants, as well.
- During the summer period, Lower Snake River water temperatures can and do exceed levels that negatively affect migrating juveniles and adults. The use of some flow augmentation (from Dworshak Reservoir) to improve migration conditions should continue to be reviewed; and the biological benefits and costs should be better understood.

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- Because of the uncertainty surrounding the effects of flow augmentation on overall fall chinook survival, it is difficult to support either an increase or decrease in the amount of storage currently being used for flow augmentation (1.5 MAF) to protect summer migrants, for a drought year like 1994. *But resource managers should be cautious in making conclusions about the benefits gained from this flow regime, because shaping flows within a drought year will not produce the benefits fish receive under a high water-year.*

6.0. *Economic Trade-offs of Flow Augmentation.*

- Using sport and commercial fisheries values and fish abundance estimates for the 1987-1991 period (relatively high catch period), the annual direct net value of the upriver (above Bonneville Dam) salmon and steelhead contributions to ocean and inriver fisheries is about \$25 million. It is acknowledged (and has been measured) that salmon do retain an existence value that exceeds their direct commercial or use value.
- Applying some favorable economic and biological assumptions to the benefits of flow augmentation, the annual direct net economic value of the upriver contributions to commercial and sport fisheries is about \$2.25 million per one million acre-feet of water used for flow augmentation--representing a *future value* estimate over 10 life-cycles (1995\$).
- Flow augmentation causes economic impacts to hydroelectric power operations and could create future economic impacts to irrigated agriculture. For one million acre-feet of flow augmentation, the cost to hydro power operations is estimated to be about \$8-10 million (BPA system costs). For Basin irrigated agriculture, the direct net value of one million acre-feet of water is estimated to be about \$40-70 million; one estimate for the Upper Snake River Basin suggests about \$49 million per one million acre-feet of water provided for flow augmentation (includes hydropower benefits).
- Both economic trade-off analyses and cost-effectiveness analyses strongly support the position that *any flow augmentation program should be optimized to maximize fish benefits for the costs incurred to other water resource sectors.*

7.0 *Recommendations for Decision Makers.*

7.1 *The NMFS Water Policy.*

- Decision makers should be fully aware of the emerging NMFS water policy and its implications for state water management.

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- The NMFS water policy—bred from the flow targets/augmentation program—directs that all future (new) water allocations from the Columbia River Basin drainage area should be used solely for fish protection.
 - The NMFS water policy is a single-purpose, resource use strategy that subjugates new water withdrawals for other types of social and economic activity or growth within the Basin. The policy is one-dimensional in nature, and it directly or indirectly challenges state legislative authority to govern water management.
 - The NMFS senior management, working with state water resource managers, should reevaluate and change this policy to better reach the needs of biological and economic optimization.

7.2 Review and Restructure the Flow Targets/Augmentation Program

- The existing data and analyses strongly suggest that the correlation between incremental flow increases and juvenile spring migrant survival is relatively inelastic, or that the survival benefits are small.
- The existing data suggest that estimated river system flow benefits—though limited—favor the fall chinook. But there is considerable uncertainty surrounding the effects of flow augmentation on overall survival. This includes factors related to direct inriver survival benefits, migration timing, inter-year detection differences, and the use of flow to increase transport collection efficiency.
- It is more clear that flow augmentation is a measure providing marginal survival benefits and has limited effectiveness as a recovery measure.
- In contrast to some of the biological impacts, the economic trade-offs of flow augmentation are more predictable. Flow augmentation does increase costs to the hydropower system, and it could create significant costs to the irrigation (and other) sectors.

Given the data and analyses presented within this paper, the following review and changes are suggested for the flow augmentation program.

Optimization Review:

- The flow targets/augmentation program would benefit from a detailed technical review that focuses on the *optimization of water use; its source, delivery timing, temperature effects, and a clear identification of the biological or physical attributes to be targeted. This also includes applying principles of cost-effectiveness, to compare the biological benefits gained for the costs incurred.*

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- The existing flow augmentation program does not optimize water use for either survival benefits (benefit per unit of flow) or economic costs (benefit per dollar cost) to the river system.

A flow augmentation program that better reflects a step toward optimization of the existing water resources is summarized below.

Low Water Conditions, Snake River System:

- For the summer period (July-August), provide for experimentation a *maximum of 0.5 MAF* from the Brownlee Project and above consistent with state law and obtained from willing sellers or lessors; and a *maximum of 1.0 MAF* from Dworshak to be used for fall chinook migration and/or adult temperature control. Data to review this experimental regime would be collected through 1999, consistent with the existing NMFS decision-making process.

Low Water Conditions, Columbia River System:

- Direct flow augmentation releases solely for the fall chinook migration. For the summer period (July-August), provide for experimentation *0-4.0 MAF*, as recommended jointly by federal and state fish and water resources managers.

Average Water Conditions, Snake River System:

- For the summer period (July-August), provide for experimentation a *maximum of 0.5 MAF* from the Brownlee Project and above consistent with state law and obtained from willing sellers or lessors; and a *maximum of 1.0 MAF* from Dworshak to be used for fall chinook migration and/or adult temperature control. Data to review this experimental regime would be collected through 1999, consistent with the existing NMFS decision-making process.

Average Water Conditions for the Columbia River System:

- Direct flow augmentation releases solely for the fall chinook migration. For the summer period (July-August), provide for experimentation *0-4.0 MAF*, as recommended jointly by federal and state fish and water resources managers.

The Restructured Flow Augmentation Program:

- The above restructuring of the flow augmentation program would have the greatest deviation from the existing program by eliminating the current spring flow augmentation regime.

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- During the summer period, the restructured program would limit flow augmentation in the Snake River Basin to a level not to exceed operations that occurred in the summer of 1994 (drought conditions).
 - Without a better technical justification for the summer flow augmentation, *resource managers should refrain from taking actions to increase this flow augmentation regime.*
 - It is equally important that adequate data be obtained and appropriate analyses undertaken in order to optimize and provide a supportable technical justification for the current summer flow augmentation program.

7.3. *Future Considerations for Flow Augmentation Management and Evaluations.*

It appears that using flow augmentation within a single season is not an effective recovery tool for spring chinook migration within the mainstem. What is less clear is whether mainstem flow augmentation is an effective management tool for fall chinook within the mainstem; or how flow augmentation can or should be used to improve survival within tributaries. Given these latter uncertainties and issues beyond the scope of this paper, the following recommendations are provided.

- In the case of Snake River fall chinook, the existing data on collection efficiency (FGE) and its relationship to flow is difficult to interpret. The need exists to establish data that verifies the interaction between flow augmentation and structural improvements to FGE, and cost-effectiveness analysis should be used to assess risk and economic trade-offs.
- Resource managers may want to give consideration to changing the focus of flow augmentation efforts away from mainstem actions to improving habitat conditions within some tributaries. The NMFS Recovery Plan should better recognize this factor by taking into account criteria for demonstrating real biological benefits, prioritizing major production tributaries, and measuring the cost-effectiveness and benefit-cost of tributary flow enhancement actions.
- *Direct actions to implement flow augmentation measures should defer to the existing authority of state water rights and should allow for "locally developed" solutions within specific watersheds.* This could include an implementation of efficiency measures, water transfers, and the development of new water storage projects to benefit both fish and economic interests.

***The Columbia-Snake River
Flow Targets/Augmentation Program***
***A White Paper Review
With Recommendations for Decision Makers***

1.0. A White Paper Review.

Intricate technical features underlying the Columbia-Snake River flow augmentation program have likely overwhelmed an ability of many regional decision makers or resource managers to track, much less to understand or fully appreciate. The flow augmentation program, its implementation, and its impacts are complex.

Making this complex technical and policy system more coherent or understandable is difficult, but one approach to doing so is through the preparation of a white paper. A white paper must deal relatively succinctly with several technical, management, and policy issues.

A white paper review should serve three important purposes for decision makers and resource managers. First, it should provide basic information about policies and program actions, clarifying where possible the key implications surrounding their implementation. Second, it should highlight the primary technical features that are an essential component of program actions, addressing their strengths or weaknesses. And third, a white paper should present clear recommendations for improving program actions; for example, by suggesting how resources used for action implementation can be made more effective or optimized.

This white paper covers many of the major hydrological, biological, and economic factors relevant to the flow targets/augmentation program.

2.0. The Emerging NMFS Water Policy.

Natural resources policies are usually the foundation for new programs or management actions—programs or actions are derived from policy formulation and establishing objectives. But in the case of the NMFS flow targets/augmentation program, it is the program that is driving the development of the "NMFS water policy," and the program is attempting to shape water policies for the Pacific Northwest states.

The "NMFS water policy" for the Columbia-Snake River Basin drainage area can be viewed from within three sources: 1) the NMFS (1995) Proposed Recovery Plan for Snake River Salmon; 2) a revised draft NMFS (1997a) Recovery Plan still in review and development; and 3) a NMFS (1997b) biological opinion (BIOP) issued as part of a recent consultation with the Corps of Engineers (Corps) concerning building a new irrigation pumping station along the Lower Columbia River.

The first two sources (NMFS 1995, 1997a) contain similar directives to federal and state agencies concerning the issuance of new water rights or permits:

In recent years, the states have placed moratoria on new water withdrawal permits from the Snake and Columbia Rivers. These moratoria should continue and the states should expand them to the tributaries and to those groundwater resources that are part of the Snake and Columbia River system. In addition, the BOR should not promote additional irrigation in the Columbia River Basin. The Corps and state water resource agencies should not allow new water withdrawal permits that result in a net loss of flow and should review existing water withdrawal permits that reduce [the] system's ability to meet flow objectives (NMFS 1997a, pg. 70).

NMFS further states that upstream water diversions from the Snake and Columbia River system are a major reason why instream flow objectives (targets) for fish cannot be met and cites the USBR (1997) report as documentation.

The NMFS water policy also seeks to extend federal regulatory control to cases where existing state water permits are being perfected. This is illustrated by the agency's biological opinion (NMFS 1997b) on the Inland Land Project, regarding a Corps permit for a new Columbia River pump station. Here the pump station permit applicant holds a state-granted water permit that is being perfected—the construction phase is commencing to put the water resource allowed under the state permit to beneficial use. In this circumstance, NMFS brings forth its "zero net impact" goal, calling for no further depletions from the river system and concluding that "issuance by the U.S. Army Corps of Engineers (Corps) of a permit to construct a pumping facility in the Columbia River would jeopardize the continued existence of listed Snake River salmon...and result in destruction or adverse modification of their critical habitat" (NMFS 1997b, pg. i-ii, 14). The NMFS

based its determination on the collective or cumulative effects of water withdrawals within the Columbia River Basin.

Within the Inland Land Project BIOP (NMFS 1997b), NMFS also instructed the Corps to pursue Section 7 (Endangered Species Act) conservation measures that included a review of all existing pump station permits, and to decide whether such permits should be candidates for further consultations with NMFS prior to spring 1999. And NMFS indicated that if the states of Oregon, Washington, and Idaho adopted comprehensive programs to address instream flow restrictions in the Columbia River Basin, then that action may alleviate NMFS' concerns about the cumulative effects of water withdrawals.

NMFS senior staff maintain that the "NMFS water policy" does not deny or restrict the issuance of new water permits (NMFS 1997c). From their perspective, any new development or water use could proceed forward by providing replacement flows for the water withdrawn, by engaging in conservation measures, or by accomplishing water right transfers through open water markets (NMFS 1997b, 1997c).

But essentially, the NMFS water policy seeks to discourage or eliminate any new (additional) water withdrawals for municipal, industrial, or irrigation development within the Columbia River Basin; and it appears to challenge directly or indirectly the legislative authority of states to regulate, manage, and allocate water rights. The NMFS water policy is pervasive and absolute in nature, and it seeks to direct all future water allocations within the Basin to a single priority—instream flows for migrating fish populations.

Summary Observations and Comments:

- Through its flow targets and augmentation program, the NMFS is developing a water policy within the Columbia River Basin drainage of "zero net loss."
- The NMFS policy calls for no further water withdrawals from the Snake-Columbia River mainstems, tributaries to the main river system, and related groundwater sources; and it directs federal and state agencies to review the impacts of existing water withdrawals on its flow targets program.
- If adopted, the NMFS policy would effectively abrogate or challenge state authority to grant future water rights for municipal, industrial, or irrigation uses. By calling for a "review" of existing water withdrawals, the policy postures toward challenging existing state-granted water rights.
- Under the NMFS water policy, future (new) water allocations from within the Columbia River Basin drainage are to be used solely for in-stream fish flows.

3.0. NMFS Water Policy Justification, Flow Targets/Augmentation Program.

Much of the justification for the NMFS water policy may be attributed to the NMFS "flow targets" developed within the its 1995 Biological Opinion (NMFS 1995). The 1995 BIOP calls for dedicated amounts of water storage and releases during the spring and summer migration periods, to enhance existing flow levels through the Snake-Columbia River mainstem system. The NMFS flow augmentation program is principally aimed at attempting to improve survival levels for Snake River Endangered Species Act (ESA) listed salmon.

3.1. Development of the Flow Targets/Augmentation Program.

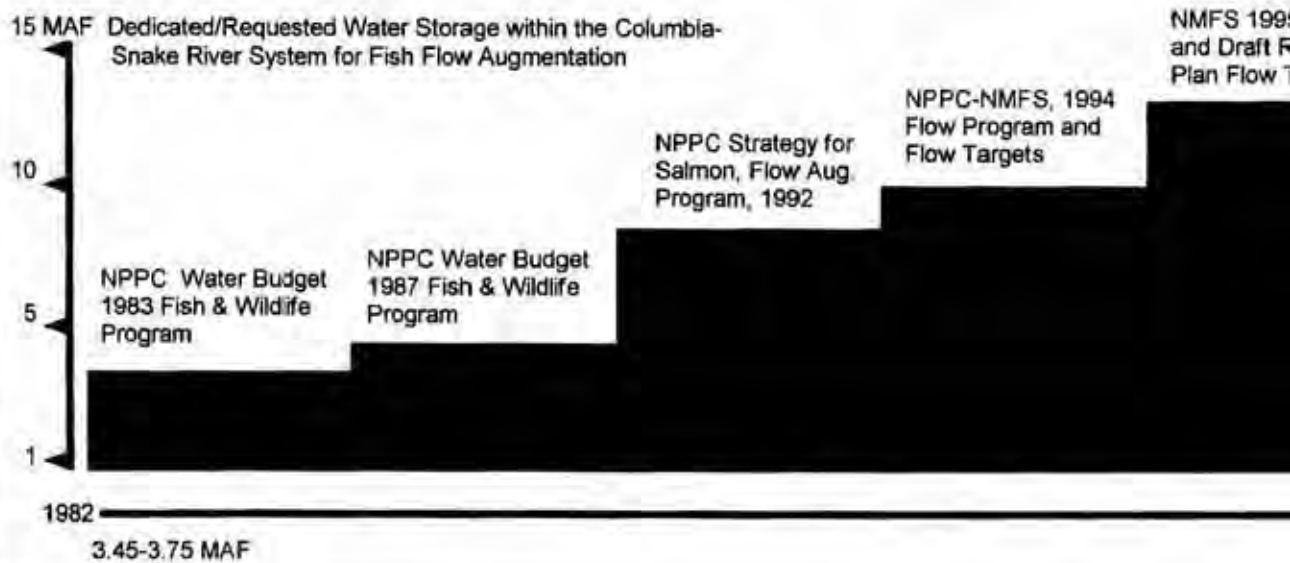
The origin of the NMFS flow targets/augmentation measures can be readily traced to the flow enhancement program produced by the Northwest Power Planning Council (Council) during the 1983-1994 period. The NMFS flow target/augmentation measures are largely an extension of the Council's flow enhancement program, as developed and applied through several Columbia Basin Fish and Wildlife Programs. The Council's authority to recommend flow regimes or adopt flow enhancement measures is derived from the Northwest Power Act.

In 1983, the Council proposed a "water budget" for flow enhancement, to be used during the spring migration period (NPPC 1983; Corps 1994). Water volumes from storage reservoirs were made available specifically to "enhance" existing water regimes, with the water being released during the spring migration period. At this time, much of the emphasis behind the flow enhancement program was to hasten juvenile migrant travel time through the reservoirs and hydroelectric power corridor.

Since 1983, the water volumes either requested or made available for flow enhancement programs have increased substantially, as depicted by the "stair-step" rate of growth presented in Figure 1. The volume of water requested for flow enhancement or augmentation has increased from about 3.75 MAF to about 13-16 MAF. The flow enhancement requests or dedications have increased with the preparation of each successive Council Fish and Wildlife Program and, in more recent years, with the development of the NMFS biological opinions for hydroelectric power system operations (1994 and 1995). Significant increases in dedicated water volumes have resulted from the ESA listings of Snake River salmon.

The present flow augmentation program is part of the NMFS 1995 Biological Opinion (1995) and Proposed Recovery Plan for Snake River Salmon (NMFS 1995). According to NMFS, this program should be capable of providing as much as 13-16 MAF of water for fish flows, to be released during the spring (May 10-June 20) and summer (June 21-August 31) migration seasons.

**Figure 1. Milestones of the Flow Augmentation/Targets Program
Columbia-Snake River System**



The NMFS flow enhancement program adopts flow objectives or "targets" to direct the need for flow augmentation water releases. The NMFS views the flow targets as key to its flow program operating criteria:

These flow objectives serve two important functions. First they represent the average flows that NMFS believes provide suitable in-river conditions for migrating fish and, as such, they provide a useful yardstick for measuring the acceptability of particular operating strategy...Second they serve to guide the in-season management process which helps determine when to use available water for flow augmentation (NMFS 1995, V-2-19).

The NMFS states that the flow objectives are not "intended as hard constraints on river operations, but as a guide for determining how to allocate scarce water."

The NMFS flow targets are measured at Lower Granite Dam for the Snake River, and at the McNary Dam for the Lower Columbia River system (total river basin system water flow or run-off). For the spring period, the flow targets are 85-100 kcfs and 220-260 kcfs, at Lower Granite Dam and McNary Dam, respectively; for the summer period, the flow targets are 50-55 kcfs and 200 kcfs, respectively at each project. The targets are supposed to reflect water run-off forecasts and the actual water available in the system.

Estimates of the actual water volume releases under the Council and NMFS flow augmentation programs are presented in Table 1 and Figure 2. For example, during a low water-year condition like 1994, about 10.6 MAF of water was provided for fish flows. Most of this water was released during the spring period, about 7.8 MAF. About 1.5 MAF came from the Snake River system during the summer period, with about 0.5 MAF from the Brownlee Project or above.

Summary Observation and Comments:

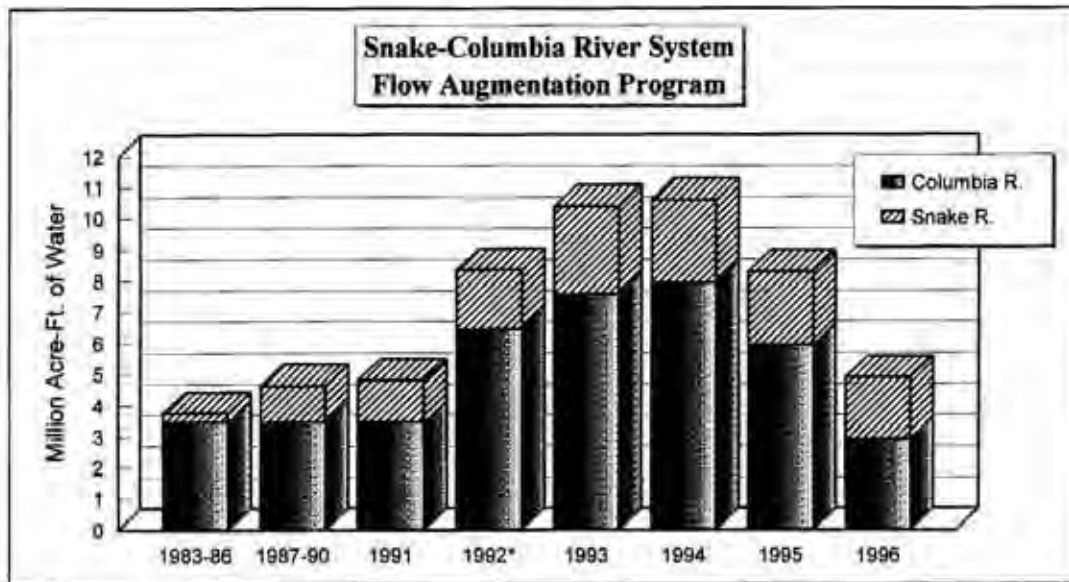
- > The NMFS flow targets/augmentation program follows on the development of the fish flow augmentation program devised by the Northwest Power Planning Council during the 1983-1994 period.
- > An initial "water budget" requested by the Council amounted to about 3.75 MAF, but has grown with the preparation of each new Council Fish and Wildlife Program; the NMFS 1995 BIOP now calls for as much as 13-16 MAF for dedicated flow enhancement.
- > The highest level of flow augmentation produced, about 10.6 MAF, occurred during the 1994 drought water-year; about 0.8 MAF was released from the Brownlee Project and above, about 1.9 MAF was released from Dworshak Reservoir, with the remaining water being released from upriver Columbia system reservoirs.

Table 1. Columbia-Snake River
Flow Augmentation Program
1994-1996

Flow Augmentation	Estimated	Estimated	Estimated
Spring Period:	1994	1995	1996
Snake River (MAF)			
Dworshak	0.87	0.83	0.27
Brownlee and Above	0.33	0.35	0.41
Total Snake R.	1.20	1.18	0.68
Columbia R. (MAF)			
Arrow (Canada)	—	(1.47)	(0.14)
Libby/Hungry H.	—	1.60	0.36
Grand Coulee	—	3.70	(0.07)
Total Columbia R.	6.60	3.83	0.15
Total Flow Aug.	7.80	5.01	0.83
Summer Period:			
Snake River (MAF)			
Dworshak	1.02	0.92	0.95
Brownlee and Above	0.46	0.26	0.35
Total Snake R.	1.47	1.18	1.30
Columbia R. (MAF)			
Arrow (Canada)	0.20	1.60	1.33
Libby/Hungry H.	0.00	(0.43)	0.35
Grand Coulee	1.13	0.94	1.09
Total Columbia R.	1.33	2.11	2.77
Total Flow Aug.	2.80	3.29	4.07
Spr-Sum Total Flow Aug.	10.60	8.30	4.90

Data Source: Bonneville Power Administration, Dittmer Control Center, Portland, Oregon
August-December 1997. Estimates are based on net with/without fish operations impacts to
the hydro system.

Figure 2. Columbia-Snake River
Flow Augmentation Program
1983-1996



	Usable 1983-86	Usable 1987-90	Est. 1991	Est. 1992*	Est. 1993	Est. 1994	Est. 1995	Est. 1996
Snake River (MAF)								
Dworshak	---	---	---	---	2.298	1.89	1.75	1.21
Brownlee & Above	---	---	---	---	0.525	0.79	0.61	0.76
Total Snake R.	0.3	1.18	1.36	1.9	2.823	2.68	2.36	1.97
Columbia R. (MAF)								
Arrow (Canada)	---	---	---	---	---	---	0.13	1.19
Libby/Hungry H.	---	---	---	---	---	---	1.17	0.71
Grand Coulee	---	---	---	---	---	---	4.64	1.02
Total Columbia R.	3.45	3.45	3.45	6.45	7.58	7.93	5.94	2.92
Total Flow Aug.	3.75	4.63	4.81	8.35*	10.40	10.61	8.30	4.89

Data Source: Bonneville Power Administration, Dittmer Control Center, Portland, Oregon August 1997; USACE, 1994; and NPPC, Strategy for Salmon, 1992. Estimates are based on net with/without fish operations impacts to the hydro system.

* A 1992 estimate from BPA is higher than the values indicated below. The BPA estimate is about 10.79 MAF, with 8.68 MAF from the Columbia system and 2.11 MAF from the Snake.

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- In the 1994 low water year, about 0.5 MAF was provided from the Brownlee Project and above during the summer period; and about 1.0 MAF came from Dworshak Reservoir.
 - Within the NMFS flow augmentation program, the "flow targets" serve as operational guides for in-season water management, determining when to use available water for flow augmentation.

4.0. River System Hydro Regulation Studies and the Flow Targets.

The relationship between Columbia River Basin hydrologic (water run-off) conditions and the NMFS flow targets is best described by the hydro regulation and water depletion studies being conducted by the U. S. Bureau of Reclamation (USBR). These studies (USBR 1997) provide estimates of water flows at specific points along the river system, based on 50-year (or 60-year) water records. The studies further specify the average monthly flow levels given four different hydro (flow) regimes: 1) a natural flow condition; 2) natural flows with irrigation depletions; 3) current flow conditions under the NMFS 1995 BIOP regulation, including irrigation depletions; and 4) current flows with the effects of irrigation depletions removed.

Under the natural flow regime, the effects of all reservoir storage operations and water depletions are removed; natural flows represent a Columbia River system that existed prior to the mid-1800s and before irrigation and hydroelectric power dam were constructed. Under the natural flows with the effects of reservoir storage removed regime, water withdrawals would be met only by natural flow water conditions; irrigation depletions would exist but without water storage reservoirs.

Representing the current flow regime, flow and water depletion conditions would depict the existing 1995 BIOP hydro regulation, with existing water depletions and fish flow enhancement. Under the current flows and with the effects of irrigation depletions removed, the existing reservoir system is assumed to be in place, but no water is being diverted for irrigation, and the reservoirs are operated to their limits to meet the NMFS 1995 BIOP flow targets.

4.1. Flow Regime Hydrology and Flow Target Implications.

Analyses of the USBR (1997) hydro regulation data highlight several operational features inherent to the four major flow regimes, and illustrate an ability of the river system to meet the NMFS flow targets during key water-years and under different water depletion conditions. The analyses also offer a better understanding of how the different net variations in water-year flows compare to net water depletions.

Figure 3 examines the four major flow regimes under a low water-year condition (1976-77), with average monthly flows (across the 50-year water record) measured at the McNary Dam. The regulation data display the "shape" of the different flow regimes and of the peak flow months, May and June. The data also depict the impact of the net irrigation depletion levels, the difference between the BIOP with irrigation versus the no irrigation with storage flow levels.

With low water-year conditions, the Columbia River Basin net system irrigation depletion amounts to about 29% of the total system run-off during the peak irrigation month of July; and about 25% during the month of June.

Figure 3 also displays the river system's ability to meet the NMFS flow targets. For example, during the spring period, the average monthly flows cannot reach the flow target level of 220 kcfs, either with or without the effects of net irrigation depletions. During the summer period, the same situation holds true, with both the BIOP and no irrigation flow regimes considerably less than the flow target of 200 kcfs. It should be emphasized that neither the natural flow nor dedicated reservoir storage for fish flow can meet the 200 kcfs target.

The river flow regimes for average water conditions, measured at McNary Dam, are presented in Figure 4. In July and August, net irrigation depletions account for about 16% and 20% of the total system run-off (see Figure 5). During an average annual run-off period, the net irrigation depletion (about 13 million acre-feet) amounts to about 6-7% of the total flow measured at the mouth of the Columbia River, approximately 200 million acre-feet (Corps 1995).

Under average water conditions, the spring flow target of 260 kcfs is met under all four water regimes. But the summer flow target for August of 200 kcfs cannot be met, either with or without net irrigation depletions. And the natural flow regime falls below the summer flow target, in August, as well.

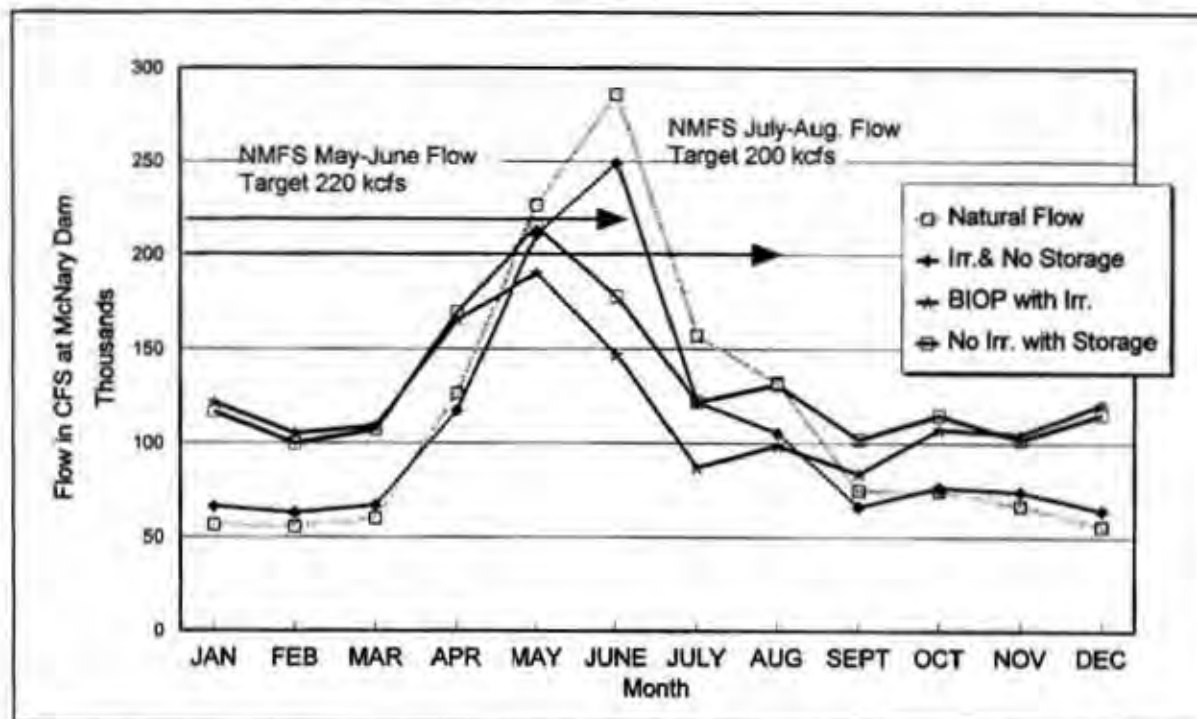
Similar types of hydro regulation analyses can be made for flows measured at the Lower Granite Dam, using the USBR hydro regulations. In Figure 6, a low water-year (1976-1977) condition is examined, in relation to the four major flow regimes. Under this water condition, net irrigation depletions amount to about 40% and 50% of the total run-off during the months of July and August.

From Figure 6, it is apparent that neither the spring (85 kcfs) nor summer (50 kcfs) flow targets can be met, with or without system net irrigation depletions. Even under the natural flow regime, the flow targets are substantially beyond the hydrologic capabilities of the river system to meet. There are no river conditions that can come close to the flow targets under low water conditions.

In Figure 7, flow regimes at Lower Granite Dam are presented under average water conditions (monthly average for the 50-year water record). Net irrigation depletions amount to about 27% and 39% for the peak water use months of July and August (see Figure 8).

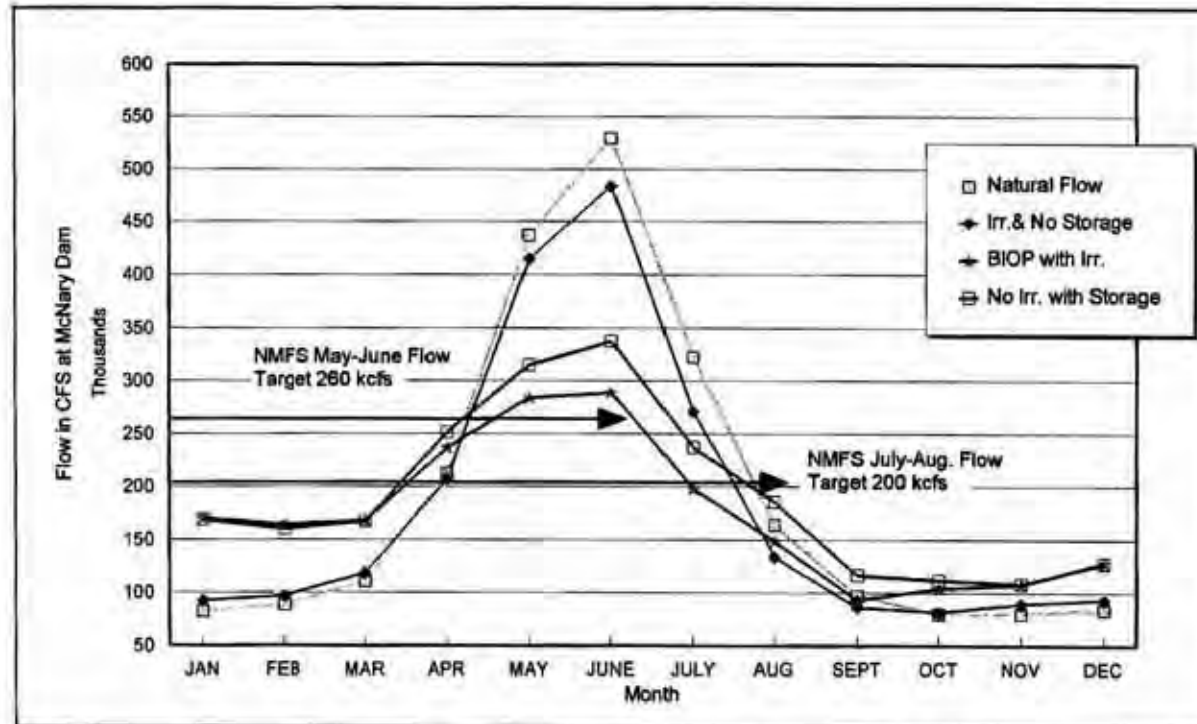
Figure 7 also displays the effects of net irrigation depletions on the ability of the river system to reach flow target levels. During the spring period, the flow target (100 kcfs) can be met by the four major flow regimes. However during the summer period, in August, the monthly average flow for the four water regimes drops below the flow target (55 kcfs) level. *In August, the net irrigation depletion flow is equal to the water level that would occur under a natural flow regime, about 31 kcfs at Lower Granite Dam.* Both the net irrigation depletion and natural flow regimes fail to achieve the flow targets.

Figure 3. Columbia River Basin Water Flows
Estimated Low Water Condition (1976-77), Average Monthly Flows at McNary Dam



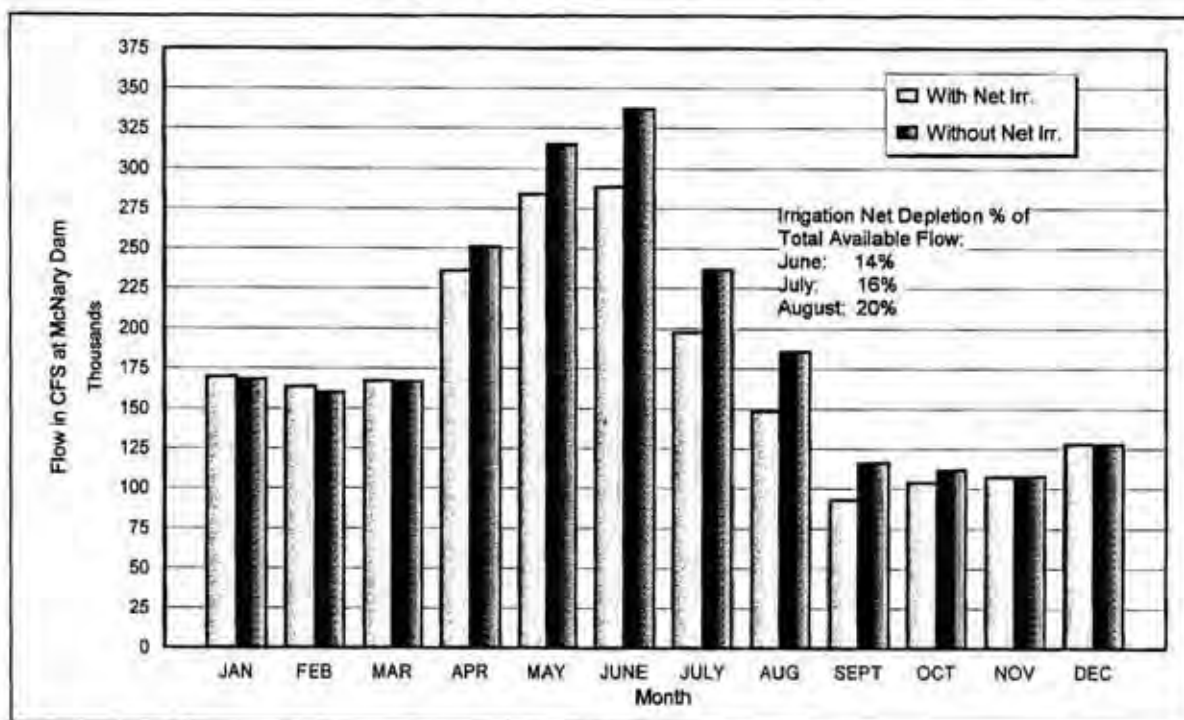
Data Source: USBR, Cumulative Effects of Water Use, Interim and Draft Reports, March-October 1997.

Figure 4. Columbia River Basin Water Flows
Estimated Average Water Condition, Average Monthly Flows at McNary Dam



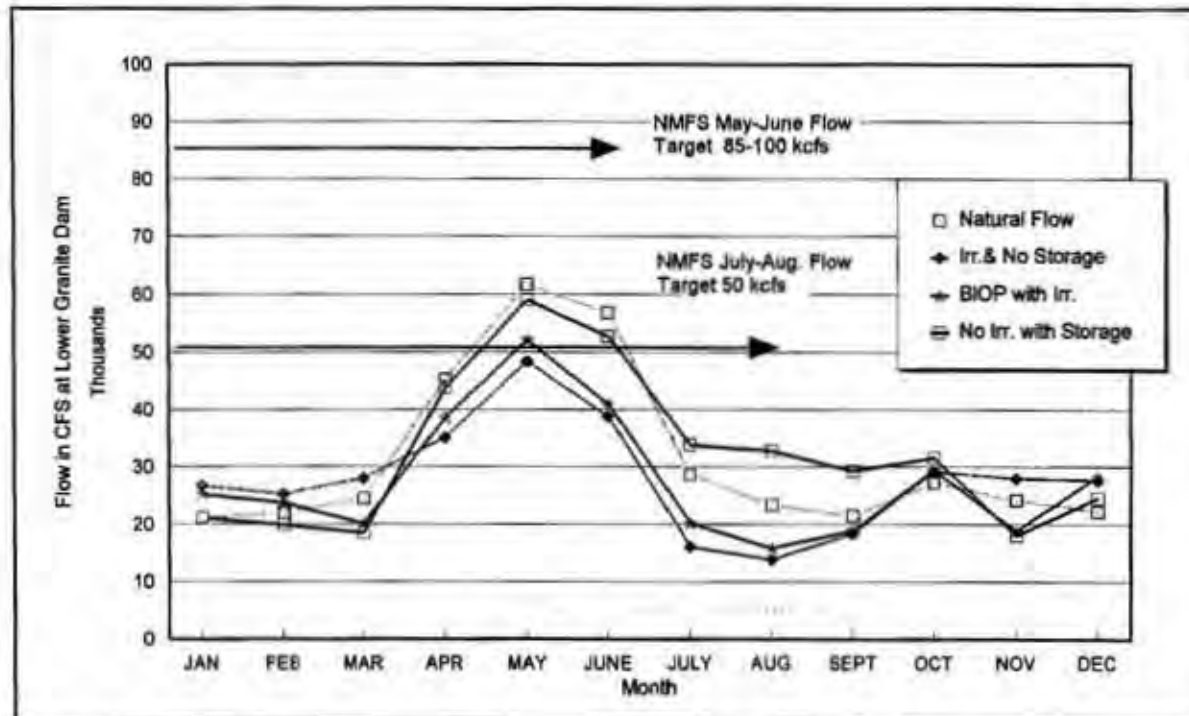
Data Source: USBR, Cumulative Effects of Water Use, Interim and Draft Reports, March-October 1997.

Figure 5. Columbia River Basin Water Flows
With/Without Net Irrigation Depletion, Average Monthly Flows at McNary Dam



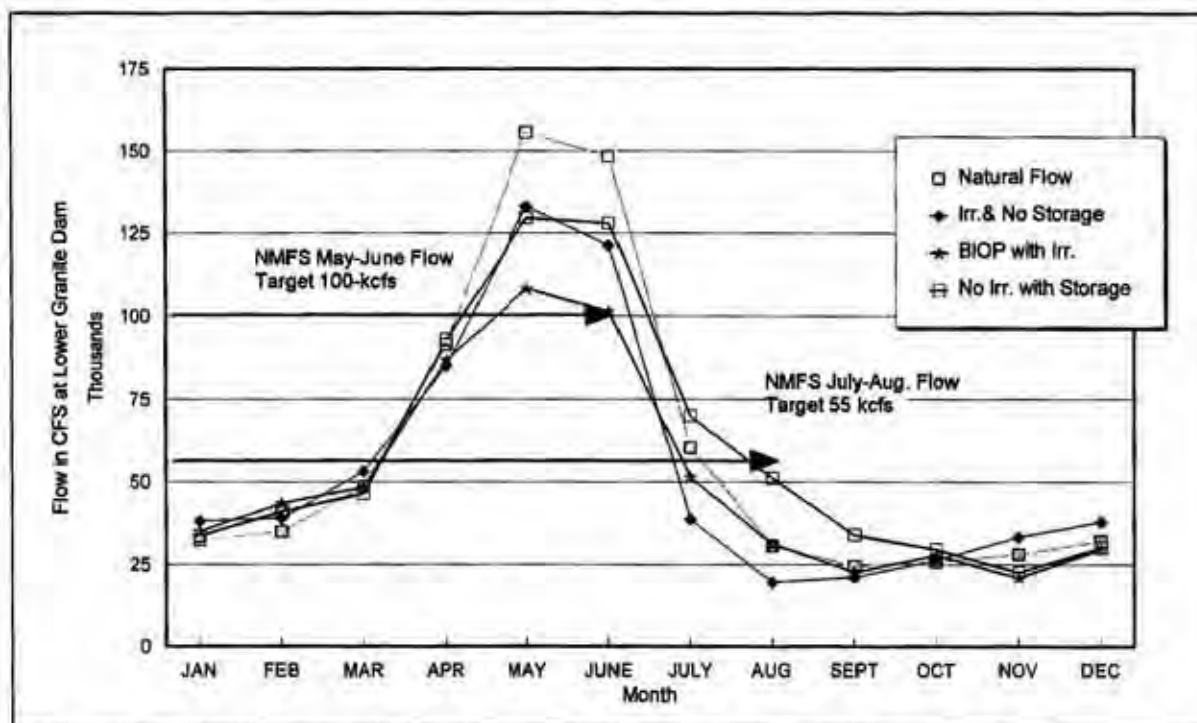
Data Source: USBR, Cumulative Effects of Water Use, Interim and Draft Reports, March-October 1997.

Figure 6. Columbia River Basin Water Flows
Estimated Low Water Condition (1976-77), Average Monthly Flows at L. Granite Dam



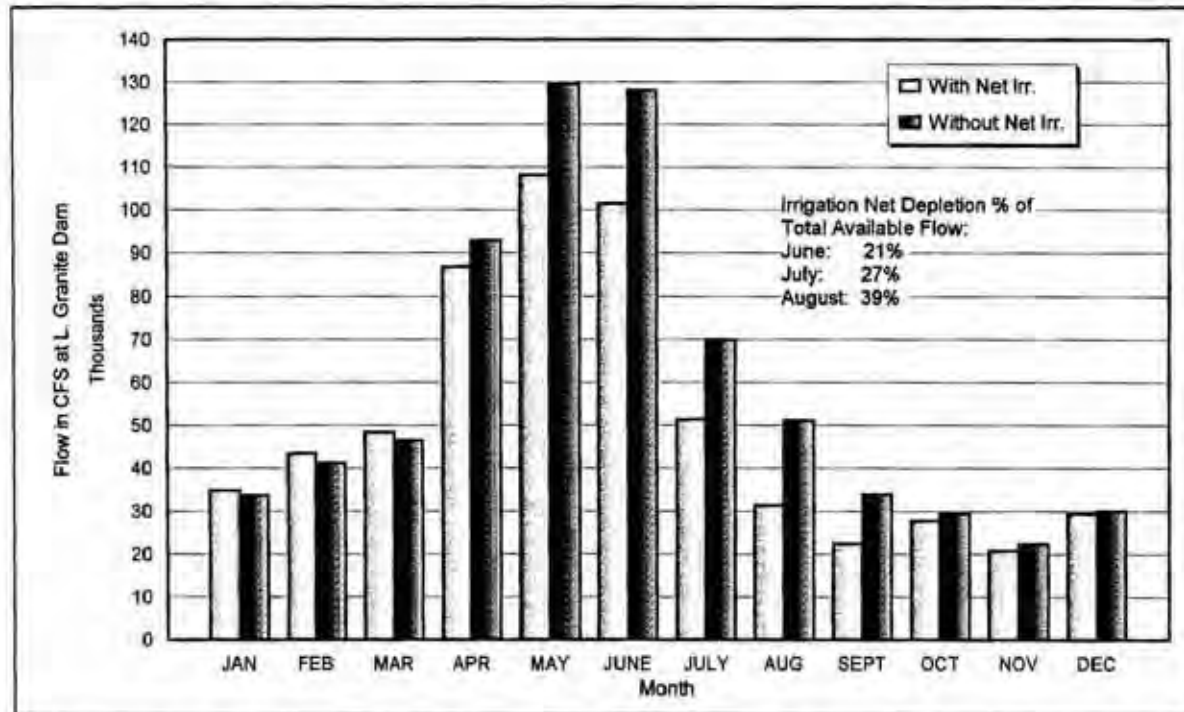
Data Source: USBR, Cumulative Effects of Water Use, Interim and Draft Reports, March-October 1997.

Figure 7. Columbia River Basin Water Flows
Estimated Average Water Condition, Average Monthly Flows at L. Granite Dam



Data Source: USBR, Cumulative Effects of Water Use, Interim and Draft Reports, March-October 1997.

Figure 8. Columbia River Basin Water Flows
With/Without Net Irrigation Depletion, Average Monthly Flows at L. Granite Dam



Data Source: USBR, Cumulative Effects of Water Use, Interim and Draft Reports, March-October 1997.

4.2. River System Net Flow Variability.

Another factor to consider in reviewing the effects of either flow augmentation or irrigation net depletions is year-to-year system variability, the dramatic changes that can occur in total volume water run-off. System control is very limited, with or without flow augmentation, and changes to net year-to-year flows typically overshadow the net irrigation depletion for the Columbia River Basin system.

Figure 9 displays the net differences in flow levels, as measured at the McNary Project, using the USBR (1997) hydro regulation for the 1995 BIOP operations (which includes net irrigation depletions). Net flow differences are described for the months of June, July, and August for a 50-year water record. The net flow levels depict between year flow differences. For example, if the flow in one year (for June) averaged 200 kcfs and in the next year increased to 250 kcfs, then the net flow difference would be 50 kcfs; or conversely, if the flow decreased from 250 kcfs to 200 kcfs, the net flow difference would be 50 kcfs.

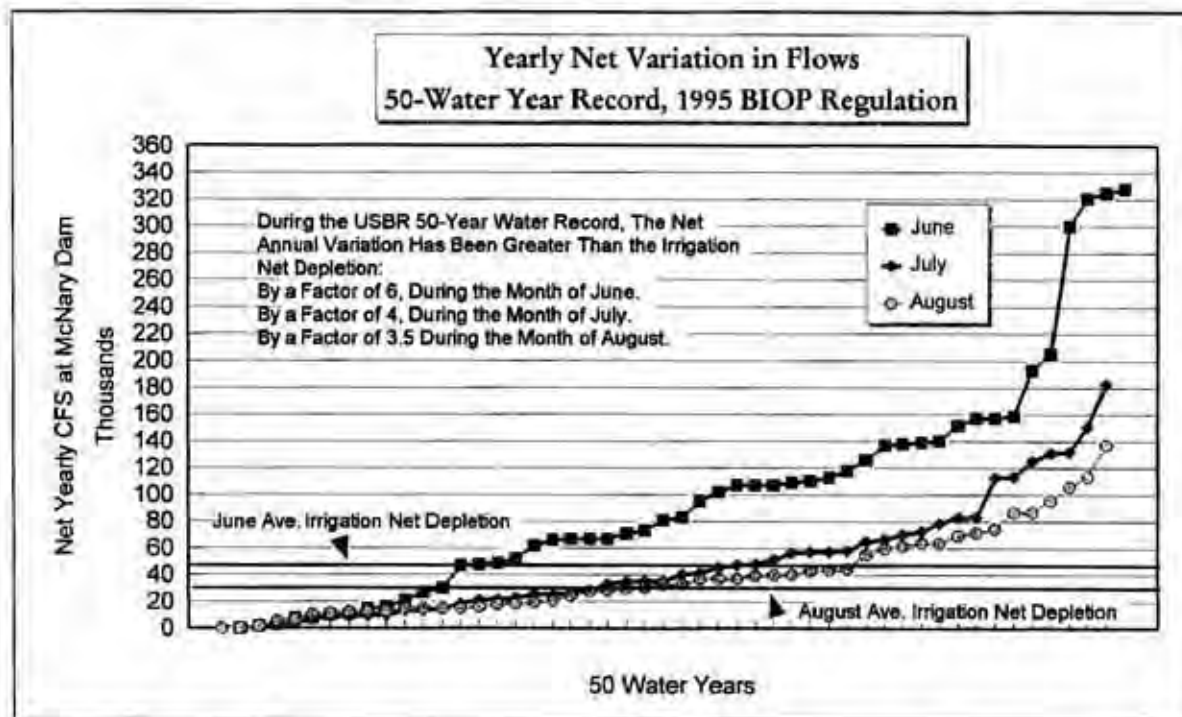
In Figure 9, it is apparent that the yearly net variation in flows can exceed the net irrigation depletion by as much as a factor of 3.5 to 6 (250 to 500%), depending on the month selected. The 50-year water record indicates that the variation in net flows exceeds net irrigation depletions in a majority of years for the months of June and August. In July (similar net irrigation depletion level as in June), the net yearly variation in flows exceeds the net irrigation depletion in about one-third of the water record years.

This wide-ranging variability in net flow levels means that efforts will be insignificant to use either flow augmentation or marginal decreases to irrigation withdrawals to "recreate" or "simulate" high volume flow years within the Lower Columbia River system.

Summary Observations and Comments:

- The USBR hydro regulation studies demonstrate that the NMFS flow targets cannot be met in all months, during low or average water-years, because they require more water than the hydrologic system can provide, with or without the effects of net irrigation depletions.
- During low and average water years for the summer flow augmentation period, the NMFS flow targets exceed water levels that would be available under natural river system conditions, and with or without the effects of net irrigation withdrawals.
- The net irrigation depletions *are not* the primary reason why the NMFS flow targets cannot be met; the problem rests with the flow targets themselves--the targets are well beyond the Basin's hydrologic capabilities.

Figure 9. Columbia River Basin Water Flows
Net Irrigation Diversion Compared to Yearly Net Flow Changes



Data Source: USBR, Cumulative Effects of Water Use, Interim and Draft Reports, March-October 1997.

-
- The annual natural run-off within the Basin is highly variable; the yearly net variation in flows for a 50-year water record substantially exceeds or overshadows net irrigation withdrawals, measured at McNary Dam.
 - Attempts will be insignificant to use either flow augmentation or marginal decreases to irrigation withdrawals to "recreate" or "simulate" high volume flow years within the Lower Columbia River system.

5.0. *Biological Basis for Flow Targets/Augmentation.*

5.1. *History of the Flow-Survival Relationship.*

A central element of the NMFS (1995) Salmon Recovery Plan is flow augmentation, in which spring and summer flows are increased by releases from storage reservoirs or, by implication, through the reduction of irrigation water withdrawals. The justification for these actions is based on the general relationship: *additional river flow = higher fish survival*. This principle, with origins predating any data, is based on the belief that increased river flows decrease fish travel times and thus decreases the exposure of juveniles to predation and other in-river hazards. In addition, in terms of the recent Normative River concept (ISG Review 1996), increased flows create a hydro system that more closely mimics the natural river prior to the development of the dams. While early evidence and analyses appeared to support a strong flow survival relationship, the recent studies do not.

Historically it has been observed that higher yearly average flows are correlated with higher fish survival, measured as either in-river survival of juveniles or as smolt-to-adult return rates. While it is not disputed that the relationship involves complex interactions of environmental and human factors, it also has been believed that some of the benefits of the observed year-to-year correlations can be obtained through manipulation of the hydro system flow *within a year*. Thus, there is a fundamental belief that by increasing the water flow in a dry year some of the benefits of a wet year can be created. This strategy is at the foundation of the flow targets of the 1995 NMFS Biological Opinion. By regulating hydro system flows and reducing system-wide irrigation withdrawals, fish managers attempt to put sufficient water through the hydro system during the smolt migration to avoid low flows and the high mortalities believed to occur with them.

In the past, a strong flow-survival relationship was widely accepted. But the recent evidence supports a weak flow-survival relationship, and the quantitative difference between the strong and weak responses is vast. For example, in 1990, an analysis conducted with the System Planning Model (SPM) predicted that from a base 93 kcfs Ice Harbor flow an additional 47 kcfs of flow would increase spring chinook survival by 180% (CBFWA 1990). But with more recent data and model analyses, we have revised the potential increase to 1.5%. This newer estimate is over a hundred times weaker than the older one.

From an historical perspective, the evidence supporting first a strong response and then a weak response evolved in two distinct periods, with a shift at the beginning of the 1990s (see Table 2). Using research from the '60s, '70s, and '80s, analyses published in the early 1980s purported a strong flow-survival hypothesis. Succeeding studies and analyses in the 1990s have reevaluated the data and key information, and from this work a weak flow-survival hypothesis has emerged. The existing management plans were developed with the belief in a strong flow-survival relationship and place flow augmentation as a central management tool. Although the NMFS Recovery Plan decision scheduled for 1999

**Table 2. Historical Progress of the Flow-Survival Relationship
Key Studies and Programs/Plans**

Year	Supporting a Strong Flow-Survival Relationship	Supporting a Weak Flow-Survival Relationship
1980s	Sims and Ossinder 1980s (70s-80s Spring Chinook Studies)	
1983	NPPC Fish & Wildlife Program*	
1987	NPPC Fish & Wildlife Program*	
1990	CBFWA Integrated System Plan*	
1992	Petrosky 1992 (Adult Return Rates Correlated with Travel Time)	Marsh and Achord 1992 (PIT Tag Study Suggests High Survival-1973 Water Conditions)
1993	Hilborn, et al, 1993 Berggren and Filardo 1993 (*Fall Chinook Flow- Travel Time Relationship)	
1994	Cada, et al. 1994 (Some Relationship Between Flow and Survival) NMFS 1994 BIOP*	Giorgi, et al. 1994 (No Fall Chinook Flow-Travel Time Relationship) Olsen and Richards 1994 (Ocean Conditions Are Affecting All West Coast Chinook Runs)
1995	NMFS 1995 BIOP*	Williams and Mathews 1995 (Low Survival Tied to Trash Conditions at Dams) Skalski, et al. 1996 (Fall Chinook Survival Depends on Lower River Stock Selection)
1996		Anderson 1996 (Climate-Cycle Correlates with Ocean Survival)
1997		Smith, et al. 1997a (1993-1997 Data) (No With-Year Relationship Between Flow-Survival for Spring Migrants) Giorgi, et al. 1997 Smith, et al. 1997b (No Clear Relationship for Within Year Flow Survivals, Fall Chinook)
1998	FLUSH Model Has Strong Relationship Via Delayed Mortality	CRISP Model Has Weak Relationship Via Delayed Mortality

* Fish mitigation and recovery programs.

will likely include flow measures, *the Recovery Plan should reconcile its flow augmentation program with the more recent data and modeling analyses.*

5.2. Strong Flow-Survival Relationship.

The early belief of a strong flow effect was based on NMFS studies conducted on a yearly basis between the mid-1960s and the mid-1980s. Fish were tagged and released in Snake River tributaries and collected at John Day or The Dalles Dam on the Lower Columbia. Sims and Ossiander (1981) presented a graph of seven data points displaying average spring chinook smolt survival versus average flow between 1973 and 1979. The data suggested a strong relationship between smolt survival and flow, but it was driven by the two lowest flow years (1973 and 1977). Excluding these years, the relationship was flat; that is, no discernible relationship was evident between the average yearly flow and the estimated survival for the year.

Resource managers embraced the "Sims-Ossiander relationship" and formalized it in a computer model, the Passage Analysis Model, as developed by the Northwest Power Planning Council staff. They concluded that one reason for the decline in stocks over the 1970s was decreased spring flows associated with the hydro system. It was then assumed that, if water from storage reservoirs was released into the river in the spring, the effect of high flow water years could be recreated, and smolt survival would increase.

This leap of faith from seven data points to a fully developed theory of the impact of shaping river flows, within a year, was scientifically overly simplistic and has been criticized in numerous documents (Steward 1994, Williams and Matthews 1995, NMFS 1995). The evidence now suggests that ocean environment, fish condition, poor dam operations and adverse passage conditions, especially in the two lowest flow years, had more to do with the apparent flow-survival relationship than flow itself. These issues were unknown at the time, but managers thought by simply "re-shaping" the seasonal outflow profile from storage reservoirs, they could rebuild the fish runs in the basin.

If the flow survival relationship was only based on the Sims and Ossiander (1981) study, the aggressive flow enhancement measures would not have been adequately justified. In 1991, though, the strong flow-survival hypothesis received additional support through an analysis illustrating that spring chinook adult return rates were larger for years with shorter water travel time during the smolt migration season (Petrosky 1992). The data spanned the period 1960 through 1987, and fish managers refined their hypothesis by inferring that decreasing water travel time would increase adult returns. Although the focus shifted from flow to water travel-time and from smolts to adults, the promise was the same: modest increases in flow, within a year, would recreate the strong benefits in survival that had been observed in earlier years.

Also, evidence for a relationship between flow and travel time for spring chinook was published by Berggren and Filardo (1993). More evidence was added with an analysis

of the coded wire tagged adult returns of fall chinook from the Priest Rapids hatchery on the mid-Columbia (Hilborn, et al., 1993). The authors attempted to remove the impact of variable ocean conditions by comparing survival of the Mid-Columbia stock to a downstream hatchery stock. The authors concluded that a significant relationship existed between smolt-to-adult survival and an index of river flows during smolt out-migration.

The evidence on spring chinook and steelhead smolt survivals (Sims and Osslander 1981), spring chinook smolt-to-adult ratios (Petrosky 1992) and recruitment of fall chinook adults (Hilborn, et al., 1993) merged in the early 1990s into a qualitative belief that year-to-year differences in flow or travel time were associated strongly with year-to-year differences in survival. Cada, et al., (1994) reviewed historical data and studies and did identify inconsistencies in the flow survival hypothesis. Nonetheless, they concluded that there was a relationship between flow and survival—particularly between large volume flow differences—that needed further definition and elaboration.

The belief also that within a year water shaping and augmentation of flow could benefit smolt or adult survival was accepted, even though it was largely unsupported by empirical data or theory. Consequently, the practice became a foundation of the NMFS 1995 BIOP flow targets and augmentation program. The underlying belief was that changes to the hydro system operations, within a smolt migration year, would produce significant improvements in returning adults.

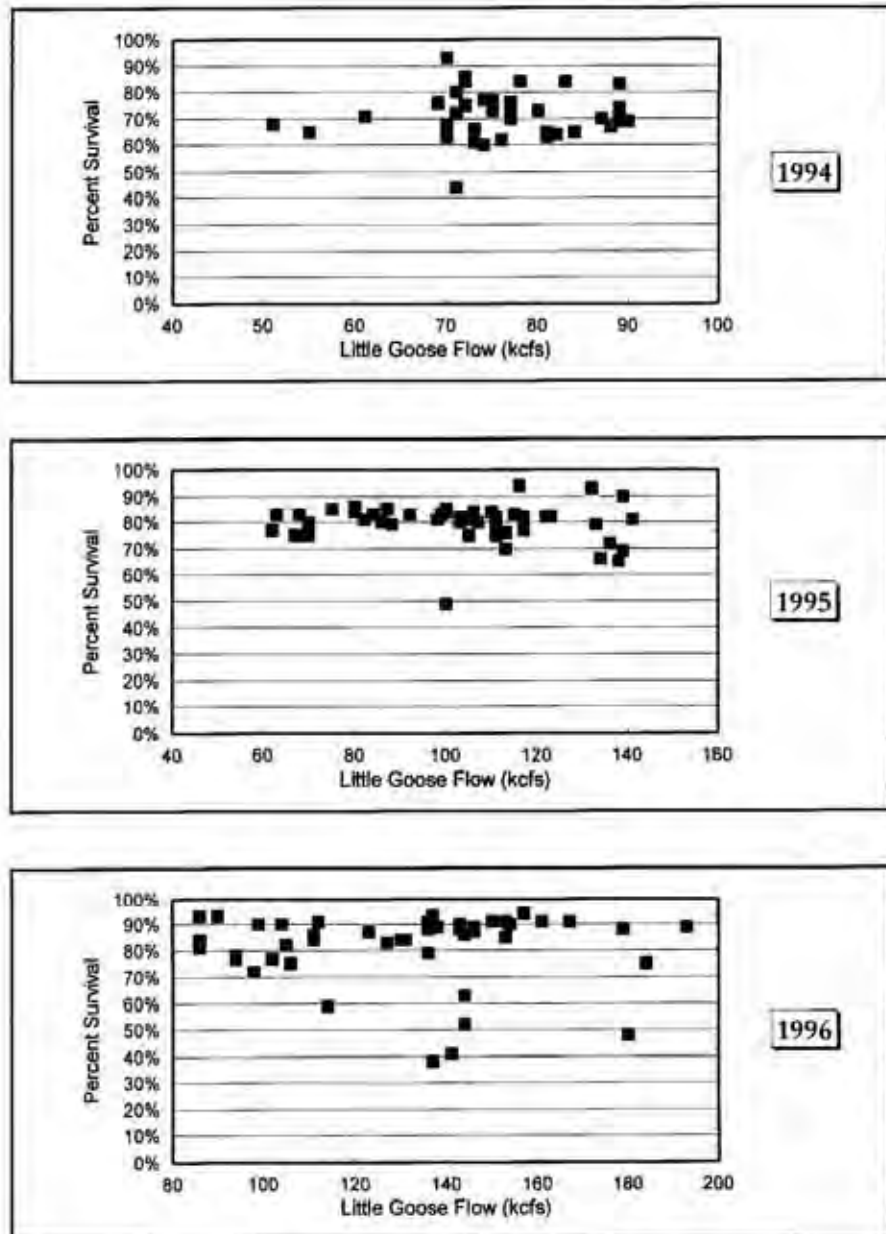
5.3. *Weak Flow-Survival Relationship.*

The first evidence for a weak flow-survival relationship evolved out of individual studies on specific species. The work all took place after preparation of the Cada, et al., (1994) report, and it represents a radical departure from the previously accepted belief system. The main evidence is based on new PIT-tag survival studies. This technique allowed tagging and non-invasive detection of individual fish and represented a breakthrough in survival studies by decreasing the error in the statistical estimates to only a few percent.

A prototype study was conducted in 1992, an extremely low flow year comparable to 1973, which had the second lowest smolt survival on record (Marsh and Anchord 1992). The results rattled the foundation of the old belief system. Estimates of survival were nowhere near the 1973 levels. Subsequent expanded studies conducted through 1997 have conclusively proven that a strong flow-survival relationship for spring chinook and steelhead smolts does not exist (Smith, et al., 1997a). A regression of the survival data for spring chinook migrating from Lower Granite tailrace to Lower Monumental tailrace from 1994 through 1996 resulted in a shallow slope with a relatively low statistical relationship.

More important for management, though, were the relationships between flow and survival *within years* (see Figure 10). Whereas a corollary to the strong hypothesis that within-year flows would benefit within-year survivals, the PIT tag analyses indicated no

Figure 10. NMFS/UW Survival Data, 1994-1996
Survival Rates for Juvenile Spring Chinook Release Groups
(L. Granite Tailrace to L. Monumental Tailrace)



relationship whatsoever (Smith, et al., 1997a). In essence, the PIT tag data and the subsequent analyses conclusively prove that the strong inseason flow-survival hypothesis for spring chinook and steelhead smolts--as was originally claimed from the Sims and Osslander studies--is not supported.

The old data did have low survivals, and so these survival estimates also must be considered. Although it is often difficult to explain the past, Williams and Matthews (1995) added a key missing factor. They reviewed the hydro system records and data and showed that in the early survival studies, the hydro system was radically different than it is now. Significant accumulations of trash in the forebays of the Upper Snake River dams, intermittent turbine operations in low flow years, and large spills and gas supersaturation levels in high flow years (and in years with reduced dam hydro capacity) all contributed to the mortality reported in the Sims and Osslander work. Improved dam operations have reduced mortality problems and have increased dam passage survival. As such, reconciliation of the Sims and Osslander studies and the new PIT tag studies is straightforward.

Having addressed errors in the formulation of the spring chinook flow-survival relationship for smolts, the need also exists to address the relationship between travel time and adult returns presented by Petrosky (1992). The management action implied is that by decreasing water travel time by any means, there will be increases to adult fish returns. Again, the leap of faith to flow augmentation as a management action is wholly unsupported. Although the correlation between smolt-to-adult returns (SAR) and water travel time over 27 years of observations is visually evident, it is a misleading correlation, since flow had very little impact on either variable in the time series.

The main factor was simply the change in the number of dams over the 27 years. In the early part of the time series (1966-1969), smolts and adults passed three dams, while in the latter part of the series (after 1976), they passed eight. Dams increase water travel time and the cumulative mortality in dam passage, but increasing flow would only have a minor impact on travel time and would only improve dam passage survival as a consequence of spill, albeit in a minor but measurable way.

A second factor driving the correlation is the change in ocean/climate conditions over the analysis period. In the early part of the time series, climate was in a wet regime favorable to the survival of the Columbia River salmon and, in 1977, it shifted into a dry regime unfavorable to their survival (Anderson 1995; also see Olsen and Richards 1994).

The final issue relevant to the earlier data analyses is that after 1977, about 80% of the Snake River spring chinook spawners were barged through the river as smolts. Thus their passage through the hydro system was independent of water velocity, and so it is incorrect to identify a mechanistic relationship between the survival of transported fish and water travel time.

In their 1995 BIOP, the NMFS recognized that the data supporting the recommended flow augmentation program contained limitations, and the agency has continued to better define and understand the flow-survival hypothesis.

5.4. Flow-Survival Factors Affecting Fall Chinook.

The effect of flow on fall chinook is less defined and has been confounded because the fish feed and grow as they move slowly through the river system in the summer and late fall. And since temperature changes can have both a positive and potentially negative (thermal shock and changes to FGE) impacts on the fish, the implications of flow augmentation are very complex and are yet to be well understood.

Most studies on smolts have focused on the relationship of flow to travel time. Giorgi (1994) reevaluated an expanded data set, encompassing that used by Berggren and Filardo (1993), and found no significant flow-travel time relationship for fish in the Lower Columbia. Evaluating data from the Mid-Columbia above McNary Dam, Giorgi, et al., (1997) found similar results. Fish length was the major determinant of fall chinook travel time, and flow was of secondary importance. Flow, by itself, explained about 28% of the observed variation in migration rate.

The fall chinook flow-recruitment to age two relationship found by Hilborn, et al., (1993) was reanalyzed by Skalski, et al., (1996), who expanded the analysis to include more explanatory factors than just river flow and included more downstream comparison stocks. Skalski, et al., (1996) concluded that the 24 years of Priest Rapids hatchery returns yielded little insight into key in-river factors that may be influencing hatchery return rates. In fact, of all the variables analyzed, *flow provided the least amount of predictive capability*. Also, the choice of the downstream comparison stocks greatly influenced the outcome of the analysis.

The recent PIT tag data provides a better picture of the complexity of the within season (year) survival of fall chinook in the Snake River. Smith, et al., (1997b) observed a trend between flow and survival that was not statistically significant (.05 level) within years but held moderate correlation. But it is noteworthy that the survival relationship was better described by the date fish passed Lower Granite or Little Goose dams. In general though, the factors affecting fall chinook in-river survival are not fully understood. A prolonged migration with the tendency of later migrating fish to residualize (stop migration and over-winter in the reservoir) complicates the interpretation of the effect of flow, temperature, release date, or fish size on their survival while passing through the hydro system.

Another affect flow may have on overall survival can be seen by examining the preliminary fall chinook adult PIT tag returns from both the 1994 and 1995 migration years (PITAGIS data base, 1998). The adult PIT tag data indicate that fall chinook juveniles detected at collector facilities from October 1, to December 10, produce about as

many returning adults as juveniles detected during the peak migration period (July-September)—a period when flow augmentation was used to protect juvenile migrants (see Figure 11). These data indicate a survival advantage for juveniles that delay migration until late fall. As such, management actions that attempt "to force" juveniles to migrate during a certain time frame may actually be detrimental to the overall survival of a given year class.

Still, the relationship between year-to-year flows and Lower Granite PIT tag detection of Hells Canyon fall chinook has an apparent correlation over the years 1992 to 1997. But as with the PIT tag results reported by Smith, et al., (1997b), the year-to-year correlation is complicated by protracted migration, temperature, and environmental factors. For example, 1992 was identified as a low flow year with a low detection rate. Yet 1997, an extremely high flow year, experienced substantially lower detection probabilities than the two previous years. Detections are not a measure of survival, so the relationship is complicated by these year-to-year changes in dam operations.

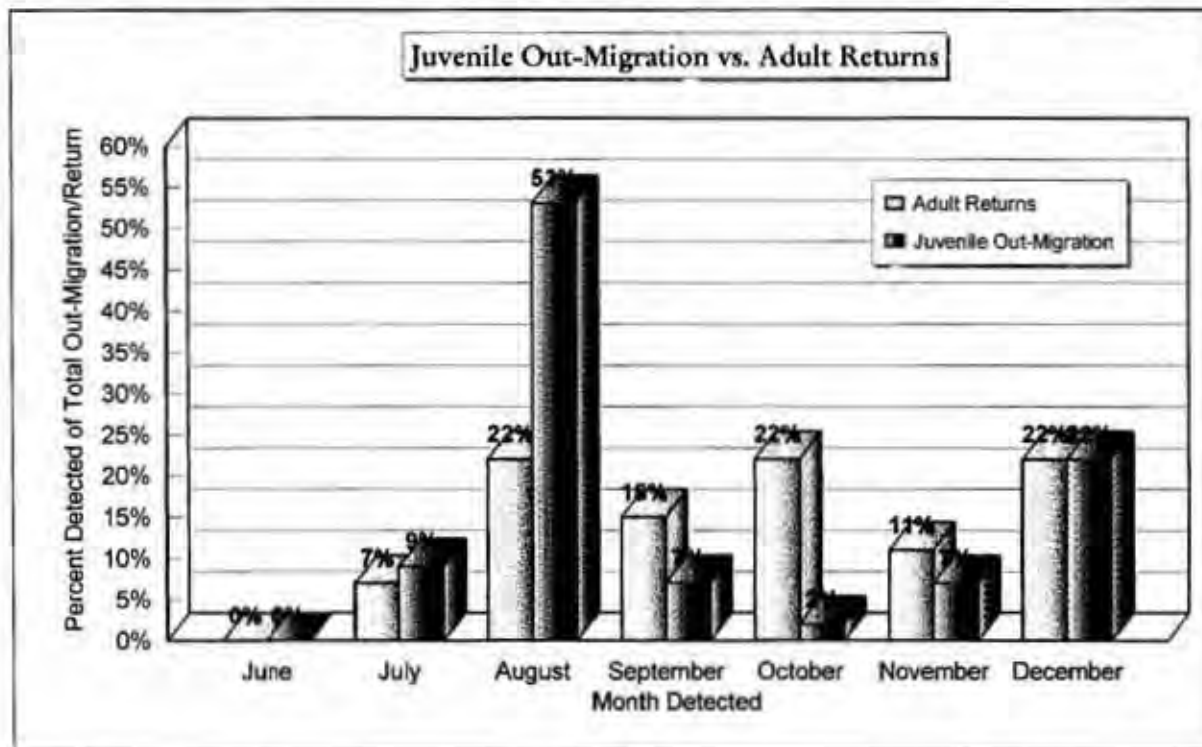
Further, the relationship between juvenile detection rate and survival from year-to-year is complicated by changes in project fish passage facilities. For example, from 1995 through 1997, extended-length screens were incorporated into both Lower Granite and Little Goose dams. These screens increase overall fish guidance efficiency which results in an increase in PIT tag detections. In addition, in 1996 and 1997, a prototype surface collector was installed at Lower Granite Dam. Because this system is not equipped with PIT tag readers, any tagged fish passing the project through this system would not be detected.

Even with these problems associated with the fall chinook detection results (only six average annual data points), the data present a story that is apparently being accepted by resource managers (Stelle 1997). This is cause for concern, given the region may fall into the same dilemma created by the seven data points representing the early Sims and Ossiander analysis.

Other patterns in the fall chinook data caution us about jumping to conclusions. A fundamental characteristic of mortality models is survival increases with decreasing travel time. This relationship exists for the within-year data evaluated by Smith (1997b), in which no flow-survival relationship could be identified, but is absent from the year-to-year data, which has a simple linear flow-survival relationship. In fact, if anything, the opposite pattern exists in the year-to-year data. The lowest detection rates (5%) correspond with the shortest travel time (25 days), while the highest detections (30%) correspond with the longest travel time (50 days).

A second germane outcome of the recent research is that summer flow augmentation may have a negative effect on juvenile fall chinook migrating from the Clearwater River below Dworshak Dam. Researchers indicate (Conner 1995) that reduced water temperatures in the Clearwater River reduced the growth rate and delayed migration

Figure 11. Juvenile Fall Chinook Run-Timing at McNary Dam Versus the Percent of the Corresponding Adult Returns Based on PIT Tag Detection History



timing of fall chinook juveniles. This change in migration timing may have contributed to reduced detection rates, and possibly survival, in 1994.

Still, under low flow conditions, summer water temperatures in the Lower Snake River can exceed 74 F. (Bennett, et al., 1997), a temperature level that can be lethal to chinook salmon survival. Researchers have documented that flows from Dworshak Reservoir can be used to lower water temperatures to levels more favorable (< 70 F.) for both juvenile and adult survival (Bennett, et al., 1997). But researchers have been unable to determine the change in juvenile survival resulting from decreased water temperatures or the amount of water needed to achieve survival changes.

The lack of precision in current fall chinook survival estimates is caused by many factors, including inadequate analysis tools, inadequate sample sizes, and the extended migration timing of the fish themselves. As research continues, future studies will provide data to judge more accurately the merits of flow augmentation.

To conclude, the results of recent PIT tag analyses, as well as other analyses surrounding the benefits of increased flows, serve as a warning to fish managers not to jump to expedient conclusions regarding flow impacts to fall chinook survival.

5.5. The Delayed Mortality Issue and Models.

Although the previous data supporting a strong flow-survival relationship has been largely discounted, the debate on the impacts of flow still remains and has been recast in terms of the impact of mortality in the hydro system, influencing mortality in the estuary and ocean. This mortality has been termed "delayed" mortality. Again, hypotheses on the effect of flow on this delayed mortality divide into two camps: one in which flow has a strong influence on delayed mortality (tribal-agency FLUSH/delta model analyses); and another in which flow has a weak influence on delayed mortality (University of Washington, CRISP/alpha model analyses).

The decades old argument on the value of flow may now depend on which model system is a better representation of the Columbia River and their salmon stocks. This evaluation is taking place through the regional PATH process, where arguments for and against each model system are being developed and will be reviewed by independent scientists. The merits of each model system will be judged on how well they fit the existing data and their ecological realism.

But the University of Washington analyses have identified technical issues within the FLUSH/delta model system, including: 1) a weak fit of FLUSH to in-river survival studies; 2) the lack of a well-defined biological basis for connecting hydro system mortality to delayed mortality; and 3) the use of historical data without accounting for the unique factors contributing to the historically poor passage conditions.

In general summary, flow augmentation is likely to have limited benefits as a tool for salmon recovery. Previous claims of large benefits for flow augmentation have been overestimated. What remains of the contention for a strong flow-survival relationship is now being addressed in the PATH process.

5.6. CRISP Modeling Analyses Results.

To provide some additional insight into the flow-survival relationship, the results from CRISP modeling analyses, surveying different flow augmentation levels, are presented within Tables 3-4 and Figures 12-13. These modeling analyses match closely the survival relationships within the mainstem Snake-Columbia River corridor exhibited by the NMFS spring/summer chinook data and the available fall chinook data sets.

In Table 3 and Figure 12, the modeling analyses suggest that spring migrant survival rate improvements—gained by incremental flow enhancement—are generally small. During a low water-year condition, the absolute change in Snake River fish survival would be about 2.3% (56.9% survival to 59.2%), with 6.5 MAF of flow augmentation (flow augmentation from both the Snake and Columbia river systems). During average water-year conditions, the absolute change in survival would be about 1.4% (59.2% survival to 60.6%).

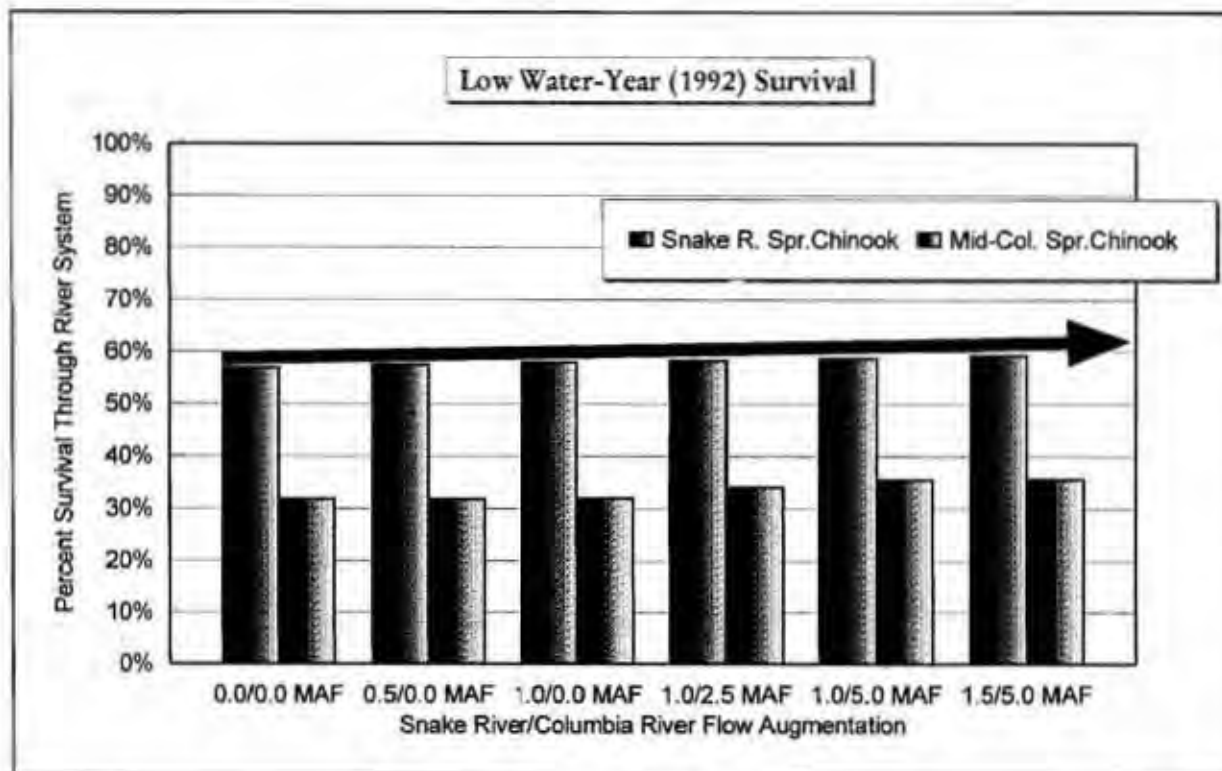
As portrayed within Table 4 and Figure 13, the fall chinook survival estimates, with flow augmentation, are higher than the estimates for spring chinook. This is true for both absolute survival improvements and for incremental percentage increases, because of the lower overall survival rates of the migrating fall chinook. The range of absolute change is about 2-4% for Snake River fall chinook and Mid-Columbia fall chinook. But the incremental percentage change in survival for the Mid-Columbia fall chinook is about 40%.

The fall chinook modeling analyses in Table 4 and Figure 13 are preliminary and are based on high range value estimates (data sets); but they are presented here with the recognition that work on the fall chinook is still incomplete. Other modeling analyses of the fall chinook data produces estimates of far less elasticity between incremental flow augmentation and survival increases, within years.

Also, it is important to note that these flow-based survival rate improvements are influenced by other recovery plan measures—most importantly being the juvenile transportation program. As higher percentages of fish are removed from the river system due to transportation program operational changes, the effectiveness of the flow augmentation program for mainstem survival diminishes.

Snake River summer flow augmentation is currently being used to enhance the transportation collection efficiency for fall chinook. But flow augmentation is not the only method available to increase collection efficiency. Structural changes at the projects, such

Figure 12. Spring Chinook Survival Estimates



**Table 3. Estimated Impacts to Mainstem Survival
University of Washington CRISP 1.5 Analyses**

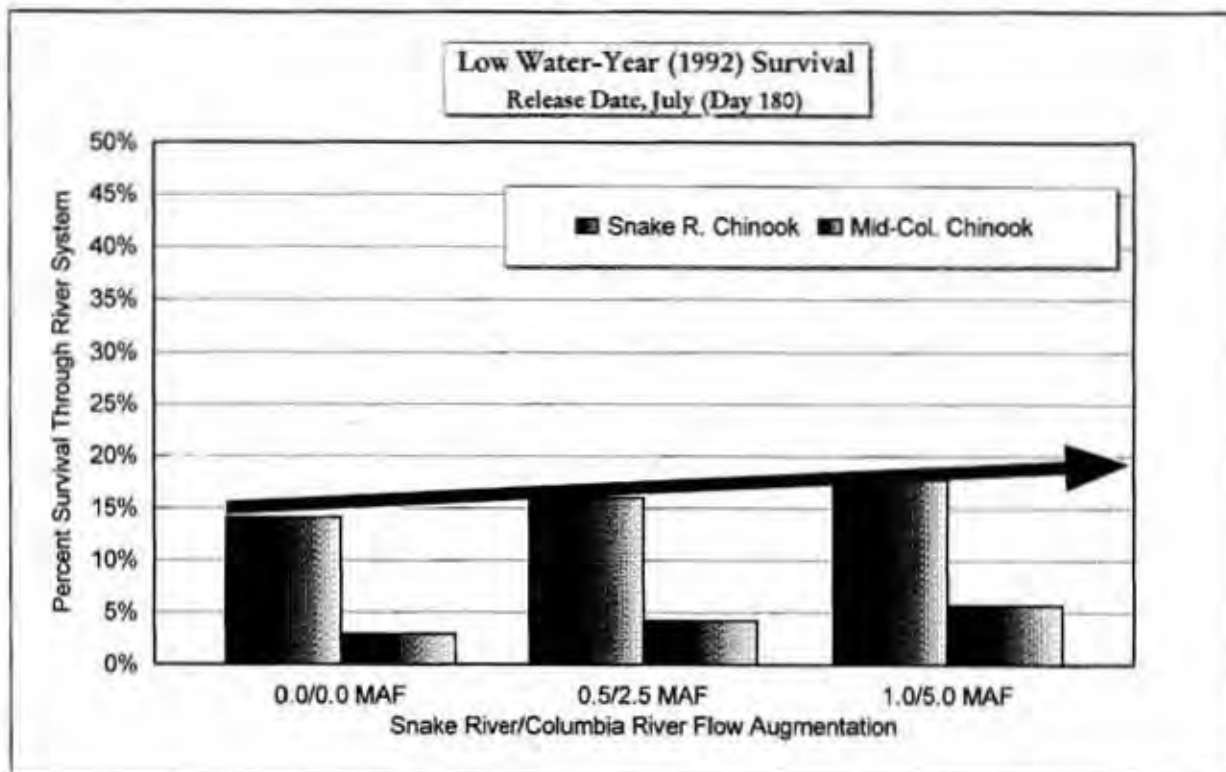
Flow Augmentation under 1995 BIOP Operations with Juvenile Salmon Transportation Survival From L. Granite Head-Water to the Estuary					
Estimated Survival:					
Flow Augmentation At:		Low Water Year (1992) Spring Chinook		Raw Score Percent Increase	
<u>Snake R.</u>	<u>Columbia R.</u>	<u>Snake</u>	<u>Mid-Columbia</u>	<u>Snake</u>	<u>Mid-Columbia</u>
0.0 MAF	0.0 MAF	56.9%	31.7%	-----	-----
0.5 MAF	0.0 MAF	57.4%	31.8%	0.5%	0.1%
1.0 MAF	0.0 MAF	57.9%	31.9%	1.0%	0.2%
1.5 MAF	0.0 MAF	58.5%	31.9%	1.6%	0.2%
1.0 MAF	2.5 MAF	58.3%	34.0%	1.4%	2.3%
1.0 MAF	5.0 MAF	58.6%	35.5%	1.7%	3.8%
1.5 MAF	5.0 MAF	59.2%	35.5%	2.3%	3.8%
No Transportation, In-River Survival Only					
0.0 MAF	0.0 MAF	35.8%	31.7%	-----	-----
0.5 MAF	2.5 MAF	36.8%	33.9%	1.0%	2.2%
1.0 MAF	5.0 MAF	37.7%	35.5%	1.9%	3.8%
Estimated Survival:					
Flow Augmentation At:		Average Water Year (1995) Spring Chinook		Raw Score Percent Increase	
<u>Snake R.</u>	<u>Columbia R.</u>	<u>Snake</u>	<u>Mid-Columbia</u>	<u>Snake</u>	<u>Mid-Columbia</u>
0.0 MAF	0.0 MAF	59.2%	36.3%	-----	-----
0.5 MAF	0.0 MAF	59.7%	36.3%	0.5%	0.0%
1.0 MAF	0.0 MAF	59.4%	36.3%	0.2%	0.0%
1.5 MAF	0.0 MAF	59.9%	36.3%	0.7%	0.0%
1.0 MAF	2.5 MAF	59.8%	38.3%	0.6%	2.0%
1.0 MAF	5.0 MAF	60.1%	39.8%	0.9%	3.5%
1.5 MAF	5.0 MAF	60.6%	39.8%	1.4%	3.5%
No Transportation, In-River Survival Only					
0.0 MAF	0.0 MAF	37.8%	36.3%	-----	-----
0.5 MAF	2.5 MAF	38.8%	36.3%	1.0%	2.0%
1.0 MAF	5.0 MAF	39.8%	39.8%	2.0%	3.5%

Data/Analyses Sources:

Columbia Basin Research Office, University of Washington, CRISP 1.5 Analyses, August-December 1997.

Note: The flow augmentation scenarios are for water released into the Snake and Mid-Columbia headwaters over a 60-day period during the migratory season.

Figure 13. Fall Chinook Survival Estimates
High Range Survival Rate Values



**Table 4. Estimated Impacts to Mainstem Survival
University of Washington CRiSP 1.5 Analyses**

Flow Augmentation under 1995 BIOP Operations with Juvenile Salmon Transportation Survival from the Lower Granite Head-Water to the Estuary					
Estimated Survival:		Low Water Year (1992)		Raw Score	
Flow Augmentation At:		Fall Chinook		Percent Increase	
<u>Snake R.</u>	<u>Columbia R.</u>	<u>Snake</u>	<u>Mid-Columbia</u>	<u>Snake</u>	<u>Mid-Columbia</u>
		High-Range	High-Range	High-Range	High-Range
		<u>Value</u>	<u>Value</u>	<u>Value</u>	<u>Value</u>
<u>Release Date: July (Day 180)</u>					
0.0 MAF	0.0 MAF	14.1%	2.9%	-----	-----
0.5 MAF	2.5 MAF	16.0%	4.2%	1.9%	1.3%
1.0 MAF	5.0 MAF	17.8%	5.7%	3.7%	2.8%
<u>Release Date: Day 200</u>					
0.0 MAF	0.0 MAF	10.4%	2.3%	-----	-----
0.5 MAF	2.5 MAF	12.2%	3.0%	1.8%	0.7%
1.0 MAF	5.0 MAF	13.8%	3.9%	3.4%	1.6%

Estimated Survival:					
Flow Augmentation At:		Average Water Year (1995)		Raw Score	
		Fall Chinook		Percent Increase	
<u>Snake R.</u>	<u>Columbia R.</u>	<u>Snake</u>	<u>Mid-Columbia</u>	<u>Snake</u>	<u>Mid-Columbia</u>
		High-Range	High-Range	High-Range	High-Range
		<u>Value</u>	<u>Value</u>	<u>Value</u>	<u>Value</u>
<u>Release Date: July (Day 180)</u>					
0.0 MAF	0.0 MAF	26.4%	9.3%	-----	-----
0.5 MAF	2.5 MAF	28.0%	11.5%	1.6%	2.2%
1.0 MAF	5.0 MAF	29.4%	13.7%	3.0%	4.4%
<u>Release Date: Day 200</u>					
0.0 MAF	0.0 MAF	23.1%	5.8%	-----	-----
0.5 MAF	2.5 MAF	25.5%	7.2%	2.4%	1.4%
1.0 MAF	5.0 MAF	27.2%	8.8%	4.1%	3.0%

Data/Analyses Sources:

Columbia Basin Research Office, University of Washington, CRiSP 1.5 Analyses, August-December 1997.

Note: The flow augmentation scenarios are for water released into the Snake and Mid-Columbia headwaters over a 50-day period during the migratory season.

Data for fall chinook migrations is more limited than for spring chinook; as such, the above survival estimates reflect high range values--for flow augmentation response-- that are under continued review and evaluation.

as the current installation of double-length screens and/or surface collector technology, may be able to achieve the same goal, more cost-effectively, and provide benefits for spring migrants as well.

5.7. Ecological Considerations Concerning Flow and Mainstem Passage.

The scientific protocols used for determining a survival versus flow relationship are to mark juveniles during migration, recapture them as older juveniles or as adults, plot their survival rate against some estimator of flow they experienced during migration, and calculate a regression statistic. Since this has been done for many groups of fish over many years and by many scientists, the results, not surprisingly, are variable (see, for example, the Cada et al., 1994 review and the studies cited in Appendix A). But probably the best data we now have is the NMFS PIT tag data base (Smith, et al., 1997a).

Beginning in 1993, NMFS and University of Washington researchers combined state-of-the-art PIT tag technology with sound statistical study design to quantify the relationship between juvenile migration survival and flow discharge in the Snake River. These data are now being collected under improved in-river test conditions of high spill and flow, as prescribed by NMFS in the 1995 BIOP. Smith, et al., (1997a) have published NMFS findings to date, covering multiple-year flow conditions data.

The results of the multi-year juvenile survival data in the Snake River probably give us the most definitive picture of how flow affects spring chinook and steelhead migrating through the Lower Snake and Lower Columbia hydropower corridor. Key points from the NMFS data come readily to light.

When comparing juvenile survival between years, there is higher survival in years with higher flows. This parallels the findings of Sims and Osslander (1981), a study whose data have been criticized as statistically inadequate (see Kreeger and McNeil, 1992; Steward, 1994). Among other considerations, the inter-annual relationship seems to depend on the fact that there are very large differences in seasonal discharge from year-to-year—larger than we observe in weekly or monthly variations within each year. Examination of the data tends to suggest that it may not be the provision of higher flows that elicits the survival benefit.

In reviewing these data, it appears that for years when the average spring discharge is below 80-90 kcs in the Snake River, survival is much lower than when it is above this value. Smith, et al., (1997a) characterize this phenomena well. In particular, the *within year* survival data strongly suggest that there is no apparent relationship between survival and flow. The biological or physical cause of why there is a strong between-year survival relationship, but no within-year relationship, is speculative; it is likely based in ecological factors that are well beyond the effects of the single flow rate variable.

For example, an examination of week-to-week survival of migrating juveniles indicates that the specific weekly discharge does not seem to greatly influence survival. That is,

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in examining the flow-survival relationship within a specific year, the same kind of strong relationship does not manifest, as noted between years. Is it possible that this situation exists because there is not a significant change in flows from week-to-week to elicit a survival response?

In answering this question, it can be observed that flows within a season can vary by as much as 50 to over 100 kcfs (see Figure 10). Thus, it can be said that fish are exposed to highly variable flows within a year. It is not unusual to see Snake River flows at the beginning of the season at 40-60 kcfs and reach 120-140 kcfs as run-off proceeds. Snake River discharge history from 1994-1997 illustrates this point well. In 1994, flows began near 30 kcfs but never exceeded 100 kcfs—a very low flow year. In 1996, by contrast, flows began around 90 kcfs and peaked near 200 kcfs. In both years, flows fluctuated greatly within the season (sometimes within a week), yet no survival relationship emerged. Both years presented natural experimental opportunities for survival to show weekly fluctuations, because flow conditions were often highly variable week-to-week. But the survival data do not correspond to the flow variations. This observation suggests that survival is not a function of week-to-week discharge; it is not the instantaneous flow condition that is providing a measurable survival benefit. Instead, it appears that it is the overall annual condition of low flow (drought) versus high-flow (flood) years. Seasonal, not daily or weekly, volume water discharge is a predictor (or a correlate) of annual in-river survival percentages—likely due to multiple variables stemming from wet seasons versus dry years.

Consider, as well, even if total seasonal discharge was the only variable driving survival—an unlikely assumption—is it possible to “turn a low-flow year into a high-flow year” by using reservoir storage and thereby increasing survival? If we compare the volume of water that passed Lower Granite Dam in the spring of 1994 and 1996, we find that total river flow in 1996 (14.6 MAF) was nearly twice that of 1994 (7.6 MAF). In order to make river conditions in 1994 resemble 1996, it would require an additional 7 MAF of flow augmentation. Currently, the total Snake River storage is about 12 MAF (System Operations Review estimate). Therefore, we would need to evacuate two-thirds of the entire storage in Idaho and release it in a two-month period. Even if this were hydrologically possible, it would leave negligible storage or available instream flows for other purposes; and the region would need to forego most uses for water later in the year, including fish and wildlife in the Middle and Upper Snake River.

It appears likely that the use of storage as a mitigation tool is relatively limited in how much increased in-river survival it can provide, within the hydropower corridor. A major objection to previous juvenile survival data has been inadequate in-river conditions to maximize in-river survival. NMFS has provided improved conditions to test this hypothesis since 1993, in the form of both higher spill and flow target levels.

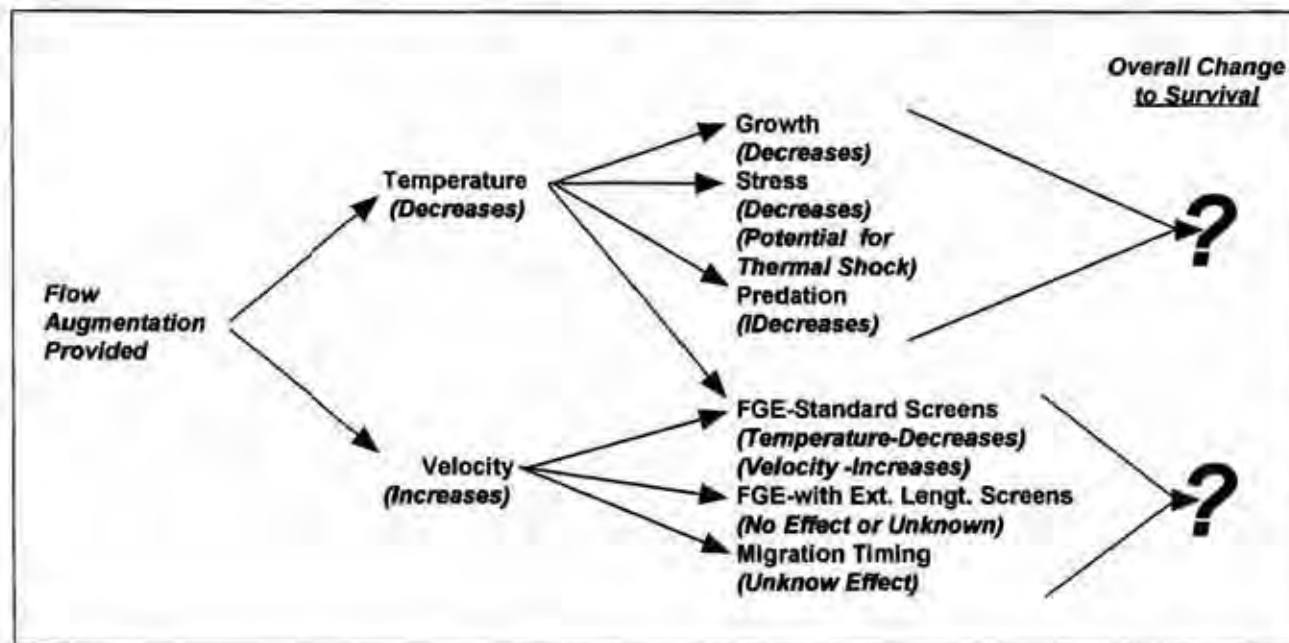
Based on their own data, the NMFS recovery strategy should anticipate that survival of juveniles will vary year-to-year, and survival appears to be contingent especially on whether we anticipate a drought year and therefore low survival in-river. For now, it appears that flow as a tool to enhance in-river survival of spring migrants, within seasons, has severe limitations in the Snake River; and that the survival benefits of simply drafting

storage will be small, first by storage limitations themselves, and second by the survival benefits—no matter what we may be willing to pay biologically or economically in the way of upstream costs. The benefits to fall chinook are less understood and flow may offer some benefits (undefined at the present time) during the summer migration season. This appears to be hydrologically possible and holds more promise than the current program of enhanced flows during the spring runoff. It also is recommended that appropriate monitoring and evaluation continue.

Summary Observations and Comments:

- Largely based on historical data depicting year-to-year flow and juvenile fish survival relationships, it has been assumed that flow augmentation could be used to increase flows during low water-year conditions, in an attempt to produce survival rates observed in high water years.
- Data collected for spring migrants since 1992 (NMFS 1993-1997 data sets) indicate that the *within year relationship* between different flow regimes and fish survival through the hydro system corridor is weak. This means that attempts to use flow augmentation to improve spring migrant survival will provide very little or limited benefits.
- The year-to-year correlations between flow and survival—reflecting vastly different flow levels between years—support the hypothesis that ecological factors associated with drought conditions are principally responsible for fish survival.
- The year-to-year observations move toward the conclusion that better water-year conditions, in general, provide for greater fish survival than drought conditions.
- The flow-survival data collected on fall chinook is more variable and less well defined than for spring migrants. Several variables and factors affect overall survival, including growth, stress, predation, migration timing and rearing, and changes to FGE at the Lower Snake River projects (see Figure 14).
- Given the existing data, flow is one variable correlated with survival in some cases, but it has less predictive capability than other variables (such as migration timing and fish size through the upper river system). Also, some relationships, such as observed numbers of marked fish detections between years, are inconsistent with the flow-survival hypothesis within years.
- During the summer period, Lower Snake River water temperatures can and do exceed levels that negatively affect migrating juveniles and adults. The use of some flow augmentation (from Dworshak Reservoir) to improve migration conditions should continue to be reviewed; and the biological benefits and costs should be better understood.

Figure 14. Factors Affecting Fall Chinook Survival and Flow Augmentation



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- Snake River summer flow augmentation is being used to enhance the transportation collection efficiency for fall chinook. But it is yet to be verified by empirical data, beyond the detection rate data. Flow augmentation is not the only method available to increase collection efficiency. Structural changes at the projects, such as the current installation of double-length screens and/or surface collector technology, may be able to achieve the same goal, more cost-effectively, and provide ancillary benefits for spring migrants as well.
 - For the spring period (May-June), pulsed flows (small water volumes) should be reviewed for potential experimentation as a migratory stimulator, primarily to benefit fish leaving the Salmon River tributary and entering the mainstem Snake River system—as recommended jointly by federal and state fish and water resources managers.
 - Flow augmentation may hold some incremental benefits (undefined) for improving fall chinook survival. *However, resource managers should exercise great caution before increasing flow levels beyond the program levels employed in 1994 (summer flow augmentation) given existing uncertainties.*

6.0. *Economic Trade-Offs of Flow Augmentation.*

6.1. *Direct Net Value Measures of Economic Change.*

In evaluating actions affecting the hydro system and related operations, both net economic costs and benefits should be considered. If an action's net benefits exceed costs relative to other hydro system impacts, then society (the region) has received a monetary gain to overall net social welfare. The region is not being economically "penalized" by this allocation of resources—use of river water—but enjoys a net economic benefit.

Real changes to economic efficiency are measured in terms of direct net value. *Direct value* refers to the economic benefits derived from primary economic activities or sectors, such as: the crop value of irrigated agriculture; the marginal value (or opportunity costs) of electric power; or the ex-vessel or sport-effort value of commercial and sport salmon fishing. *Direct net value* represents the net benefits (monetary dollars) derived from primary activities, over and above the cost of providing or engaging in such activities.

For irrigated agriculture and commercial fisheries, direct net value (benefits) represents monetary returns above costs to proprietors and management. For sport fishermen, net value reflects willingness-to-pay to enjoy the sport activity above actual costs. For the hydro power sector, direct net value (costs) would be foregone electric power generation due to water reallocations (the loss of power revenues due to changes in hydro system operations).

Direct net value is recognized by the (National) Water Resources Council, the System Operation Review EIS (Corps 1995) economic workshop group, the NMFS Economics Technical Committee (Hubbert 1996), and the Corps Drawdown Review Economic Workshop group as an appropriate economic measure for assessing net economic impacts or changes to the region's (and nation's) social welfare. Direct net value is the best measure to use in understanding an activity's true economic benefits and costs; it can be used to assess and standardize the relative benefits and costs of different types of economic activities.

6.2. *Flow Augmentation Impacts.*

In the case of flow augmentation impacts, dedicated water volumes for flow augmentation reduce the amount of water available for system hydroelectric power production; and under some circumstances or scenarios, the fish flows could restrict the amount of water available for irrigated agriculture. For hydropower impacts, the economic value of this direct net cost can be measured in terms of dollars per acre-feet of water (dedicated for flows), taking into account average power generation losses throughout the system during the flow augmentation period. The direct net value of irrigation losses can be calculated on a dollars per acre-feet basis, as well, relying on a range of regional value estimates.

The Bonneville Power Administration has prepared power cost estimates associated with the flow augmentation program (BPA 1997), reflecting several variables affecting system-wide costs and changing power prices, during different types of water-year conditions. This estimate suggests a direct net cost of about \$8-10 million per one million acre-feet of flow augmentation (BPA system costs). For irrigated agriculture impacts, a net benefit range estimate of about \$40-70 million per one million acre-ft of water is available (NEA 1997; Olsen 1996a; Olsen 1996; and Hamilton and Whittlesey 1996).

The direct net economic benefit for fish flows can be calculated by using an estimated increase in survival due to flow augmentation, for all Columbia River stocks, and using sport and commercial fishing values as representing a realistic (or measurable) economic value for the runs. For a favorable baseline condition (average annual run size during the 1987-1991 period), the System Operation Review EIS (Corps 1995) provides a direct net value estimate of about \$25 million, for the sport and commercial value of all up-river origin (above Bonneville Dam) salmon and steelhead. If the average survival rate (incremental) effects from the multi-year flow augmentation program are assumed to be about 5%—based on CRISP modeling runs—and the effects are “compounded” for ten future life-cycles, then a direct net benefit estimate would be about \$2.25 million per one-million acre-feet of flow augmentation. This dollar value estimate represents a *future value estimate—as opposed to an annualized present value estimate—and should be considered as reflecting a high value perspective for comparison purposes here.*

The value estimates for comparing the direct net economic trade-offs of flow augmentation versus irrigation and hydro power operations are provided in Table 5. These estimates indicate that even when favorable assumptions are applied to the estimation of the flow program, the direct net fish benefits do not exceed the costs to hydro power production or irrigated agriculture. This would indicate that the region receives negative economic trade-offs when relying on flow augmentation.

Additional studies are being prepared to address other economic benefits and costs associated with the flow augmentation program—in addition to those identified in Table 5. For example, there are recreation sector costs at the Upper Columbia-Snake River Basin storage projects that are not included in Table 5; and potential recreation benefits or other environmental benefits are not included. As well, the values presented in Table 5 do not take into account any costs or benefits incurred between sectors—like irrigation and hydropower—that could occur through joint operations or increases to efficiency. For example, Hubbert and Fluharty (1996) estimated an average annual cost of 1 MAF of flow augmentation from Idaho (Snake Basin) at about \$49 million—with additional hydro power production benefits included (this cost is clarified in Hamilton and Whittlesey 1996). Also, the USBR has estimated that a permanent acquisition of .427 MAF from the Upper Snake Basin could remove 425,000 acres from production, with an acquisition cost of \$294 million (depending on reservoir refill requirements).

Still an initial review provided here suggests that it is ever-more-important to structure the flow augmentation program in a way that will prioritize or optimize program

**Table 5. Estimated Economic Benefits of Water Use
For Major Sectors and Types of Economic Sector Trade-Offs
(Direct Net Economic Value Estimates)**

Economic Sector/Purpose	Estimated Benefits Annual \$/MAF	Economic Trade-Offs For Water Diversion
Irrigated Agriculture*	\$40-70 Million	Reduces water for hydropower production and fish flow augmentation.
Hydroelectric Power**	\$8-10 Million (BPA System Costs)	Reduces water availability for fish flow augmentation; could conflict with irrigated agriculture.
Flow Augmentation--Fish Impacts Estimated Sport and Commercial+ Fisheries--Columbia Basin Origin (High Value Estimate)	\$2.25 Million	Flow augmentation reduces hydropower production and can affect irrigated agriculture under NMFS BIOP-Recovery Plan.
Flow Augmentation--Fish Impacts Estimated Use and Existence++ Values for Columbia River Basin Salmon and Steelhead	\$4.80 Million	Flow augmentation reduces hydropower production and can affect irrigated agriculture under NMFS BIOP-Recovery Plan.

* Assumes Direct Net Value of \$40-70/acre ft. of water.

** Estimated marginal power cost impacts to Bonneville Power Administration.

+ Assumes baseline economic value of \$25 million (1995\$), with compounding future value of 5% attributed to flow augmentation, for 10 migration periods (with average annual flow augmentation of about 7 MAF). The value represents a future value estimate and should be considered as presenting a high value perspective for comparison purposes here.

++ Assumes "total value" estimate (use, option and existence value) based on Columbia Basin Salmon and Steelhead study for use and non-use values; assumes that about 53% of the total value would reflect existence value (Olsen and Richards 1991). Use value based on future value estimate.

Data and Analyses Sources:

D. Huppert and D. Fluharty, Economics of Snake River Salmon Recovery: A Report to the National Marine Fisheries Service, School of Marine Affairs, University of Washington, Seattle, Washington, 1996 (and data/sources cited therein, SOR EIS).

Personal communications with Dittmer Operations staff, Bonneville Power Administration, Vancouver, Washington, August-September 1997.

D. Olsen, The Columbia Basin Project: Project Operations and Economic Benefits, A Regional Overview, The Pacific Northwest Project, Kennewick, Washington, 1998 (and Technical Memorandum Prepared for the Public Purposes Work Group of the Comprehensive Energy Review, 1996, Evaluating Irrigation, Power System, and Flow Augmentation Benefits and Costs).

J. Hamilton and N. Whittlesey, Cost of Using Water from the Snake River Basin to Augment Flows for Endangered Salmon, Paper Presented at the Annual Western Regional Sciences Association, Napa, California, February 1996.

implementation. The economic trade-offs (costs) of the program are, and could be, substantial. From an economic trade-off perspective, the program should be implemented to prioritize fish benefits, while acknowledging significant economic constraints and reducing costs to other sectors.

6.3. Cost-Effectiveness Analyses for Salmon Recovery Measures.

Another economic perspective that is being brought to bear on salmon recovery policy involves cost-effectiveness analysis. Flow augmentation is only one of several measures being pursued by the region to protect and enhance fish resources. And it is not unexpected to ask the question: how does flow augmentation compare to other recovery actions?

While detailed, quantitative cost-effectiveness reviews have been completed (Olsen and Anderson 1994) and are being undertaken to estimate the benefits of flow augmentation (and within the Corps' Lower Snake River Drawdown EIS), the subject can be investigated briefly within this paper using some basic qualitative and quantitative indicators. A framework for reviewing these indicators is presented in Table 6.

This framework assesses recovery measures according to six criteria or observations: 1) the measure is operational or currently being implemented; 2) empirical data is available to evaluate measure performance; 3) using empirical data, the measure is or can be confirmed as effective; 4) the measure's potential impact on survival is measured across one life-cycle; 5) the measure's estimated economic cost is identified; and 6) the maximum economic risk of pursuing the measure is considered.

With regard to the first three criteria, flow augmentation is operational, empirical data has been collected, but flow augmentation's range of effectiveness is uncertain. The NMFS within-year data and CRISP modeling analyses discussed in previous sections would suggest limited to uncertain levels of effectiveness, particularly for spring migrants. With regard to cost, flow augmentation is similar to the incremental costs associated with a full transportation improvement scenario, with increased collection efficiency and direct loading facilities included within transport costs. It is more costly than measures like the law enforcement program or turbine improvements, but it is less costly than proposed Snake River reservoir drawdowns. These dollar costs also define the level of maximum economic risk, if the measures fail to perform.

In terms of dollar cost per unit of measured survival benefits, across one life-cycle, flow augmentation benefits could fall within the \$16-92 million dollar range per 1% increase in survival, for spring chinook. This range is based on CRISP modeling analyses and the assumptions discussed in Table 6. For example, the dollar per survival improvement range for flow augmentation suggests that it is likely more cost-effective (and less risky) than a reservoir drawdown measure, but it would be less cost-effective than

**Table 6. Cost-Effectiveness Review
For Salmon Mitigation and Recovery Measures**

Measure	Measure Is Operational	Empirical Data Exists for Review	Effectiveness Confirmed	Estimated Incremental Increased Survival+	Estimated Annual Cost+	Est. \$ per 1% Survival Improv.	Maximum Economic Risk
Flow Augmentation	Yes	Yes	Uncertain Results	1 to 4% (Snake Sp.Chin.)	\$56-70 Mil./Year (Ave. 7 MAF/Year)	\$14-70 Mil.	(>\$50 Mil. Loss)
Turbine Improvements	Being Installed or Reviewed	Yes	Generally Effective	1 to 3% (Snake Sp.Chin.)	\$10-20 Mil./Year	\$4-20 Mil.	(<\$25 Mil. Loss)
Snake R. DD 4-Pool Nat. R.	No (5 Years)	No	No, But Definite In-River Improv.	-28% to 72%** (Snake R. Fish)	\$150-250 Mil./Year***	>\$2 Mil.	(>\$100 Mil. Loss)
Surface Collectors	No* (Experimental)	Yes (Limited Data)	No* (Experimental)	0-9% (Snake Sp.Chin.)	\$32-40 Mil./Year 2 to 4 Projects	>\$4 Mil.	(<\$50 Mil. Loss)
Existing Project Spill	Yes	Yes	Uncertain Results At High Levels	0-8%++ (Snake Sp.Chin.)	\$40-60 Mil./Year	>\$5 Mil.	(>\$50 Mil. Loss)
Snake R. MOP DD	Yes	Yes (Flow-Surv. Data)	No	<1% or Not Measurable	\$20 Mil./Year	>\$20 Mil.	(<\$50 Mil. Loss)
Smolt Transport Improvements (Full Transport)	Yes	Yes	Empirical Data Suggests Yes	10%+++ Total Survival >60% (Snake Sp.Chin.)	\$90 Mil./Year All Improvement Features	\$9 Mil.	(>\$50 Mil. Loss)
Law Enforcement	Yes	Yes	Yes	>0% 319/104 (fish/nets)	\$3-4 Million/Year	<\$3-4 Mil.	(<\$25 Mil. Loss)

Notes:

* Does not include Wells Dam structure on the Mid-Columbia River; refers to existing dam retrofits.

** Depends on assumptions concerning existing smolt transportation program. If program is not more effective than existing in-river conditions, then drawdown would likely produce about 72% gain. If existing program is 100% more effective than existing in-river conditions, then drawdown would reduce survival by about 28%.

*** Cost depends on assumptions about flow augmentation and power/construction costs.

+ Based on data and analyses contained within the Harza, "Salmon Decision Analysis" (1996) Report, and University of Washington Analyses, Aug-Sept., 1997.

++ Depends on assumptions concerning transportation effectiveness.

+++ Assumes that existing transportation program is effective (provides about 100% survival improvement above existing in-river conditions).

Data Sources and Estimates: Harza, "Salmon Decision Analysis" Report (1996); Corps System Operation Review EIS (1995); Corps System Configuration Study, Phase I (1994) and Interim Status Report (1995); BPA Loads and Resources (1995); Harza-BPA Technical Memorandum, July 1997; University of Washington CRISP 1.5 Model Analyses, Aug.-Sept., 1997; and Harza and Pacific Northwest Project (1997).

transportation program improvements, if the existing NMFS transportation benefit estimates are correct.

So in taking into account some fundamental cost-effectiveness criteria, given available data and assumptions, this economic perspective also would encourage resource managers to optimize the use of the flow augmentation program. Flow augmentation costs directed toward limited or undefined survival benefits detract from an ability to allocate finite dollars to more beneficial salmon benefit measures, or other types of mitigation and compensation strategies.

Summary Observations and Comments:

- Using sport and commercial fisheries value and fish abundance estimates for the 1987-1991 period, the annual direct net value of the upriver (above Bonneville Dam) salmon and steelhead contributions to ocean and in-river fisheries is about \$25 million.
- Applying some favorable economic and biological assumptions to the benefits of flow augmentation, the annual direct net economic value of the upriver contributions to commercial and sport fisheries is about \$2.25 million per one million acre-feet of water used for flow augmentation—representing a *future value* estimate over 10 life-cycles (1995\$).
- Flow augmentation does cause economic impacts to hydroelectric power operations and could create future economic impacts to irrigated agriculture. For one million acre-feet of flow augmentation, the cost to hydropower operations is estimated to be about \$8-10 million (BPA system costs). For irrigated agriculture across the Columbia Basin, the value of one million acre-feet of water is estimated to be about \$40-70 million; one estimate (Huppert and Fluharty 1996) for the Upper Snake River Basin suggests about \$49 million per one million acre-feet of water provided for flow augmentation (includes hydropower benefits).
- Both economic trade-off analyses and cost-effectiveness analyses strongly support the position that *any flow augmentation program should be optimized to maximize fish benefits relative to the costs incurred to other water resource sectors.*

7.0. Recommendations for Decision Makers.

7.1. The NMFS Water Policy.

The NMFS water policy—bred from the flow targets/augmentation program—directs that all future (new) water allocations from the Columbia River Basin drainage area should be used solely for fish protection.

The NMFS water policy is a single-purpose, resource use strategy that subjugates new water withdrawals for other types of social and economic activity or growth within the Basin. The policy is one-dimensional in nature, and it directly or indirectly challenges state legislative authority to govern water management.

The NMFS senior management, working with state water resource managers, should reevaluate and change this policy to better reach the needs of biological and economic optimization.

7.2. Review and Restructure the Flow Targets/Augmentation Program.

The river system benefits of flow augmentation are best estimated by relying on NMFS/UW data for flow-survival relationships (1993-1997 data), the CRISP modeling analyses (which corroborate the NMFS/UW data), as well as other data and analyses being developed for fall chinook impacts. These data and analyses strongly suggest that the correlation between incremental flow changes and juvenile spring migrant survival is relatively inelastic, or that the survival benefits are small. *Flow benefits are best considered by examining the within year data relationships.*

To date given the data available, estimated river system flow benefits—though limited—appear to favor fall chinook. But the uncertainty surrounding the effects of flow augmentation on overall fall chinook survival is great. Several factors are unclear or unresolved concerning direct inriver survival benefits within years, migration timing and flow conditions, and the use of flow to improve transport collection efficiencies. It is more clear that flow augmentation is a measure providing marginal survival benefits, while factors independent from the mainstem river system, such as ocean/climatic conditions, will govern total productivity levels.

In contrast to some of the biological impacts, the economic trade-offs of flow augmentation are more predictable. Flow augmentation does increase costs to the hydropower system—one of the single largest costs of the salmon recovery program—and it could create significant costs to the irrigation (and other) sector, through either direct water curtailments or abrogating state water permits.

It should be further underscored that the flow augmentation program is directly affected by the collection efficiency of the smolt transportation program. Under a full or

"maximized" transport collection program, the flow augmentation benefits within the mainstem corridor become very limited. For example, in the case of Snake River spring chinook collection at Lower Granite and Little Goose dams, 80% collection efficiencies will leave less than 5% of the migrating fish within the river system (below Little Goose Dam). If transport collection efficiencies improve at the McNary Project, then the flow benefits for Mid-Columbia fall chinook will decrease as well. And as technical modifications are made at the collection facilities to improve fish guidance, the upriver effects of flow augmentation to improve fish guidance are diminished.

Given the data, analyses, and observations noted above and presented throughout this paper, the following review and changes are suggested for the flow augmentation program.

Optimization Review:

- The existing flow augmentation program does not optimize water use for either survival benefits (benefit per unit of flow) or economic costs (benefit per dollar cost) to the river system. This optimization review should include changes to hydro system management, requiring new hydro regulation analyses.
- The flow augmentation program would benefit from a detailed technical review that focuses on the *optimization of water use. This would include applying principles of cost-effectiveness, to compare the biological benefits gained for the costs incurred.*

A restructured flow augmentation program that better reflects a step toward optimization of the existing water resources is described below:

Low Water Conditions, Snake River System:

- For the summer period (July-August), provide for experimentation a *maximum of 0.5 MAF* from the Brownlee Project and above consistent with state law and obtained from willing sellers or lessors; and a *maximum of 1.0 MAF* from Dworshak to be used for fall chinook migration and/or adult temperature control. Data to review this experimental regime would be collected through 1999, consistent with the existing NMFS decision-making process.

Low Water Conditions, Columbia River System:

- Direct flow augmentation releases solely for the fall chinook migration. For the summer period (July-August), provide for experimentation *0-4.0 MAF, as recommended jointly by federal and state fish and water resources managers.*

Average Water Conditions, Snake River System:

- For the summer period (July-August), provide for experimentation a *maximum of 0.5 MAF* from Brownlee Project and above consistent with state law and obtained from willing sellers or lessors; and a *maximum of 1.0 MAF* from Dworshak to be used for fall chinook migration and/or adult temperature control. Data to review this experimental regime would be collected through 1999, consistent with the existing NMFS decision-making process.

Average Water Conditions for the Columbia River System:

- Direct flow augmentation releases solely for the fall chinook migration. For the summer period (July-August), provide for experimentation *0-4.0 MAF*, as recommended jointly by federal and state fish and water resources managers.

Such restructuring of the flow augmentation program would have the greatest deviation from the existing flow augmentation program by eliminating the current spring flow augmentation regime. But the limited benefits gained from the spring flow augmentation program could be off-set by a full transport regime, particularly during low water-year conditions.

During the summer period, the restructured program would limit flow augmentation in the Snake River Basin to a level not to exceed operations that occurred in the summer 1994 (drought conditions). Without a better technical justification for the summer flow augmentation, resource managers should refrain from attempts to increase this flow regime.

It is equally important that better data and analyses are provided in order to justify adequately the use of water currently being used for summer flow augmentation.

7.3. Future Considerations for Flow Augmentation Management and Evaluations.

It appears clear that using flow augmentation within a single season is not an effective recovery tool for spring chinook migration within the mainstem. What is less clear is whether mainstem flow augmentation is an effective management tool for fall chinook within the mainstem; or how flow augmentation can or should be used to improve survival within tributaries. Given these latter uncertainties and issues beyond the scope of this paper, the following recommendations are provided.

- In the case of Snake River fall chinook, the existing data on collection efficiency (FGE) and its relationship to flow is difficult to interpret. The need exists to establish data that verifies the interaction between flow augmentation and structural

improvements to FGE, and cost-effectiveness analysis should be used to assess risk and economic trade-offs.

- Resource managers may want to give consideration to changing the focus of flow augmentation efforts away from mainstem actions to improving habitat conditions within some tributaries. Greater fish benefits may be obtained within tributaries, using less volumes of water. This factor has been generally ignored within the present flow augmentation program. Understanding and optimizing water use in tributary habitats may offer a more biologically productive, and cost-effective approach, to water management.
- Low flow years exacerbate temperature stress to fish in both tributaries and the mainstem. The use of flow augmentation to minimize temperature stress may be beneficial in some habitat areas and applications, but it should be carefully modeled to determine benefits on a *site-specific* basis.
- Drought years are especially difficult for both fishery resources and agricultural enterprises (as well as other economic and industrial water uses). This is particularly true for tributaries and their habitat conditions. The NMFS Recovery Plan should better recognize this factor, and take into account criteria for demonstrating real biological benefits, prioritizing major production tributaries, and measuring the cost-effectiveness and benefit-cost of tributary flow enhancement actions.
- Water use efficiency is an important objective for many water withdrawal sectors within the Columbia River Basin. The use of efficiency measures to accomplish well evaluated flow augmentation actions within tributaries—and support economic activities—should be encouraged.
- *Direct actions to implement flow augmentation measures should defer to the existing authority of state water rights and should allow for "locally developed" solutions within specific watersheds.* This could include an implementation of efficiency measures, water transfers, and the development of new water storage projects to benefit both fish and economic interests.

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APPENDIX A. ANNOTATED BIBLIOGRAPHY

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- 1981 Sims, C.W., and F. Ossiander. 1981. Migrations of juvenile chinook salmon and steelhead trout in the Snake River, from 1973 to 1979, a research summary. US Army Corps of Engineers. Contract DACW68-78-C-0038.
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- 1982 Miller, D. R. and C. W. Sims. 1982. Effects of flow on the migratory behavior and survival of juvenile fall and summer chinook salmon in John Day reservoir. Prepared for Bonneville Power Administration. Contract DE-A179-81BP27602.
- "There was no statistical evidence that to indicate that instream flows effected either the rate of movement or the residence time of 0-age chinook salmon in John Day Reservoir in 1981."
- 1983 Miller, D. R. and C. W. Sims. 1983. Effects of flow on the migratory behavior and survival of juvenile fall and summer chinook salmon in John Day reservoir. Prepared for Bonneville Power Administration. Contract DE-A179-81BP27602.
- "There was no statistical evidence that to indicate that instream flows effected either the rate of movement or the residence time of 0-age chinook salmon in John Day Reservoir."
- 1984 Miller, D. R. and C. W. Sims. 1984. Effects of flow on the migratory behavior and survival of juvenile fall and summer chinook salmon in John Day reservoir. Prepared for Bonneville Power Administration. Contract DE-A179-83BP39645.
- This study was conducted to refine flow/travel time relationships and distributional behavior of 0-aged chinook salmon. "Regression analysis was used to develop a description of the relationship of river flow to the rate of downstream movement... The slope of this line and the correlation coefficient (R) were not significantly different from zero".

- 1989 Anderson, J. A., D. D. Dauble, and D. A. Neitzel. 1989. Smolt survival workshop proceedings of a workshop held at University of Washington Laboratory, Friday Harbor WA. Prepared for Bonneville Power Authority. Project number 87-413 and 86-118, Portland, OR.
- This workshop was held to evaluate measures of juvenile steelhead and salmon survival on the Columbia River. "Speakers noted that uncertainty in the existing survival studies made it difficult to evaluate the effect of river flow on smolt survival. Some doubted that any single factor affecting juvenile survival could be isolated from any other factor, either natural or programmed...Overall, workshop recommendations suggest that current survival estimates have sufficient uncertainty and variability to limit their use in evaluating the effectiveness of the Water Budget Program.
- 1990 Giorgi, A. E., D. R. Miller, and B. P. Sanford. 1990. Migratory behavior and adult contribution of summer outmigrating sub-yearling chinook salmon in John Day reservoir, 1981-1983. Prepared for Bonneville Power Administration. Contract DE-A179-83BP39645.
- This study investigates the effects of river flow volumes on the travel time of sub-yearling chinook salmon migrating through John Day reservoir. Travel time data was largely inconclusive. This was due to poor mark recovery capability coupled with the difficulty of isolating flow from other closely related variables.
- 1991 Berggren, T. J. and Filardo, M. J. An analysis of variables influencing the migration of juvenile salmonids in the Snake and Lower Columbia Rivers. Fish Passage Center. Portland, OR.
- "Smolt travel time estimates for yearling chinook and steelhead released from 1981-1990 in the Snake River, and sub-yearling chinook in the lower Columbia River were inversely related to flow." The authors summarized that the data "...tended to support a causative, rather than a simple correlative relationship, between smolt travel time and river flow." The authors acknowledge that "changes in the level of smoltification development over the outmigration also influences travel time." And "Predicting smolt travel time through key index areas in the Snake and lower Columbia rivers is best accomplished using multiple regression model containing both flow-related and smoltification-related variables".
- 1991 National Marine Fisheries Service. 1991. Factors for decline, a supplement to the determination for Snake River fall chinook salmon under the endangered species act. NMFS environmental and technical services division, Portland, OR.
- This document states that the 1991 system for management of water in the Columbia River basin does not provide flows that move fall chinook salmon sub-yearling migrants expeditiously through the reservoirs.
- 1991 National Marine Fisheries Service. 1991. Factors for decline, a supplement to the determination for Snake River spring/summer chinook salmon under the endangered species act. NMFS environmental and technical services division, Portland, OR.
- This document states that; "In reservoirs, loss of juvenile migrants is closely related to travel

time" No evidence is given to support this statement. The document does cite Raymond 1979 as a source for increased travel time data.

- 1992 Beeman, J. D., and D. W. Rondorf. 1992. Effects of flow and smoltification on the migration rates of spring chinook salmon. . *In*: Passage and survival of juvenile chinook salmon migrating from the snake river basin. Proceedings of a technical workshop., University of Idaho, February 26-28, 1992. Pp91-106.

This study summarizes analyses of gill ATPase activity levels, river flows, and migration times of juvenile spring chinook salmon. The model of spring chinook migration through a Snake River reach, indicates both flow and ATPase activity are important variables in explaining variation in migration time. The gill ATPase variable appeared to be more influential then the flow data, however the years data were collected had a narrow range of flows. With a wider range of flows the influence of the flow variable would have increased.

- 1992 Kreeger, K. Y. and W. J. McNeil. 1992. A literature review of the factors associated with migration of juvenile salmonids. For Direct Service Industries Inc.

The authors review over 90 references and summarize that, "...speed and time of migration are associated with age and size of juveniles as well as with time. Older and larger smolts tend to migrate faster and earlier then younger and smaller smolts. Smolts migrating earlier tend to move more slowly then smolts migrating late."

- 1992 Marsh, D. M., and S. Achord. 1992. A comparison of PIT-tagged spring and summer chinook salmon detection rates with Snake River flows at Lower Granite Dam. *In*: Passage and survival of juvenile chinook salmon migrating from the snake river basin. Proceedings of a technical workshop., University of Idaho, February 26-28, 1992. Pp. 88-90

In 1989, 1990, and 1991 flows at LGD differed substantially during spring salmonid out-migration, "...flow had little effect on the dynamics of the out-migration of hatchery or wild spring/summer chinook populations. There was virtually no difference in fish movement patterns for the three years in each of the three groups of chinook salmon. Since flow at Lower Granite Dam had little effect on the passage pattern of PIT-tagged fish, we believe that other environmental and physiological factors, in addition to flow, influenced the movement patterns of fish."

- 1992 Petrosky, C. E. Analysis of flow and velocity effects on smolt survival and adult returns of wild spring and summer chinook salmon. *In*: Passage and survival of juvenile chinook salmon migrating from the snake river basin. Proceedings of a technical workshop., University of Idaho, February 26-28, 1992. Pp 107-120.

This paper presents an overview of the NMFS smolt survival data set and reports the following. "Yearling chinook smolt survival rates from NMFS studies in 1970-80 are significantly related to flow and water velocity for aggregate wild/natural and hatchery fish. Smolt-to-adult returns were significantly correlated with water particle travel times for wild spring chinook from Marsh Creek, Idaho, as well as for Snake River aggregate spring and summer chinook and steelhead of wild/natural origin."

- 1994 Cada, G. F., M. D. Deacon, S. V. Mitz, and M. S. Bevelhimer. 1994. Review of information pertaining to the effect of water velocity on the survival of juvenile salmon and steelhead in the Columbia River basin. Prepared for the U.S. Department of Energy, contract No. DE-AC05-84OR21400.

The authors reviewed over 130 references and concluded that "Despite the problems with existing data sets, the general relationship of increasing flow in the Columbia River Basin still appears to be reasonable." Flow survival models tend to produce similar results at low flows, but diverge in their predicted survivals at higher flows, therefore the bounds for this relationship are presently undetermined.
- 1994 Seward, C. R. 1994. Assessment of the flow-survival relationship obtained by Sims and Ossander (1981) for Snake River spring/summer chinook salmon smolts, final report. Prepared for Bonneville Power Administration, project number 93-013. Portland OR. 78 p.

The author questions the validity and usefulness of the Sims and Ossander (1981) flow-survival relationship. "From my assessment of the methods and data used by Sims and Ossander (1981), I recommend that the flow-survival relationships *not* be generalized to existing populations and passage conditions. Fisheries managers, the public, and the fish themselves would be better served by data collected under present conditions using current technological and analytical techniques."
- 1994 Bevan, D., J. Harville, P. Bergman, T. Bjorn, J. Cruchfield, P. Klingemen, and J. Litchfield. 1994. Snake River Salmon Recovery Team: Final Recommendations to National Marine Fisheries Service.

The authors state that "there is a lack of information on which to base a scientific decision on the size and timing of the water budget that will maximize smolt survival."
- 1995 National Marine Fisheries Service Biological Opinion 1995

This document provides recommended flows and spills during juvenile salmonid migrations. Endorses transportation as primary mitigation tool: "...it is appropriate to continue to rely on transportation as a major means to mitigate the adverse impacts of the FCRPS."(p.111). "Spill and transportation operations are intended to be interim. Ideally these interconnected programs would be based on a rule curve that establishes the relationship between flow conditions, in-river survival, and the relative benefits of transportation." (p.112).
- 1995 National Marine Fisheries Service. 1995. Basis for minimum flow ranges for operation of the federal Columbia River power systems.

Cites several references that their is a significant relationship between flow and travel time, then states: "At least three mechanisms can be identified that link increased travel time resulting from lower flows to higher mortality". These are: 1) Increased exposure to predators, 2) Later arrival means higher temperatures which means increased predator

mortality, and 3) Later arrival means higher river temps which means decreased bypass efficiency.

1995 NMFS. 1995. Proposed recovery plan for Snake River salmon.

This document states that. "In general, there is a direct relationship between juvenile fish survival and flow..."it goes on to say "...it is difficult to determine the exact mechanism by which increased flow increases survival, and it is difficult to establish a particular level as being ideal or necessary. NMFS believes that changes in river management should be made, within the constraints of available water, to increase during the spring and summer salmon migration, restoring to some extent the natural hydrographic conditions under which listed salmon stocks evolved.

1997 Smith, S. G., W. D. Muir, E. E. Hockersmith, S. Achord, M. B. Eppard, T. E. Ruehle, J. G. Williams, and J. R. Skalski. Survival Estimates for the passage of salmonids through Snake River dams and reservoirs, 1996 annual report. Prepared for Bonneville Power Administration. Project 93-29. Portland, OR.

This study uses PIT tag data to reach the following conclusions. The relationship between flow exposure and travel time was relatively strong and consistent between years for both steelhead trout and yearling chinook salmon; higher flows were associated with shorter travel times. There was a decreasing trend in travel time throughout the season that could not be attributed to flow. Relationships between survival probabilities and flow volumes and other exposures were not consistent between years. There was no relationship between flow and survival within years.

Columbia-Snake River Irrigators Association Technical Memorandum

DATE: July 30, 2002

TO: CSRIA Board of Directors
Larry Cassidy, Chairman, Northwest Power Planning Council
Tom Karier, Ph.D., Eastern WA NPPC Member
And Interested Parties

FROM: Darryll Olsen, Ph.D., Resource Economist
CSRIA Board Representative

SUBJECT: Technical Analyses of Mainstem Water Withdrawals—
Salmon Survival Impacts on the Columbia River

UW Fish Survival Modeling—Background:

CSRIA technical representatives have been working with the Columbia Basin Research Center at University of Washington (UW) to review how new water withdrawal operations on the mainstem Columbia River would affect salmon survival. These analyses build upon previous work conducted with the UW.

As you may know, UW uses the CRISP model to evaluate the impacts of juvenile salmon migration through the Columbia-Snake River mainstem. The model, in various editions, has been used to estimate fish survival since the late 1980s—the original model version was known as FISH-PASS, and it was used by Argonne National Laboratory (ANL) researchers to model the impacts of fish survival at the Mid-Columbia River dams (I used the original model output data while working at ANL to estimate impacts affecting Rock Island Dam operations).

Several models have been developed during the past 10-15 years, including PAM (Northwest Power Planning Council), FLUSH (ODFW and tribes), Idaho Fish Manager Model (Pacific Northwest Project), and SYMPASS-II (NMFS).

The CRISP model has been periodically updated to incorporate new empirical research findings. In simple terms, the model is an "accounting model," estimating salmon/steelhead mortality/survival rates as the fish move through the Columbia River system.

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CSRIA Technical Analyses

1

To date, the CRISP model has produced survival rate estimates that calibrate very closely to actual, measured empirical data for mainstem fish survival (NMFS data). The model provides highly accurate estimates of fish survival, when compared to the data analyses developed by NMFS.

Using the model, it is possible to estimate the effects of incremental changes to the river system, including the effects of water withdrawals—new water rights—at various points along the Columbia River.

Modeling Water Withdrawals from the Columbia River:

The effects of water withdrawals from the Columbia River can be readily analyzed by CRISP, using parameters specified by CSRIA. These parameters are:

- Average (2000) and low (2001) water-year conditions (model actual flow data conditions).
- Proportional, incremental water withdrawals behind mainstem project pools (Mid-Columbia to John Day projects), reaching 350 cfs, 500 cfs, 750 cfs, and 1,000 cfs at the John Day Pool; thus emulating the effects of new water rights along the Columbia River system.
- Remove new water withdrawals for the period July-August, affecting the lowest water conditions—and with existing water withdrawals in place.
- Measure survival estimate changes from baseline, with and without incremental water withdrawal reductions up to 1,000 cfs.

Model Analyses Estimates:

The model analyses indicate that:

- New water withdrawals at 350 cfs would reduce fish survival within the mainstem Columbia River by substantially less than 1%, under low water-year conditions.
- New water withdrawals at 1,000 cfs would reduce fish survival within the mainstem Columbia River by substantially less than 1%, under low water-year conditions.
- In effect, there exists no empirical impact to fish survival with an additional 350 to 1,000 cfs flow reduction in the mainstem Columbia River, even under low water-year conditions.

- Extrapolations from the model analyses suggest that several thousand cfs would have to be withdrawn from the river system in order to create a survival rate decrease of 1%—a level that would still be beyond empirical measurement (it could only be measured through the mathematical relationships incorporated within the model).
- By comparison, the Quad-Cities' new water right amounts to 15 cfs (estimated 8-year's incremental use). The effect on fish survival is not measurable on an empirical basis; virtually no impacts to fish survival would result from the new water right withdrawal.

Policy Implications for WA State (New Water Rights) and NPPC Decisions :

There are several key policy implications related to the above analyses:

Water Rights:

- The WA State Dept. of Ecology's use of the "no net loss" water policy as a justification not to issue new water rights, in order to "protect" migrating fish runs, is totally unfounded. Neither the UW modeling analyses, nor the empirical data or observations, support WADOE's policy action.
- The WA State Dept. of Ecology intends to issue a new water right to the Quad-Cities, purchasing water from other water rights to "mitigate" the effects of the new 15 cfs water withdrawal. Based on the UW analyses, the WADOE's use of state funds for such a "mitigation" measure represents an extraordinary waste of public money.
- The WADOE's failure to incorporate the past and ongoing work of the UW researchers—or to even address such analyses within the agency's recent record of examinations (ROEs) for new water rights—constitutes a clear failure to adhere to an objective, technical and scientific process. (As you will recall, Mr. Keith Phillips, WADOE manager, earlier stated to the CSRIA Board that the agency had deliberately excluded review of technical information counter to the flow targets from being used by WADOE in the ROEs).

Flow Targets:

- The UW analyses further suggest that the benefits of flow augmentation on the mainstem Columbia River are highly marginal at best, even under low water-year conditions.
- The mainstem flow targets are highly arbitrary in nature, established by NMFS policy decree rather than derived from well-developed scientific observations.

This summary file created: CRSP/LB models post migration new dependent variables for Snake River and Lower Columbia routes.
 Runs performed @ Columbia Basin Research by Jim Anderson and Chris Van Halbeek (jim@cbwr.usda.gov, chv@cbwr.usda.gov)

Flow Year (1)	Total withdrawal (KCFY)	Irrigation withdrawal per reservoir (KCFY) (2)	Stock	Release Site	Release start day	In-River Survival Fraction (3)	YWR Alt IRR split Mortality (4)	Total System survival fraction	Change in Total Survival from baseline (5 withdrawal)	Fraction of Release Transposed
2000	0.00	0.000	Southwest	Okanogan Confluence	110	0.54288	NA	0.54288	0.00000	0
2000	0.35	0.008	Southwest	Okanogan Confluence	110	0.54288	NA	0.54288	0.00000	0
2000	0.80	0.025	Southwest	Okanogan Confluence	110	0.54288	NA	0.54288	0.00000	0
2000	0.75	0.135	Southwest	Okanogan Confluence	110	0.54288	NA	0.54288	0.00000	0
2000	1.00	0.187	Southwest	Okanogan Confluence	110	0.54288	NA	0.54288	0.00000	0
2000	0.80	0.000	Southwest	Snake River Trap	81	0.53087	NA	0.70427	0.00000	0.07647
2000	0.35	0.008	Southwest	Snake River Trap	81	0.53087	NA	0.70427	0.00000	0.07647
2000	0.80	0.083	Southwest	Snake River Trap	81	0.53087	NA	0.70427	0.00000	0.07647
2000	0.75	0.135	Southwest	Snake River Trap	81	0.53088	NA	0.70427	0.00000	0.07647
2000	1.00	0.187	Southwest	Snake River Trap	81	0.53088	NA	0.70427	0.00000	0.07647
2000	0.00	0.000	Subyearling Chinook	Okanogan Confluence	188	0.64885	NA	0.64885	-0.00012	0.08019
2000	0.35	0.008	Subyearling Chinook	Okanogan Confluence	188	0.64885	NA	0.64885	-0.00012	0.08019
2000	0.80	0.083	Subyearling Chinook	Okanogan Confluence	188	0.64885	NA	0.64885	-0.00012	0.08019
2000	0.75	0.135	Subyearling Chinook	Okanogan Confluence	188	0.64847	NA	0.64847	-0.00028	0.07791
2000	1.00	0.187	Subyearling Chinook	Okanogan Confluence	188	0.64847	NA	0.64847	-0.00028	0.07791
2000	0.00	0.000	Subyearling Chinook	Snake River Trap	137	0.12732	0.12882	0.43014	-0.00004	0.48184
2000	0.35	0.008	Subyearling Chinook	Snake River Trap	137	0.12732	0.12882	0.43014	-0.00004	0.48184
2000	0.80	0.083	Subyearling Chinook	Snake River Trap	137	0.12732	0.12882	0.43014	-0.00004	0.48184
2000	0.75	0.135	Subyearling Chinook	Snake River Trap	137	0.12731	0.12882	0.43013	-0.00014	0.48184
2000	1.00	0.187	Subyearling Chinook	Snake River Trap	137	0.12732	0.12882	0.43	-0.00014	0.48184
2000	0.00	0.000	Yearling Chinook	Okanogan Confluence	106	0.57728	NA	0.57728	0.00000	0
2000	0.35	0.008	Yearling Chinook	Okanogan Confluence	106	0.57728	NA	0.57728	0.00000	0
2000	0.80	0.083	Yearling Chinook	Okanogan Confluence	106	0.57728	NA	0.57728	0.00000	0
2000	0.75	0.135	Yearling Chinook	Okanogan Confluence	106	0.57728	NA	0.57728	0.00000	0
2000	1.00	0.187	Yearling Chinook	Okanogan Confluence	106	0.57728	NA	0.57728	0.00000	0
2000	0.00	0.000	Yearling Chinook	Snake River Trap	75	0.49882	NA	0.73888	0.00000	0.87727
2000	0.35	0.008	Yearling Chinook	Snake River Trap	75	0.49882	NA	0.73888	0.00000	0.87727
2000	0.80	0.083	Yearling Chinook	Snake River Trap	75	0.49882	NA	0.73888	0.00000	0.87727
2000	0.75	0.135	Yearling Chinook	Snake River Trap	75	0.49882	NA	0.73888	0.00000	0.87727
2000	1.00	0.187	Yearling Chinook	Snake River Trap	75	0.49882	NA	0.73888	0.00000	0.87727
2001	0.00	0.000	Southwest	Okanogan Confluence	110	0.30082	NA	0.30082	0.00000	0.30082
2001	0.35	0.008	Southwest	Okanogan Confluence	110	0.30082	NA	0.30082	0.00000	0.30082
2001	0.80	0.083	Southwest	Okanogan Confluence	110	0.30082	NA	0.30082	0.00000	0.30082
2001	0.75	0.135	Southwest	Okanogan Confluence	110	0.30082	NA	0.30082	0.00000	0.30082
2001	1.00	0.187	Southwest	Okanogan Confluence	110	0.30082	NA	0.30082	0.00000	0.30082
2001	0.00	0.000	Southwest	Snake River Trap	81	0.08641	NA	0.72615	0.00000	0.72615
2001	0.35	0.008	Southwest	Snake River Trap	81	0.08641	NA	0.72615	0.00000	0.72615
2001	0.80	0.083	Southwest	Snake River Trap	81	0.086	NA	0.72615	0.00000	0.72615
2001	0.75	0.135	Southwest	Snake River Trap	81	0.08689	NA	0.72615	0.00000	0.72615
2001	1.00	0.187	Southwest	Snake River Trap	81	0.08689	NA	0.72615	0.00000	0.72615
2001	0.00	0.000	Subyearling Chinook	Okanogan Confluence	188	0.03011	NA	0.03011	-0.00011	0.03011
2001	0.35	0.008	Subyearling Chinook	Okanogan Confluence	188	0.03011	NA	0.03011	-0.00011	0.03011
2001	0.75	0.135	Subyearling Chinook	Okanogan Confluence	188	0.03011	NA	0.03011	-0.00011	0.03011
2001	1.00	0.187	Subyearling Chinook	Okanogan Confluence	188	0.03011	NA	0.03011	-0.00011	0.03011
2001	0.00	0.000	Subyearling Chinook	Snake River Trap	137	0.11685	0.12844	0.40008	0.00000	0.51828
2001	0.35	0.008	Subyearling Chinook	Snake River Trap	137	0.11682	0.12841	0.40008	0.00000	0.51828
2001	0.80	0.083	Subyearling Chinook	Snake River Trap	137	0.11682	0.12841	0.40008	0.00000	0.51828
2001	0.75	0.135	Subyearling Chinook	Snake River Trap	137	0.11682	0.12841	0.40008	0.00000	0.51828
2001	1.00	0.187	Subyearling Chinook	Snake River Trap	137	0.11682	0.12841	0.40008	0.00000	0.51828
2001	0.00	0.000	Yearling Chinook	Okanogan Confluence	106	0.22087	NA	0.22087	0.00000	0.22087
2001	0.35	0.008	Yearling Chinook	Okanogan Confluence	106	0.22087	NA	0.22087	0.00000	0.22087
2001	0.80	0.083	Yearling Chinook	Okanogan Confluence	106	0.22087	NA	0.22087	0.00000	0.22087
2001	0.75	0.135	Yearling Chinook	Okanogan Confluence	106	0.22087	NA	0.22087	0.00000	0.22087
2001	1.00	0.187	Yearling Chinook	Okanogan Confluence	106	0.22087	NA	0.22087	0.00000	0.22087
2001	0.00	0.000	Yearling Chinook	Snake River Trap	75	0.38079	NA	0.38079	0.00000	0.38079
2001	0.35	0.008	Yearling Chinook	Snake River Trap	75	0.38079	NA	0.38079	0.00000	0.38079
2001	0.80	0.083	Yearling Chinook	Snake River Trap	75	0.38079	NA	0.38079	0.00000	0.38079
2001	0.75	0.135	Yearling Chinook	Snake River Trap	75	0.38079	NA	0.38079	0.00000	0.38079
2001	1.00	0.187	Yearling Chinook	Snake River Trap	75	0.38079	NA	0.38079	0.00000	0.38079

NOTES

(1) CRSP/LB Results for Normal Flow (2000) and Low Flow (2001) Irrigation scenarios

(2) Survival from release through the end of the Bonneville Tailrace.

The Alternative In-River Survival with the Alternative IRR split mortality applies to Snake River subyearling chinook. They are assigned a split mortality of 11.5% which is equal to 80% of the output to account for the latest alternative day and night mortality estimates. Southwest and yearling chinook have IRR split mortality of 2%.

(4) Equal Irrigation withdrawals in KCFY from each of the following reservoirs: WEL, RSE, WAMUPRO, MCA, JDA

Response to the ISAB Review of Flow Augmentation: Update and Clarification Feb 10, 2003

By James Anderson
Columbia Basin Research
February 25 2003.

Introduction

I am responding to your request for comments on the ISAB review of flow augmentation update and clarification. I was asked by the ISAB to provide information to them on my research. I provided four reports:

1. The Flow Survival Relationship and Flow Augmentation Policy in the Columbia River Basin
2. Supplement to The Flow Survival Relationship and Flow Augmentation Policy in the Columbia River Basin
3. A collision theory based predator-prey model and application to juvenile salmonids in the Snake River Basin
4. An analysis of smolt survival with implications to flow management

These analyses are germane to the three questions the Council put forward to the ISAB on flow augmentation and smolt survival. In particular, documents 3 and 4 are relevant to the questions and the ISAB analysis. None of this work was noted by the ISAB.

My reply to the ISAB review is based on my work. I first present a brief overview of how I am evaluating the flow survival issues. Second, I consider the ISAB's responses to the Council questions in light of my analysis. My conclusions on the impacts of flow and survival and my responses to the Councils differ significantly from the ISAB's. I have intended my response to be respectful but candid with the belief that this is the best way to assist the Council in its difficult task.

The XT model

My analysis on the impacts of flow on smolt survival begins with a new theory I call the XT model because it describes survival in terms of both migration distance, X, and migration time T. The XT model represents a new approach to understanding smolt survival and predator prey interactions in general. It synthesizes in a single framework the CRISP, SIMPAS, and the ISAB's new fluctuating flow theories. Furthermore, the model provides an ecologically-based foundation that includes the effects of temperature and turbidity on smolt survival.

The number of salmon that predators eat depends largely upon three things: 1) the frequency of encounters with predators as the smolts swim downstream (primarily a function of distance traveled), 2) whether the predators can see them (primarily a function

of the turbidity of the water), and 3) how hungry the predators are (metabolism, largely a function of temperature).

The frequency of encounters depends on the balance of the smolts' directed downstream migration and their random movements relative to the predators. In this approach, the importance of smolt travel time depends on the fish behaviors. If smolts move directly down river in a steady flow and the predators sit-and-wait for the smolts to pass, then the smolts pass a gauntlet of predators and their survival is independent of the amount of time it takes to migrate, only the number of predators they encounter, which depends on migration distance. If smolts exhibit random movements in addition to their directed movements, then multiple encounters between predators and the smolts may occur, especially if the predators also move about searching for smolts. In this case migration time as well as distance traveled determine the amount of mortality. The balance of migration time and distance in determining smolt survival is characterized by a single variable, the random encounter velocity between predators and prey. This in turn can be estimated from survival, travel time, and travel distance.

Turbidity plays a role since the predators must see the smolts in order to capture them. The significance of visibility is characterized by a shape parameter, which can be estimated from survival and turbidity. Furthermore, the shape parameter is determined by the relationship between visibility and the reaction field of a predator and can be estimated independently from individual predator prey studies and ecological theory.

Temperature in the model affects the hunger of predators and is characterized by a factor that can be estimated from temperature and survival data and independently by the response of predators to temperature.

Thus, the XT model relates smolt survival to their travel time, their travel distance, water temperature and water turbidity. Put into a regression form, the values of the regression coefficients describe the contribution of each factor to smolt mortality.

My co-author and I are submitting a paper describing the basic XT model to the *American Naturalists*.

I applied the model to several thousand days of survival studies over the Snake and Columbia Rivers for spring, summer and fall chinook, and steelhead. This work was submitted to the NRC panel studying the impacts of flow on smolt survival in a study requested by the State of Washington. This document will be submitted to a journal soon. Enclosed is a draft manuscript. However, like the ISAB's hypothesis, mine is a work in progress.

The Council's Questions

Council Question 1. What is the evidence and to what extent will flow augmentation from storage reservoirs result in the same environmental attributes as higher flow under

natural conditions? In other words, how sound is the scientific approach of research that looks at correlations of fish movement and survival in relation to natural variations of environmental conditions such as flow, temperature, and turbidity, and then extrapolates to infer that man-made additions of flow will result in the same environmental attributes? Are there studies that more directly measure the effects of flow augmentation? If so what are the results of those studies?

ISAB Answer to Question 1:

The ISAB was unable to answer the question of whether the flow increments produced by flow augmentation will or will not induce conditions that enhance smolt survival. The ISAB could not answer this question because they viewed flow as the only variable affecting fish survival. The ISAB's approach cannot resolve the flow survival issue. Fish survival is not affected by a single variable and linear regressions of survival against a flow as constructed by NMFS and accepted by the ISAB are wholly inadequate to address the problem.

What the XT model reveals:

From my analysis of the data with the XT model, I conclude that temperature, migration distance and the amount of spill are the largest factors determining smolt survival. Smolt travel time is of minor importance. My work indicates that flow, through its effect on smolt travel time, is a minor variable. Furthermore, the effects of flow augmentation on smolt survival depend on the resulting impact of the augmentation on temperature and, secondarily, on turbidity. Therefore, I conclude that man-made additions of flow will not result in the same environmental attributes and effects on smolt survival as natural variations.

My paper "An analysis of smolt survival with implications to flow management" addresses these factors. To illustrate the basis of my conclusion, consider the relationship between flow and survival between Lower Granite and McNary Dam in 2001. In this data, survival continually decreases over the season as the water warms (Figure 1) but the flow follows a different pattern, increasing up to the spring maximum flow and then decreasing into the summer resulting in a > shape (Figure 2). This clearly demonstrates that survival is not monotonically related to flow as has been assumed in other studies. That is, the other studies all assume that survival increases with flow. The data shows survival can increase or decrease with flow. Note also that the figures show both the data (○) and the model (●) predictions of survivals of fish grouped according to their passage date at Lower Granite Dam. The model fits the flow survival and travel time survival relationships (Figure 3) but contains neither fish travel time nor flow. Furthermore, in both examples, the data and modeled relationships are highly nonlinear; that is survival both increases and decreases with travel time and flow. These facts alone should cast doubt on any analysis based exclusively on flow, whether flow is expressed as an average index as was done by NMFS, in terms of water particle travel time as was done by the Fish Passage Center, or in terms of fluctuating flows as was done by the ISAB.

What the XT analysis says about flow augmentation

The effect of flow augmentation should be viewed in terms of its impacts on temperature, turbidity, and fish velocity. Thus, addressing how flow affects fish requires first addressing how flow affects temperature, turbidity, and velocity, and second, addressing how these variables affect smolt survival.

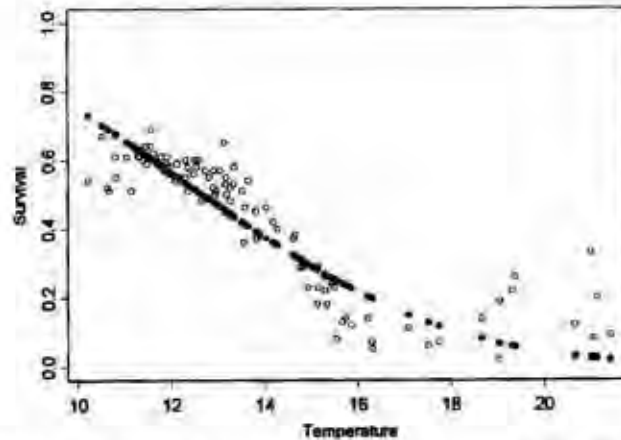


Figure 1. Modeled and observed chinook survival vs. temperature (°C) for migration between LGR and MCN in 2001. Survival estimated with PIT tags designated (○); survival estimated with the X-model designated (●).

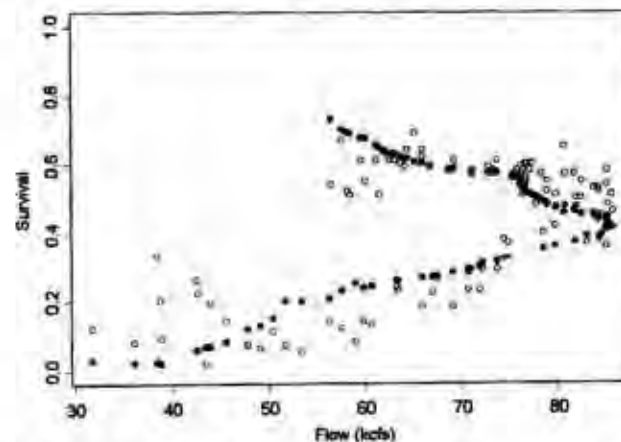


Figure 2. Modeled and observed chinook survival vs. flow for migration between LGR and MCN in 2001. Survival estimated with PIT tags designated (○); survival estimated with the X-model designated (●).

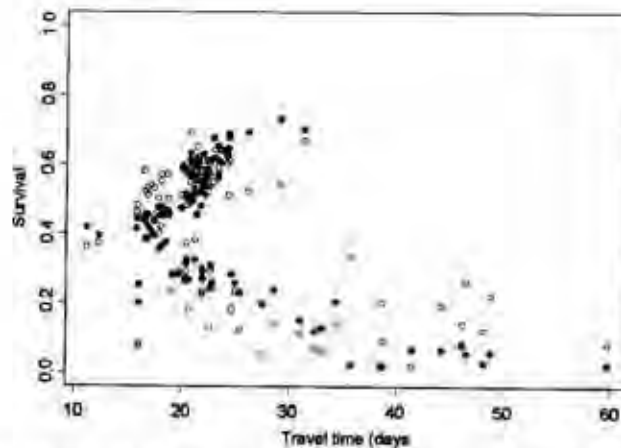


Figure 3. Modeled and observed chinook survival vs. travel time for migration between LGR and MCN in 2001. Survival estimated with PIT tags designated (○), survival estimated with the X-model designated (●).

Council Question 2. To what extent will incremental flow augmentation within a year have the same effect on survival as the year-to-year changes in flow that are also accompanied by year to year changes in climate and ocean conditions?

A. Relevant to the draft mainstem amendments, to what extent will changes in reservoir release strategies that could result in decreases in spring and summer flows of approximately 10% or less have a statistically significant effect on juvenile salmon and steelhead survival?

B. A linked question is what scientific evidence exists that decreased travel time as a result of flow augmentation will result in increased juvenile survival?

ISAB Answer to Question 2:

The ISAB concluded that incremental flow augmentation is not likely to have dramatic beneficial effects on in-river smolt survival. They also conclude that effects of flow augmentation on survival in the ocean and estuary is unknown.

My response:

In my analysis, I determined that both the year-to-year survival patterns and the within year survival patterns could be explained principally by temperature only. From this explanation, I conclude that we need to consider the impact of flow augmentation on river and ocean temperatures relative to the impacts of year-to-year variations in climate on river and ocean temperatures in order to address the Council's question. Flow augmentation from Dworshak, which is colder than the water body it enters, will improve survival slightly but flow augmentation from the Hells Canyon complex, which is warmer than the Snake River (Anderson 2001) will decrease survival. However, the

amount of temperature change in both cases is small and I expect that it will have unmeasurable impacts on fish survival through the river. However, this analysis has not been done. Furthermore, since the flow augmentation is small compared to the total river flow into the estuary and ocean, the impact of flow augmentation is insignificant irrespective of the basis of any relationship between flow and survival one assumes (Anderson, Hinrichsen and Van Holmes 2000).

ISAB Answer to Question 2A:

The ISAB believes a 10% decrease in augmentation would not affect survival for flows above 100 kcfs but could have an impact below that level. They based their conclusion on a breakpoint in the flow survival plot presented by NMFS on December 11, 2002 (Figure 4).

My response:

By plotting essentially the same data, grouped daily instead of weekly as was done by NMFS, I obtained a similar pattern (Figure 5). The ISAB interpreted the NMFS plot as evidence that survival decreases as a result of the lower flow below a flow of 100 kcfs. Note that the pattern was entirely generated by the low flow and survival in 2001. If the relationship were driven by flow then the ISAB's conclusion of a benefit of flow augmentation below 100 kcfs is reasonable. However, if the survival decline was not a result of flow but of another variable that exhibits a seasonal pattern with flow then we may not expect the same benefit of flow augmentation that is exhibited in the seasonal pattern. In fact, this is what I have found.

My analysis included water temperature, turbidity and fish travel time, which is linearly correlated with flow and therefore is a surrogate for flow for spring chinook. Using these variables in the XT model the regression determining the significance of each variable revealed that temperature was the only factor needed to fit the survival pattern within years and between years. Figure 1 illustrates the temperature survival pattern for 2001 and Figure 6 illustrates the pattern over the years 1995 through 2002. The patterns were the same across all years. However, even though the XT model contains only temperature it actually fits the flow vs. survival data better than the NMFS flow vs. survival curve. Compare the fits of the 2001 data with the NMFS flow line (Figure 4) and the temperature based prediction of flow vs. survival from the XT model (Figure 5). The NMFS prediction pass through the main scatter of points but for 2001, which is within the oval in Figure 4, the flow line is unable to track the > shaped pattern. In contrast, the XT temperature-based model fits both the general pattern and the within-season 2001 pattern.

Clearly, if temperature, not flow, is the operative variable, then the effect of flow augmentation depends on the temperature of the augmentation water compared to the temperature of the water body. Augmentation from Dworshak, which is cooler than the Snake River, would have a small benefit on survival while augmentation from Hells Canyon, which is warmer than the Snake River, would decrease survival.

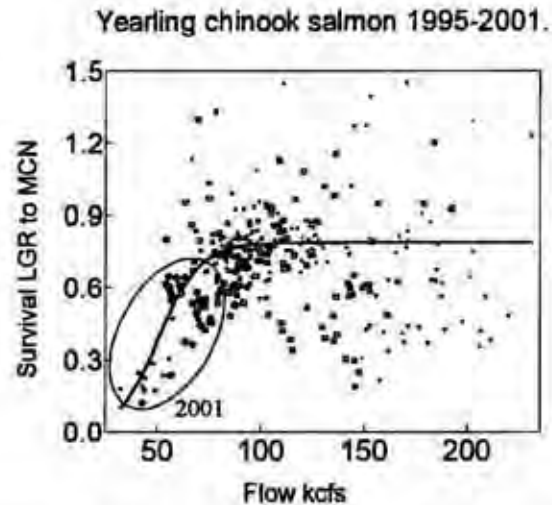


Figure 4. Relationship of flow and survival between LGR and MCN dams presented by NMFS December 11, 2002. The oval depicts the data from 2001.

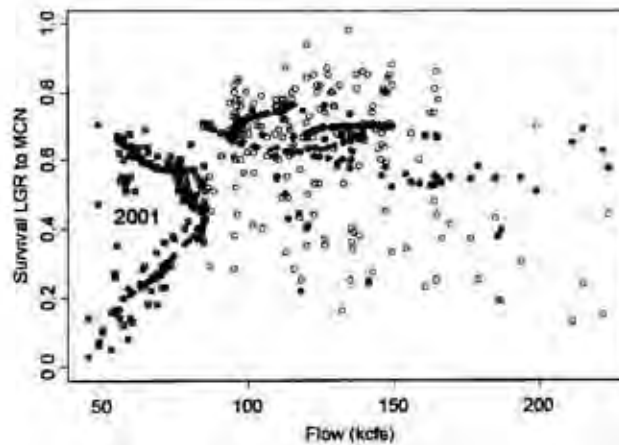


Figure 5. Modeled and observed chinook survival vs. flow for migration between LGR and MCN in over the years 1995 through 2002. Survival estimated with PIT tags designated ($\circ$) survival estimated with the X-model designated ($\bullet$). The 2001 data is designated by an x in the symbol $\circ$.

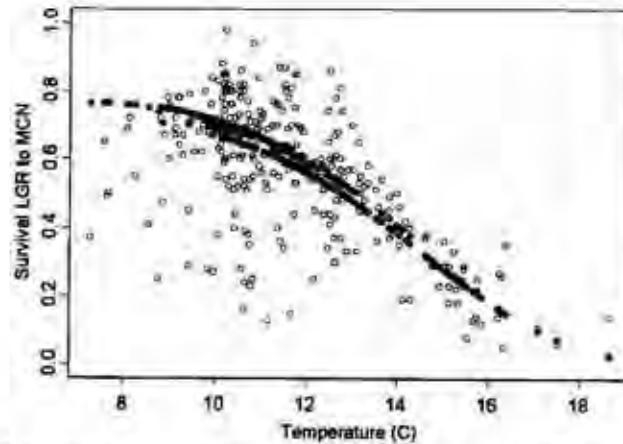


Figure 6. Modeled and observed chinook survival vs. temperature (°C) for migration between LGR and MCN between 1995 and 2002. Survival estimated with PIT tags designated (○); survival estimated with the X-model designated (●).

However, the breakpoint inferred by the ISAB must exist. When the flow goes to zero, the survival must also go to zero, and because flow and survival are unrelated over most of the observed range, we expect some breakpoint. The XT model establishes an ecological foundation for flow survival breakpoints and it is thus possible to estimate the breakpoint when temperatures are essentially uniform from year-to-year over a range of flows. Such conditions exist for migration of Dworshak hatchery fish to Lower Granite Dam. Data collected between a 1990 and 2001 (Figure 7) clearly show that survival is independent of flow over a range 38 to 133 kcfs. Fitting the XT data to this model indicates that the flow survival break point is on the order of 25 kcfs and is very sharp. Here again, the model and data both agree that flow is not a factor in determining smolt survival.

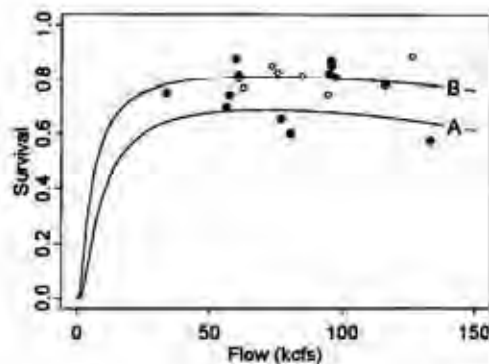


Figure 7. Relationship of flow to smolt survival from Dworshak Hatchery to Lower Granite Dam. Curve A uses travel distance $X = 116$ km and curve B uses $X = 64$ km. Open points are survivals for release dates greater than Julian Day 100. Solid points are survivals for release dates Julian Day 100 or less.

My analysis supports the ISAB statement that a 10% decrease in spring and summer flows will not have a deleterious effect on reach survival. In fact, my analysis allows a stronger statement. Because my analysis indicates temperature, not flow, controls survival over observed ranges of flow and the breakpoint is the below 33 kcfs a flow augmentation reduction should not impact reach survival unless it also impacts river temperature. In this case, the reduction could increase or decrease survival very slightly depending on the temperature differential of the river water and the augmentation water. However, I do not see changes in flow augmentation consigning "salmon to death by a thousand cuts" as suggested by the ISAB.

ISAB Answer to Question 2B:

The ISAB believes that the more time fish spend in a reach, the higher their mortality. They further believe that a more critical question involves the instantaneous mortality, which is the percent mortality per day. From their note on the mathematics of reach survival and flow, they conclude that the mortality rate may increase as a result of low flow or other factors such as temperature and turbidity.

My response:

Although I applaud the ISAB in considering the problem beyond simply regressions of flow against survival I suggest their analysis is insufficient. The manuscript "A prey survival model based on path length theory with application to juvenile salmonids in the Snake River Basin" presents a rigorous mathematical foundation for studying reach survival.

In contrast to the ISAB, I conclude from my work that the amount of time it takes smolts to migrate through the river does not have a significant impact on their survival through the river. The only clear exception I have found so far is for the survival of Snake River fall chinook to Lower Granite Dam. For these fish, survival depends on the velocity, travel time, water temperature, and turbidity. For the other stocks investigated to date, including spring chinook migrating through the hydrosystem, survival depends on distance traveled, which characterizes the number of predators encountered, temperature that affects the predator activity, and spill that affects the survival in dam passage.

Both NMFS and the ISAB have expressed concern for the effect of fish arrival time on their survival in the estuary. Whether or not this is a problem, it can be summarily disregarded in the context of flow augmentation. Simply stated, flow augmentation changes the water velocity too little to affect fish arrival time to the estuary. Analysis with the CRISP model indicates flow augmentation can only change arrival time by a few hours over a migration of several weeks. Furthermore, the impacts of the flow

augmentation on the estuary and freshwater plume dynamics can similarly be discounted because flow augmentation alters the total flow very little.

Council Question 3. Are the statistical methods used in recent flow-survival analyses rigorous and technically sound? Did the analyses properly incorporate and treat 2001 low-water-year data?

ISAB Answer to Question 3:

The ISAB considered the statistical methods sound but questioned whether they were appropriate, citing the Fish Passage Center flow survival review.

My response:

I disagree on the adequacy of the methods used to date. The flow survival analyses conducted by NMFS, FPC and the ISAB are all inadequate. In particular, with minor variations, they all consider only flow: NMFS used a flow index, the Fish Passage Center used water particle travel time, and the ISAB used flow fluctuations. All are incomplete. The NFMS analysis is correlative without causation. The FPC analysis is also correlative, and as my analysis and the ISAB's both noted, the flow survival relationship in the FPC analysis is driven by 2001 data.

Smolt migratory survival depends a number of factors so to try and understanding the impacts of flow on survival by considering only flow is simply wrong. However, the region has focused on flow and the brokenstick flow survival hypothesis for two decades. I applaud the Council for its efforts to review the problem and move forward with new information and ideas. I applaud ISAB for its efforts to think beyond linear regressions and encourage them to become further aware and involved in the work being conducted in the region.

Comments on the ISAB alternative hypothesis explaining data.

In seeking an explanation for the brokenstick in the flow survival pattern, the ISAB hypothesize that the fluctuating flows due to variable dam operations may be responsible. Variations in dam operations create seiches in the reservoirs and alter the forebay hydrodynamics with the effect being most pronounced under low flow conditions. The ISAB hypothesize these changes may disorient fish causing them to wandering through the reservoir. While the ISAB has not quantitatively linked flow variations to fish survival there are several analyses through which this can be done.

The XT model provides one approach. The model partitions smolt velocity into fluctuating and average parts and the relative magnitudes of the two determine the contributions of migration distance and time to smolt survival. Through this model we can, for example, evaluate the importance of seiches in producing a brokenstick flow survival relationship. Taking the elevation data presented by the ISAB the seiche wave velocity is about 30 mph, such that the Lower Monumental Reservoir elevation exhibits an oscillation on the order of an hour. Assuming an average reservoir depth of 100 ft,

and a seiche amplitude of 1 foot the root-mean squared horizontal velocity is $u = 4$ cm/s. In comparison the average migration velocity of the fish is about $U = 23$ cm/s. If the seiche is the only contributor to random movement in the smolt migration, then the survival equation would be expressed

$$(1) \quad S = \exp\left(-\frac{l}{\delta} \sqrt{23^2 + 4^2}\right)$$

where δ is the length scale of the ecological neighborhood in which the predator interacts with the prey. The equation factors in the contribution of the average downstream migration velocity, 23 cm/s, and the seiche induced random velocity 4.36 cm/s. With the seiche, the characteristic velocity is $\sqrt{23^2 + 4.36^2} = 23.41$ cm/s, which increases the rate by 1.7% when the average migration velocity is 23 cm/s. Thus, at typical migration velocities a seiche would have no significant effect of the rate or mortality. However, at some point the average migration velocity becomes sufficiently low such that the seiche does become significant. This is illustrated in the Figure 8 below where the average velocity is in terms of multiples of the seiche velocity, which is normalized to 1. The figure demonstrates the breakpoint in the flow survival curve occurs when the average migration velocity is equal to 1.8 times the random velocity. Thus, the XT model predicts that for a seiche with a 4.3 cm/s rms velocity to produce the flow survival breakpoint the average fish migration velocity is 7 cm/s. If fish velocity decreases linearly with flow and the average flow is 100 kcfs then the flow induced breakpoint is on the order of 30 kcfs. From this cursory example I conclude that a 1 foot seiche is not responsible for the breakpoint in the flow survival plots. More important though, the example illustrates that theory is available to evaluate the ISAB's fluctuating flow hypothesis.

Other work in progress will contribute to evaluating the effects of flow on survival. In particular, Andy Goodwin and John Nestler of the Army Corps have made significant progress in modeling the response of salmon smolts to river flows and the hydraulic conditions at the forebay of dams. The work, which is part of Goodwin Ph.D dissertation from Cornell University, has combined a computational fluid dynamics model with a behavior model to predict the detailed movement of fish in the forebay of Lower Granite Dam. The model was calibrated with detailed movements of radio and hydroacoustic tagged fish. Goodwin reports "I've been able to match the percentages with which juvenile steelhead use each of the passage routes through the dam ($\pm 10\%$), which Gary Johnson said was within the error of the data. I can capture behaviors in the forebay such as shadowing of the BGS, tracing of the trash boom, (more or less) the proper holding & milling locations, and (within an order-of-magnitude) the residence time (A. Goodwin Personal communication)." This work and the XT model are important because they illustrate that other ongoing research is advancing the quantitative approaches hypotheses proposed in the ISAB review.

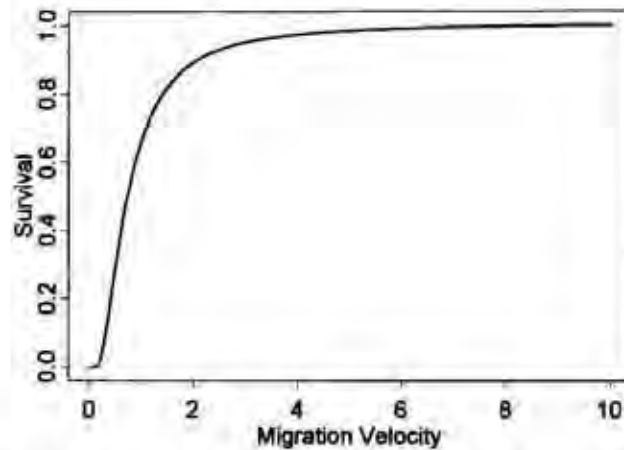


Figure 8. The XT model survival vs. average migration velocity expressed as multiples of the smolts random component of their migration velocity

Summary

NMFS and FPC used linear and multiple-linear regression techniques to analyze factors affecting flow. These approaches have no ecological basis and are incapable of explaining flow breakpoints or the differences in survival patterns within a year and between years. NMFS concluded that within-year patterns are not statistically significant and have generally ignored them. However my analysis clearly shows there are within-year patterns, which must be explained along with the between-year patterns in any coherent robust analysis. The NMFS and FPC analyses are unsatisfactory because they are devoid of ecological foundations. The ISAB moved closer to an ecological basis by approaching the problem with their fluctuating flow hypothesis. However, their work to date is speculative, qualitative, and is not based on solid first principles of ecology. NMFS, FPC, and the ISAB are all too flow centric in their approach. In fact, for over two decades the region has attempted to explain the effects of flow on fish survival without consideration of other environmental factors. This approach has yielded little to an understanding of smolt survival.

Whereas the flow centric models assume flow is the operative variable controlling survival, the XT model, offers an ecologically-based approach to study the effect of environmental properties on smolt survival and allows the data to indicate the significance of each variable. The model addresses the fluctuating flow hypothesis proposed by the ISAB, explains and quantifies flow-induced breakpoints, and fits both the between- and within-year patterns of survival. Additionally, because the model coefficients have ecological meaning, coefficient values derived by fitting survival data can be tested against values determined independently. For example, the model's coefficient predicting how predator activity increases with temperature compares favorably with laboratory estimates of predator feeding activity changes with temperature.

The conclusions that I reach from with the XT model disagree with the findings of the ISAB.

- I find the break in the flow survival curve is not due to flow, but to differences in temperature in 2001 compared to other years.
- My initial analysis indicates that seiches of the intensity identified by the ISAB are not response for the breakpoint at 100 kcfs. I estimate a flow induced flow survival breakpoint would occur at about 25 to 30 kcfs.
- My analysis does not support the ISAB hypothesis that regulating river flows will significantly affect fish survival unless river flow drops below 30 kcfs.
- My analysis does not support the ISAB belief that changes in estuary conditions and smolt arrival time to the estuary resulting from flow augmentation are significant. The contribution of flow augmentation to estuary processes is simply too small to be significant.
- I disagree with the ISAB's statement that the within year survival data does not show a pattern. There are patterns, especially in 2001, and any model used to evaluate the flow augmentation program must be able to explain and fit both the within year and the between year patterns.

I do reach several conclusions that agree with the ISAB's review:

- The prevailing flow-augmentation paradigm is no longer supportable by the data.
- Valid approaches must be based on ecological mechanisms for explaining smolt survival.
- Interpretation of flow requires an understanding of the relation between reach survival, instantaneous mortality, migration speed, and flow. I add to this list the need to understand the contributions of environmental factors including temperature and turbidity. Also, the understanding must have a theoretical basis that is mathematically rigorous and based on first principles of ecology.

Final thoughts

The XT model and resulting analysis are new and important to the understanding the impacts of flow on survival. However, the ISAB's review contains no reference to the work, which admittedly is in progress, but was available to the ISAB. Furthermore, I realize that the work must be completed and reviewed before it factored into the Council's decision. However, even though it is work in progress, it illustrates that the ISAB review was significantly incomplete and conclusions reach by the ISAB may be open to challenge on a solid scientific foundation.

**Supplement to
“The Flow Survival Relationship and Flow Augmentation Policy in the
Columbia River Basin”
Analysis of New Results**

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November 11, 2002

Analysis of flow and survival in the year 2001

Smolt data from 2001, an extremely low flow year, overwhelmingly shows that the effect of incremental within-year changes in flow on juvenile fish survival are not significant. Even using between-year flow data, which is not appropriate to evaluate the effects of a within-year change in flow, a one kcfs withdrawal changes fish travel time by less than 3 hours over a two to three week migration and changes survival by no more than a few hundredths of a percent on a base survival of 20% to 50%.

Because 2001 had some of the lowest flows on record, it is valuable to compare it to other years to evaluate the effects of very low flow on fish survival and travel time. The flow in 2001 was about half a normal year. Using McNary Dam as a reference point, the average flow during wild spring chinook passage was 135 kcfs. The survival between Lower Granite and Bonneville dams was 26.7% for spring chinook smolts and 3.8% for

steelhead smolts. In comparison, average 2002 flow experienced by these stocks was about 238 kcfs and their survivals were 50.4% and 26.7% respectively. The spring chinook travel time between Lower Granite Dam and Bonneville Dam in 2001 was corresponding slow at 34 days, while in 2002 the fish migration took 18.7 days, which is typical of years with average flows. The 2001 data is especially valuable because it provides a low flow data point, which clarifies the between-year flow-survival relationship. Including other years in a linear regression shows that each one kcfs change in flow increases the travel time between Lower Granite Dam and Bonneville Dam by less than 3 hours. This travel time change should also occur for a one kcfs withdrawal. Taking a linear regression of flow and survival between years, we find a one kcfs reduction in flow between two years is associated with changes in survival of about 0.14% for spring chinook and 0.2% for steelhead. Thus, if the flow index is 200 kcfs in one year and 199 kcfs in the next year, the spring chinook survival would change from 38.98 % to 38.84% and the steelhead survival would change from 17.79% to 17.57%.

However, these changes in survival between years, although small, also correlated with differences in environmental conditions including temperature, turbidity and fish condition. For example, in 2001 the average temperature during wild spring chinook passage was 14.7 °C while in 2002 the average temperature during passage was 11.8 °C. Because water withdrawals affect flow without measurably affecting temperature, turbidity and fish condition, the in-season relationship between flow and survival is the rational measure to use for predicting changes in fish survival associated with water withdrawals. Analyses of flow and survival for spring chinook and steelhead within the 2001 migration season are valuable for determining if flow-survival relationships exists. Zabel et al (2002) conducting such analyses concluded "Substantial increases in flow exposure in the middle of the season, for example, did not increase survival for either Snake River spring chinook or steelhead." In Figure 1, the closed points represent survivals for the middle 99% of the total fish migration between Lower Granite Dam and McNary Dam in 2001. The lower ellipse of points represents 1% of the smolts, which passed after June 20 when the Snake River temperatures were above 15°C. In comparison, the Lower Granite Dam average temperature experienced by the fish was 11.3 °C. For survivals calculated from daily Lower Granite Dam passage of spring

chinook in 2001, again there is no survival relationship with flow index (Figure 2). For steelhead, there is no in-season flow-survival relationship (Figure 3). Assuming the regression in Figure 2 represents a flow survival relationship if one did exist, then a one kcfs water withdrawal would change survival a few hundredths of a percent at most. As a practical matter, given the greater importance of other variables, it is not reasonable, even in a low flow year like 2001, to ascribe any measurable adverse effect on fish survival to water withdrawals on the order of 1,000 cfs.

Indeed, even larger withdrawals have should have no impact on fish survival. Since much of the water withdrawn eventually returns to the river as ground water an actual one kcfs loss to the system requires a larger withdrawal. Nearly all municipal water returns to the river as treated water and many irrigation withdrawals return most water back to the river. Finally, the impact of Columbia withdrawals on Snake River salmon and steelhead is reduced further because 50% to 95% of these fish are transported in barges and so they are not affected by river flow or water withdrawals in the Columbia. The net result is that withdrawals from the McNary and John Day reservoirs of any magnitude less than 1,000 cfs, and probably rather more than that have no impact on juvenile salmon and steelhead survival.

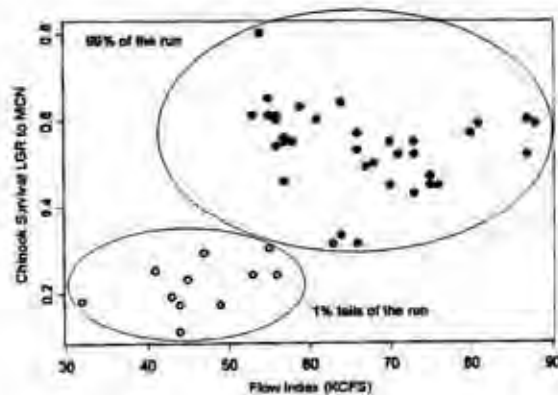


Figure 1. A plot of daily flow and daily survival for Snake River spring chinook in 2001. Data from Figure A.3.1 of Zabel et al (2002). Upper ellipse represents survivals that occurred during 99% of the fish run; the lower ellipse represents survivals that occurred during the tail 1% of the fish run

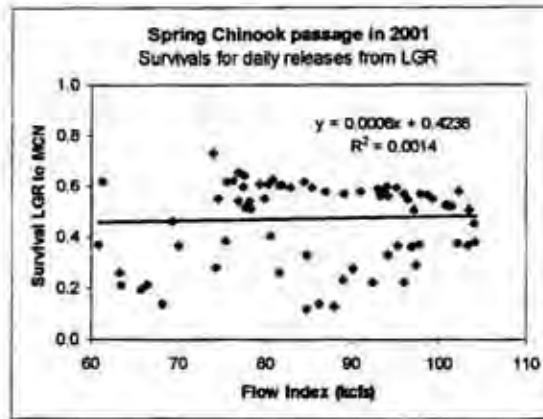


Figure 2. Flow index vs. survival for spring chinook grouped according to day of Lower Granite Dam passage. Data from DART.

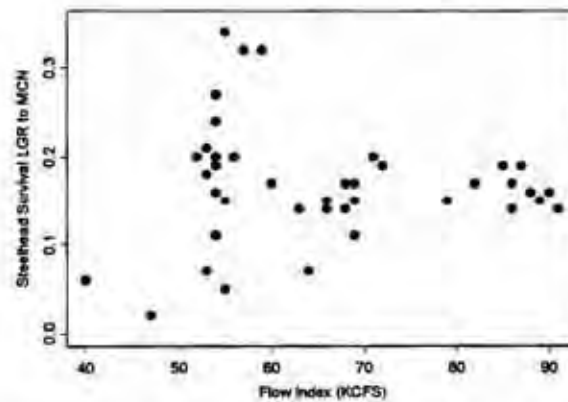


Figure 3. Relationship between daily flow and daily survival for Snake River steelhead in 2001. Data from Figure A.3.1 of Zabel et al (2002).

Analysis of summer flow on survival in John Day Reservoir

Analysis of flows and smolt survival through John Day reservoir in July and August shows no relationship between flow and survival.

Since summer flows are low, there is special concern for the impact of flow on survival of fish passing through system this time of year. The potential impact is illustrated in Figure 4, which plots a John Day Reservoir flow index against the survival of 163 groups of PIT tagged chinook smolts that passed through John Day Reservoir between June 21 and August 8 over the years 1999-2002. Individual and combined year regressions of flow against survival showed no significant relationship with p-values ranging between 0.69 to 0.345 and r-squares from 0.018 to 0.075. The survival vs. flow slopes of the regressions ranged between -0.002 to 0.0019 for individual years and was 0.0004 for the combined year data. Using this latter estimate as the typical flow survival relationship, a one kcfs water withdrawal would decrease survival through John Day Reservoir from 52.60% to 50.56%, which is a change of a few hundredths of a percent.

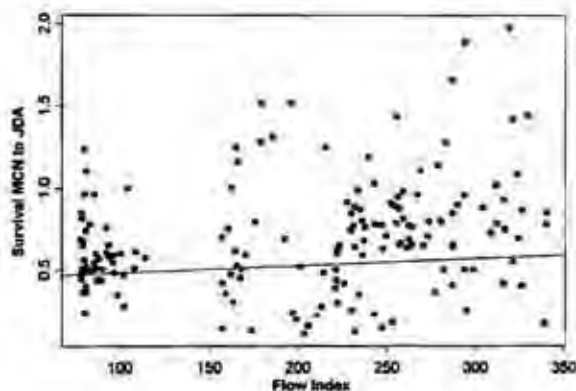


Figure 4. Flow and survival of chinook passing through John Day Reservoir between June 21 and August 8 over the years 1999 – 2002. Weighted regression lines is through all data.

Analysis of the effect of flow on ocean survival in 2001

Comparing jack chinook returns from 2001 to earlier years indicates the low flow had no discernable impact on early ocean survival.

Concern has been expressed that low flow affects the survival of smolts as they enter the ocean. The hypothesis is that the freshwater plume provides habitat in which the smolts feed and avoid predators. Although qualitatively this is a plausible hypothesis, again the evidence suggests that the effect does not exist in any measurable sense, if it exists at all. Simply on the basis of the impact of withdrawals relative to the base flow, it is straightforward to discount the effect of withdrawals on the Columbia River freshwater plume in the ocean. A withdrawal of one kcfs on base flow of 300 kcfs entering the ocean represents a change of 0.3% of the flow into the plume.

The biological response to such a small change cannot be measured, but if river flow did have a measurable affect on ocean survival, it should be evident by comparing data from 2001, which had half the flow of a normal year, to another year with a normal flow. We can infer the level of impact by comparing jack returns in 2001 to returns from 1999 and 2000, which were years with higher flow but similar ocean conditions. Jack salmon are the precocious males that migrate out in the spring of one year and return in the spring of the next. They represent a small fraction of the total run but they are a measure of the success of the year class. For the 2001 smolt out migration, 0.2% returned in 2002 as jacks. In comparison, the jack returns for the 1999 and 2000 out migrations were 0.2% and 0.4% respectively. Furthermore, jack returns in the early 1990s were on the order of 0.05% under normal flow levels.

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**The Flow Survival Relationship and Flow Augmentation Policy in the
Columbia River Basin**

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September, 2002

Corrected 9/9/2002

Flow augmentation and flow targets have been central programs in Columbia River salmon management for more than twenty years. Over this time, water requests have increased from 3.75 MAF in 1983 when the Water Budget was established (NPPC 1983) to between 13 and 16 MAF in the 1995 and 2000 NMFS Biological Opinions (NMFS 1995a; NMFS 2000a). Over the same period, the body of science on the effects of flow grew from a single graph between smolt survival and Snake River flow, to a body of information involving the tagging of a million smolts with survivals measured over the entire salmon life cycle. Whereas the growing body of scientific evidence indicates that variations in flow have no measurable effect on survival of juvenile salmon and steelhead

through the mainstem of the Columbia and Snake, the fish managers continue with their policy of augmenting these flows and have effectively halted further withdrawals of water from the mainstem of the system. In this paper I explore the history of the flow survival research and how political objectives produced a growing disconnect between the research and the water policy.

The development of flow policy

The flow augmentation policy established two decades ago is based on the initial research suggesting small changes in flow are correlated with large changes in fish survival. However, the policy is based on two assumptions 1) a flow survival relationship actually exists and 2) the effect natural flow variations have on survival can be achieved with flow augmentation.

Even prior to the completion of the hydrosystem National Marine Fisheries Service researchers (NMFS) documented the detrimental effect of dams on the survival and travel time of fish during their migration to the ocean. Prior to the construction of the Snake River dams (1964-1974), smolt traveled from the Snake River to the ocean in a matter of days and with the construction of the dams (1974-1994), the travel time extended to several weeks (Figure 1). Concomitant with the increasing travel time the percent of adults returning, designated the smolt-to-adult ratio (SAR) declined. While it was clear that fish suffered mortality as they passed the dams, there was also a concern that the extended travel time contributed to the fish mortality. The hypothesis was that extended travel times increased the exposure of fish to predators and disease and delayed their entrance into saltwater, resulting in additional stress and mortality both in the river migration and in the estuary. Researchers studied survival of smolts from the Snake River to John Day Dam over seven years. Based on two low survivals in years with very low flows they hypothesized that more flow produced higher smolt survival (Figure 2). The hypothesis became known as the Sims and Ossiander flow survival relationship after the NMFS scientists that published the finding in an annual research report (Sims and Ossiander 1981).

At the same time as with the construction of the hydrosystem, the Columbia and Snake River salmon stocks declined and so fish managers sought a number of partial solutions

to restore the runs. The two main actions were limiting harvest and increasing the production of hatchery fish to compensate for habitat lost by the dams. In addition, fisheries managers sought to increase survival by bypassing smolts around the turbines and by speeding their seaward migration by flushing additional water through the river during the spring migration. The initial flow augmentation occurred in 1983, and was based on two premises. One was intuitive. Because smolts migrated during the spring flush and the dams diminished the spring flows, augmentation of the spring flows with water from the storage reservoirs would partially mimic the natural conditions and therefore increase smolt survival. The second premise was quantitative. The Sims and Ossiander flow survival hypothesis suggested great benefits from modest increases in flow. For example, fish managers predicted spring chinook survival would increase 180% with a 47 kcfs increase in flow at Ice Harbor Dam (CBFWA 1990). However, applying the Sims and Ossiander curve to predict the benefits of flow augmentation involved a very important, but unstated, assumption. The Sims and Ossiander curve was derived by plotting yearly averaged flow against yearly average survival and thus represented a relationship between years. Flows between years depend on the amount of rainfall, snow, and the temperature patterns, which together control environmental conditions prior to and during the smolt migration. Thus, a yearly average flow survival relationship involves many factors other than just the flow that the fish experience while migrating through the river. Flow augmentation, however, is produced by shaping the available flow within the season. Thus, by applying the Sims and Ossiander curve to flow augmentation fish managers assumed that the benefits of a wet year could be achieved in a dry year by simply reshaping the timing of the spring runoff.

Two decades ago when the Water Budget began, neither the flow survival hypothesis nor the hypothesis on the equivalence of natural and augmented flows were challenged and in fact they were simply not discussed. However, these assumptions were central to the Water Budget in 1983. Thus, the fish water policies today have a direct lineage to the curve Sims and Ossiander drew through seven data points representing observations of (1973-1979) yearly averaged flows at Ice Harbor Dam against the per project survival of spring chinook and steelhead smolts from the Snake River to John Day Dam.

Testing the hypothesis that survival increases as flow increases

Over the past two decades, flow was hypothesized to affect survival via the effect of flow on travel time, altering the exposure of fish to predators and deleterious river conditions. While studies establish that flow was related to travel time, the Sims and Ossiander flow survival hypothesis could not be reproduced. A weaker relationship between flow measures and SARs was identified but the underlying factors could not clearly be identified which prompted a revision of the flow survival mechanism to include other factors such as estuary arrival timing. Even though the research has not supported the hypothesis, fish managers have not abandoned the flow policy based on the hypothesis but instead increased flows even more based on the hypothesis.

Although the Sims and Ossiander flow survival hypothesis is critical to fish water policy, it has never been precisely formulated, and the hypothesized underlying mechanism has changed over time in response to findings of the flow survival research. In the initial mechanism, it was hypothesized that flow affected survival via its effect on fish travel time: Increased flow decreased fish travel time, which increased fish survival. Petrosky (1992) demonstrated an inverse correlation between travel time of Snake River water and the survival of smolts to adult (SAR) (Figure 1). A paper by Berggren and Filardo (1993) provided support for the travel time mechanism by showing flow and smolt travel time were significantly related for Snake River spring chinook. Hilborn (1993) compared SARs of spring chinook from the Upper and Lower Columbia and concluded the SAR difference between the two reaches was greater for years with lower flows. Cada et al. (1994) reviewed a range of studies and suggested other factors were also of importance, especially temperature. With these reports, NMFS established a flow augmentation policy in the 1995 Biological Opinion (NMFS 1995a, b). The dominant justification was in terms of the flow-travel time link. NMFS used travel time as one of the main performance measures in setting the spring and summer flow targets the hydrosystem required to insure safe passage of smolts. The flow target justification also involved temperature; fish arriving at projects later with higher temperatures would encounter more active predators and could have lower bypass efficiency causing more fish to pass through turbines. Thus, the water policy, up through the 1995 Biological Opinion, was based on a handful of studies that appeared to support the Sims and Ossiander assumption

that increases in flow increase salmon survival. There was no test and little discussion of the second assumption that the benefit assumed from natural year-to-year flow variations could be achieved by reshaping flows within a year.

However, with the development of the PIT-tag marking system, which allowed greater precision in estimating smolt survival, scientists were able to fully test the first hypothesis and partially test the second hypothesis. The first test of the Sims and Ossiander flow survival hypothesis was obtained in Little Goose Reservoir in 1992. It was a low flow year similar to 1973 and NMFS researchers expected survival to be low, but surprisingly, the PIT-tag measured survival was higher than the highest survival obtained in the highest flow year of the Sims and Ossiander study. Results from 1994 also showed very high survival. It is noteworthy that in developing the flow targets for the 1995 Biological Opinion, NMFS rejected the 1993 and 1994 PIT tag studies (NMFS 1995b). However, with each additional year of data, the rejection of the flow-survival hypothesis became stronger: It is now clear that survival of spring chinook and steelhead through the hydrosystem is not related to variations in flow (NMFS 2000b; Bickford and Skalski 2000, Muir *et al.* 2001).

Researchers have reviewed the early studies and found flaws. The strong flow survival relationship in the Sims and Ossiander data (Figure 2) depended entirely on low survivals in the two drought years, 1973 and 1977. A closer look at the historical records revealed these low survivals were likely caused by poor dam passage conditions, not the low flows. Because the dam intakes were not regularly cleaned, larger numbers of tree, branches and other trash, accumulated at the face of the upper most dam on the Snake River (Williams and Matthews 1995). A review of the Petrosky's (1992) travel time and SAR relationship also revealed flaws with the analysis. NMFS used data representative of the current fish passage environment and found a weaker relationship between smolt to adult ratio (SAR) and water travel time (Figure 2) (NMFS 2000b). For the first time NMFS articulated the previously unquestioned second hypothesis stating, "Correlation does not necessarily imply causation (Sokal and Rohlf 1981), and higher SARs associated with higher flows does not necessarily indicate the SARs can be increased by adding more flow to the river" (NMFS 2000b, 53). Skalski, *et al.* (1996) reevaluated the Hilborn *et al.* study (1993) and found that the relationship between SARs and flow

depended wholly on the choice of reference sites. Finally, Giorgi *et al.* (1997) found flow and travel time were not correlated for mid-Columbia fish. Thus, the flow travel time relationship Berggren and Filardo (1993) found for Snake River fish could not be universally applied.

Notwithstanding the plethora of information seriously challenging the data and the theory on which the 1995 Biological Opinion was based, NMFS sustained its policy by concluding "that although a direct flow survival relationship cannot be established by data, it does not preclude benefits of flow augmentation because increased flows may improve survival outside the hydrosystem as a result of earlier arrival to the estuary, improved estuary conditions and reduced delayed mortality (NMFS 2000b, 58)." For the 2000 Biological Opinion NMFS continued to call for flow targets: "These results support management actions to provide flows of at least 85 kcfs in the Snake River and 135 kcfs in the upper (mid-) Columbia River during spring and 200 kcfs in the lower Columbia River during the summer (NMFS 2000b, 57)." Furthermore, NMFS implemented the "no net withdrawal" policy to preclude additional withdrawals of water from Columbia and Snake River Basins.

Newer research shows no flow survival relationship

The newest studies firmly rejected the flow-survival hypothesis. For yearly averaged data, which tests for a relationship between years, both in-river and SAR measures of survival were either independent of flow or exhibited statistically weak increases with flow. However, when comparing weekly or daily averaged data within each year, which tests for a flow survival trend within a season, no relationships were evident whatsoever.

Research published after the 2000 Biological Opinion strengthens the conclusion that flow is not related to survival. NMFS's scientists (Smith *et al.* 2002) wrote, "Correlations between river discharge and survival between Lower Granite Dam and McNary Dam and between travel time and survival were neither strong (within or between years) nor consistent from year to year." However, the paper took particular care to offer alternative theories under which the agency's policy might still make sense: "Thus, survival benefits to the stocks from increased flow in this stretch of the river were at best minimal; any measurable benefits occurred downstream from the Snake River,

(Smith et al 2002)". Going further, the publication speculated that flow augmentation during smolt migration might provide survival benefits in other portions of the salmonid life cycle and in free-flowing sections of the river both upstream and downstream from the hydrosystem. They suggested flow augmentation may improve the arrival timing of fish to the estuary citing a paper by Zabel and Williams (2002) that found the date of fish arrival to Lower Granite Dam in 1995 correlated with rate of return of adults. However, the example is not convincing. Zabel and Williams (2002) also found that arrival date only correlated with survival for in-river passing smolts in one year. For smolts transported through the river the opposite trend existed, the later arriving fish survived better and in 1996, no significant difference was found between release date and returning adults for either transport or in-river groups.

The question remains, then, does flow augmentation directed at fish migrating through the hydrosystem improve survival of fish in the tributaries above hydrosystem, in the estuary, or in the Columbia River plume below the hydrosystem? It is noteworthy that to the present time little research has been conducted to test the hypothesis that flow affects fish outside the hydrosystem (Giorgio *et al.* 2002). However, data does exist to address this issue. First, consider the evidence for a flow-survival relationship above the hydrosystem. Six years of NMFS studies (Muir *et al.* 2001) demonstrated that hatchery spring chinook survival from Snake River tributaries to Lower Granite Dam was significantly related to distance traveled, but not travel time. Since fish survival was not related to fish velocity, the data contradicts the flow/travel time survival hypothesis. Moreover, plotting over ten years spring chinook survival traveling the 116 km distance between Dworshak Fish Hatchery on the Clearwater River to Lower Granite Dam clarifies the picture (Figure 4). The flow survival relationship was flat over the very large flow range of 20 to 140 kcfs. Snake River fall chinook is the only stock exhibiting a correlation between flow and survival to Lower Granite Dam. However, the studies also demonstrated that survival was strongly correlated with release date, temperature, and turbidity (Anderson *et al.* 2000; Dreher *et al.* 2000; NMFS 2000b). These analyses all conclude that with the existing data, flow cannot be identified as the operative variable affecting survival. Furthermore, travel time is not correlated with flow or survival in these data, so if flow were the operative variable it does not act through the

previously assumed mechanism involving exposure time. If flow affects survival, it would most likely work indirectly through the effect of temperature on smolts and their predators and through the effect of turbidity on the water clarity of the habitat. However, flow augmentation from the Hells Canyon Reservoir complex warms the Snake River, which would presumably increase predator activity and therefore decrease smolt survival (Anderson 2000b). The NMFS (2000b) report also noted that the relationship of flow and survival was variable and less pronounced within the hydrosystem between Lower Granite and Lower Monumental dams.

The information available to address the impact of flow augmentation on salmon survival below the hydrosystem is more problematic. For this assessment, several studies have compared the SARs or the log of the ratio of the recruits to spawners ($\ln(R/S)$) with flow measures. However, if such correlations exist flow is not necessarily the causative factor. Changes in the hydrosystem over the years of observation and the natural variability in the ocean conditions that may correlate with the wet and dry years, and therefore, make it impossible to establish a clear cause and effect relationship between the natural year-to-year variations in flow and these indicators of survival (NMFS 2000b). Confining the analysis to years representative of the current hydrosystem, several studies show a relationship between SAR or $\ln(R/S)$ and a measure of flow during the migratory season. However, as noted a number of factors preclude associating the relationship with in river flows. NMFS (2000b) found over the years 1974-1994 a weak statistical relationship between water travel time and SAR for spring chinook but not for steelhead. Snake River fall chinook survival, expressed as the residuals of the spawner recruit curve, was uncorrelated with the flow during smolt migration (Anderson Hinrichsen and Van Holmes 2000), while for Marsh Creek spring chinook a relationship was found (Petrosky 1991). With selected data, yearly averaged relationships between flow and adult survival measures may or may not be found, but since about 90% of the Snake River smolts were transported, their exposure to the river environment was very limited. In contrast, Mid-Columbia stocks are not transported and they have flow-survival correlations. However, in the years of these studies the low flows correspond to warm ocean conditions, which produce poor salmon survival in the ocean (Mantua and Hare 1997, Anderson 2000). Therefore, survivals that correlate with high flows also correlate

with years of better ocean survival. NMFS sums up the SAR flow information up through 2000 as follows, "While it is not possible to establish a clear cause and effect relationship with these [SAR and $\ln(R/S)$] data, it is not possible to rule one out" (NMFS 2000b p 54).

However, the real question is not whether SAR is related to the natural year-to-year variations in flow, but whether SAR is related to flow augmentation. Germane to this question is the recent data on in-season flow and SAR, which was not available when NMFS prepared the white paper (NMFS 2000b). With nearly 700,000 run of the river PIT tagged salmon and steelhead smolts and 5000 adult returns it is now possible to explore whether an in-season flow SAR relationship exists for Snake River fish. Figure 5 shows the results for in-river passing wild spring chinook over the years 1995 to 2000. The data represent averages of groups of fish that passed Lower Granite Dam weekly. Regression lines of weekly averaged SAR vs. weekly averaged flow for each year reveal no flow survival pattern within a year or between years for Lower Granite Dam flows ranging between 50 and 200 kcfs.

Models and the flow augmentation hypothesis

Since the flow-survival studies conclusively demonstrate that the effect of flow augmentation on fish survival above, below, or within the hydrosystem is so small, if it exists at all, as to be unmeasurable, models must be used to assess the incremental and cumulative impact of flow augmentation. Since models are simplified, but quantitative, representations of our understanding, as the data improves, the models are updated and revised. The first models developed by NMFS twenty years ago reflected the extremely limited data available and predicted a strong flow-survival relationship. The models now used by NMFS and the Region, which are based on an additional decade of high quality data, contain no flow-survival relationship whatsoever. Analysis also indicate even moderate water withdrawals should have virtually no impact on fish survival.

It is important to realize that the flow augmentation volumes released from upstream reservoirs are extremely small compared to the natural variations in flow, and the irrigation withdrawals at issue in this action are smaller still. Consequentially, since the relationship of survival and flow is inconclusive over the scale of year-to-year variations

and flow and survival are uncorrelated over the seasonal scale, it is virtually impossible to measure the impacts of flow augmentation on fish survival. Therefore, with present technology the second assumption that varying flow through augmentation produces the same effect as natural variations in flow is untestable. Thus, to extrapolate information derived from natural variations to flow augmentation we must use models. NMFS developed the first model of flow augmentation, which was no more than a fit of a two-parameter equation through seven data points (Figure 2) (Sims and Ossiander 1982). The equation is empirical, it has no basis in fish ecology, but fish managers readily accepted it as a valid description of the impacts of flow on smolt survival through the hydrosystem.

In the 1990s, two juvenile passage models, FLUSH and CRiSP, were developed or revised for use in the PATH process, a regional workgroup charged with evaluating the impacts of dam removal on the recovery of Snake River salmon (Marmorek 1998). The FLUSH model assumed that the fish mortality rate, the percent of the remaining population that dies each day, increases the longer fish are in the hydrosystem. The CRiSP model assumed mortality rate is constant over the migration. The FLUSH model, like the early Sims and Ossiander empirical model, produces a strong flow-survival relationship while the CRiSP model has a relatively weak flow-survival relationship. Because at the time of PATH there were no measurements of fish through the entire extent of hydrosystem, scientists calibrated the two models with the available data, which extended halfway through the hydrosystem. Due to the nature of the models, they produced essentially the same survivals to the midway point, but because the mortality rate in the FLUSH model strongly increases with fish travel time the predicted survival through the entire hydrosystem was less than half the CRiSP model prediction (~ 20% survival for FLUSH and ~40% survival for CRiSP). A panel charged with reviewing the two models believed that smolt mortality should increase strongly with travel time through the hydrosystem and weighted the FLUSH model over the CRiSP model.

After the PATH review, survival estimates over the entire hydrosystem were finally available to test the two models. NMFS estimated juvenile spring chinook survival from the tailrace of Lower Granite Dam to the tailrace of Bonneville Dam was 48% for the 1997 migration. The two model teams then provided their prediction. CRiSP model

developers estimated survival was 59% and the FLUSH model developers estimate survival was 24%. In the next two years, NMFS provided additional hydrosystem survivals, which the CRiSP model team compared to their model predictions. For the 1998 smolt passage, the NMFS estimate was 63% and the CRiSP prediction was 49%. For 1999, the NMFS estimate was 56% and the CRiSP prediction was 54% (CBR 2000). The FLUSH modelers did not provide model either year, but by reverse engineering the FLUSH model (the actual model was never released to the scientific community), the estimated survivals for the two years would be below 15%. The results are clear, the FLUSH model and PATH scientific review panel's weightings are not supported by the survival studies.

NMFS was well aware of the failure of the FLUSH model and the difficulties of the PATH process so they develop an alternative model, SIMPAS, which is based on PIT tag survival studies between 1992 and 1999 (NMFS 2000c). Most significant, the SIMPAS model describes survival through the hydrosystem on a per kilometer basis. That is, the new NMFS model contains no flow survival relationship whatsoever. Furthermore, NMFS used SIMPAS in developing the 2000 Biological Opinion.

Thus, over two decades of modeling the impacts of the hydrosystem on juvenile salmon migration NMFS has progressed from a model with a very strong flow-survival relationship to a model with no flow-survival relationship. This surprising result may seem at first counterintuitive. NMFS in 1980, and the PATH review panel in 1997, both believed that fish mortality through the hydrosystem depends on how long it takes smolts to migrate through the system. In addition, both groups of researchers believed that the rate of mortality strongly increased over time so that the majority of the fish must die at the bottom of the hydrosystem. How then can survival be independent of the migration time? Anderson and Zabel (in review) developed a mathematically rigorous and intuitive explanation. Simply put, they showed that smolt survival is independent of travel time if the predators are essentially stationary. In this case, the smolts must pass a gauntlet of predators and the total mortality does not depend on how fast the smolts migrate but on how many predators they encounter while passing through the hydrosystem gauntlet. (It should be noted that predator densities are in fact higher below the dams than within the hydrosystem; migrating salmon experience a gauntlet nearly everywhere they go.)

Against the gauntlet description, flow proponents have suggested that fish mortality increases with passage time as a result of cumulative stress experienced by the migrating fish (Budy et al. 2002). Although questions on the significance of stress are yet to be resolved we can summarily disregard the contribution of flow augmentation and water withdrawals to the fish stress levels because these actions only change the total travel time of the fish by minutes over a total migration of weeks.

Over the last few years, the CRiSP model has been used to estimate the impacts of flow augmentation and water withdrawals on smolt survival and in each case, the impacts are insignificant (Anderson 1999). For example, a 147 cfs withdrawal from the mid-Columbia was estimated to reduce adult returns by less than 9 fish out of a population of a half million and the travel time would be increased by minutes.

The new data and model trim even these estimates. From our recent studies, smolt mortality depends more on distance traveled than travel time, and the predicted impacts of flow augmentation in the updated model will be about 75% less than the impacts predicted in the previous model. Thus, where the CRiSP 1.6 model predicted a 9 fish loss the updated model, CRiSP 1.7, will predict about a two fish loss. However, even this miniscule modeled loss is higher than what is expected to happen in the real world. In previous evaluations of the impact of flow augmentation, we assumed that water withdrawn for municipal or agricultural uses is lost to the system. In fact, the majority of water pumped from the mainstem of the Columbia River system returns to the system, either as treated water or as ground water recharge. Thus, the impact need to be lowered in proportion to water actually lost relative to the amount withdrawn. In the above example, the predicted impact of a 147 cfs withdrawal is expected to be less than one adult salmon. Alternatively, using the new NMFS SIMPAS model the impact is zero fish lost.

Is the addition or loss of one or even a hundred adult salmon out of a population of a half million significant to the salmon populations? On an intuitive level, the answer is clearly no. Using models, NMFS recently concluded that recovery of Snake River salmon was not dependent on further improvements in hydrosystem survival (Kareiva *et al.* 2000). Moreover, NMFS has also concluded that even large reductions in adult returns are not

significant to recovery, as evidenced by the fact NMFS allows the in-river harvest of thousands of salmon in the mainstem of the Columbia River that would otherwise reach their final destination in a few weeks.

The disconnect between policy and science

While the cumulative body of scientific information all points to flow not affecting survival in any meaningful context, the policy of reducing water withdrawals and augmenting river flow has continued to expand. Furthermore, fish and water managers have consistently acted to discredit or ignore the information against their policies

The hypothesis that higher flow will improve fish survival was first proposed in 1981 which led to the establishment of the Water Budget in 1983. Over the next two decades, only five additional studies and reports provided any indirect support for the hypothesis while more than twenty studies have directly refuted the hypothesis (Table 1). The evidence is now overwhelming to reject the hypothesis and the contention that flow augmentation and water withdrawals in the mainstem of the river system have any impact on salmon. However, over this same period the fish and water managers have increased the flow augmentation and implemented stringent regulations stopping water withdrawals (Table 1). Furthermore, as the research has serially addressed and rejected the hypothesis on which the water policy was based the managers have reformulated the hypothesis into more nebulous forms.

In 1983, the justification for the water budget was to speed fish down the river to increase survival. When this was shown to be false, the justification was switched to an impact on adult returns (SARs). When it became clear that the benefits of water policy could not be demonstrated in terms of adults returns the managers shifted justification saying that the research could not rule out benefits (“While it is not possible to establish a clear cause and effect relationship with these [SAR and $\ln(R/S)$] data, it is not possible to rule one out” (NMFS 2000b p 54)). When models demonstrated that the benefits of water policy were insignificant managers rejected the model (in the case of CRiSP) [Barwin transcript] or simply ignored the model (in the case of SIMPAS). When models predicted miniscule impacts managers challenged the conclusions applying a *reduction ad absurdum* proof, noting that a miniscule impact is significant if the entire river is withdrawn. In the face of

the accumulating evidence *against* the benefits of flow, managers continue to rely on non-deductive logic, statements of belief, and qualitative extrapolations: "Additional water withdrawals have the probable affect of exacerbating the situation thus delayed or prevent recovery of listed fish" [Barwin transcript]. Consistently, as new information emerges refuting the flow-survival hypothesis, the fish managers mount attacks on the data and its analysis in hopeless attempts to defend what has become the unsupportable foundation of their policies.

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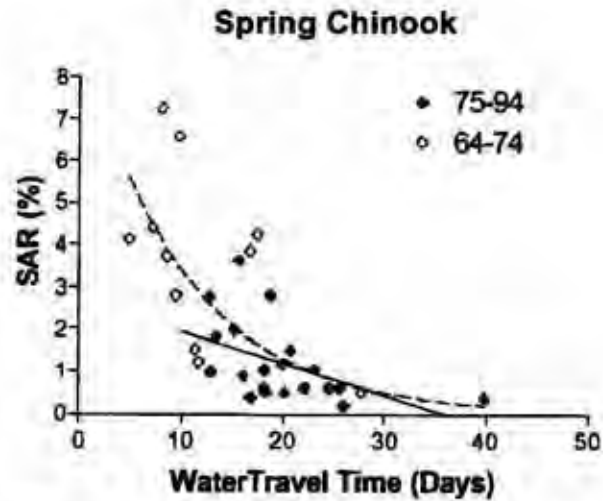


Figure 1. Regressions of smolt-to-adult returns versus water travel time for Snake River spring/summer chinook salmon for the 1964-1994 smolt migration (after Petrosky and Schaller 1998). The dashed line represents the regression line for the entire period; the solid line is for the years 1975-1994. From NMFS (2000b).

Table 1. History of Flow-Survival Relationship Key Studies and Program/Plans

Year	Evidence for flow-survival hypothesis and policy	Evidence against flow survival hypothesis and policy
1981	Sims and Ossiander 1981 (73-79 Spring Chinook Studies)	
1983	NPPC 1983 Fish & Wildlife Program* (Policy)	
1990	CBFWA 1990 Integrated System Plan	
1992	Petrosky 1992 (Adult Returns Rates Correlated with water Travel Time in Snake River)	Marsh and Achord 1992 (First PIT-tag Study Shows High Survival with Low Flow)
1993	Hilborn et al. 1993 ; (Fall Chinook Flow-Travel Time Relationship) Berggren and Filardo 1993 Snake River spring chinook travel time decreases with flow	
1994	Ceda et al. 1994 (Review from Several Systems Conclude Flow and Other Factors Affect Survival)	Giorgi et al. 1994 (No Flow-Travel Time Relationship in mid-Columbia) Olsen and Richards 1994 (Ocean Conditions affect West Coast Chinook)
1995	NMFS 1995 BiOp* (Proposed Flow Targets) (Policy)	Williams and Matthews 1995 (1970s, Low survival from Trash at Dams) Skalski et al. 1995 (Fall Chinook Survival Depends on Comparison Stock)
1997		Smith et al. 1997a (1993-1997 Data Shows No Within-Year Flow Survival Relationship for Spring Chinook) Giorgi et al. 1997 ; Smith et al. 1997b (No Within-Year Flow Survival Relationship in Fall Chinook) Mantua et al. 1997 (Ocean Regime Shifts Alter Salmon Production is an Alternative Reason for Stock Decline)
1998	Marmorek et al. 1998 (FLUSH Passage Model Predicts Strong Flow Survival Relationship)	Marmorek et al. 1998 (CRISP Passage Model Predicts Weak Flow Survival Relationship) Olsen et al. 1998 (Comprehensive Review of the Flow Program Questioning Policy, Hydrology, Biology, and Economics)
1999		NMFS obtains first estimate of smolt survival through the entire hydrosystem and requests FLUSH and CRISP project survivals for model tests, FLUSH error is 3 times greater than CRISP error.
2000	NMFS 2000a: BiOp* (Continues with Flow Targets and Flow Augmentation Proposed in 1995 BiOp plus established a no net withdrawal policy) (Policy)	NMFS 2000b (No Flow Survival Relationship for Snake River Spring Migrants for 1995-1999) NMFS 2000a (NMFS Adapts SIMPAS Model in which Smolt Survival Depends on Distance, Not Travel Time) Anderson et al. 2000; NMFS 2000b (Snake River Fall Chinook Survival to LGR Dam Not Related to Travel Time, Survival has Highest Correlation with Release Date and Water Quality Parameters, which covary)
2001		Muir et al. 2001 (Hatchery Chinook Survival Varied Inversely with Distance to LGR Dam. Hydrosystem Survivals in 1990S Equal Survivals in the 1960s and Little Mortality Occurs in Reservoirs) Williams et al. 2001 (Survival Increases from 1970s to 1990s not Accompanied by Change in Flow)

2002	Fisheries Agencies challenge the Giorgi 2002 report	Giorgi et al. 2002 (Review of Data determined that little evidence for supporting flow survival relationship across water years 1993-2002 for yearling chinook and steelhead) Smith et al. 2002 (Between Lower Granite and McNary Dam flow survival relationship with the in season or between years) Anderson and Zabel <i>In review</i> (Smolts pass a gauntlet of predators making survival dependent on distance not travel time)
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* Fish migration and recovery programs.

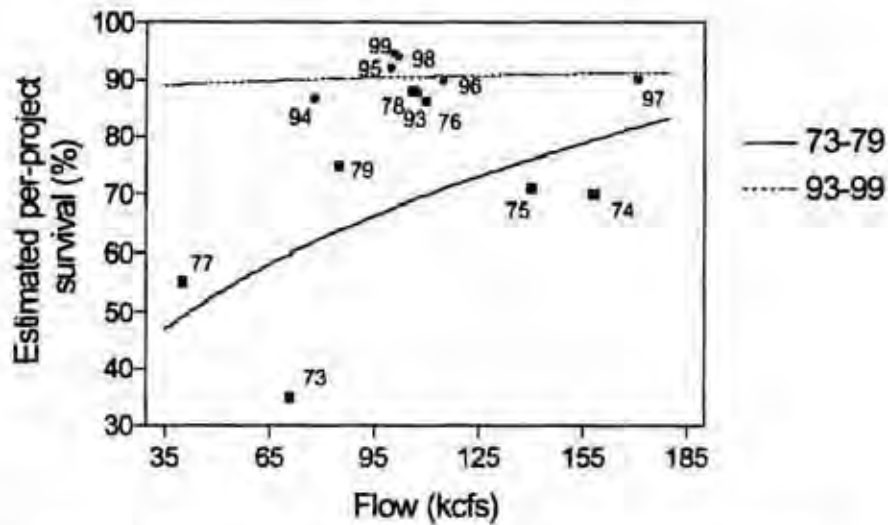


Figure 2. Historical and recent estimates of per-project survival (%) for yearling chinook salmon vs. index of Snake River flow (kcfs). Curves depict fitted nonlinear regression equations describing relationship between flow and survival in the two time-periods. Early period data from Raymond (1979) and Sims and Ossiander (1981). Graph from NMFS (2000b).

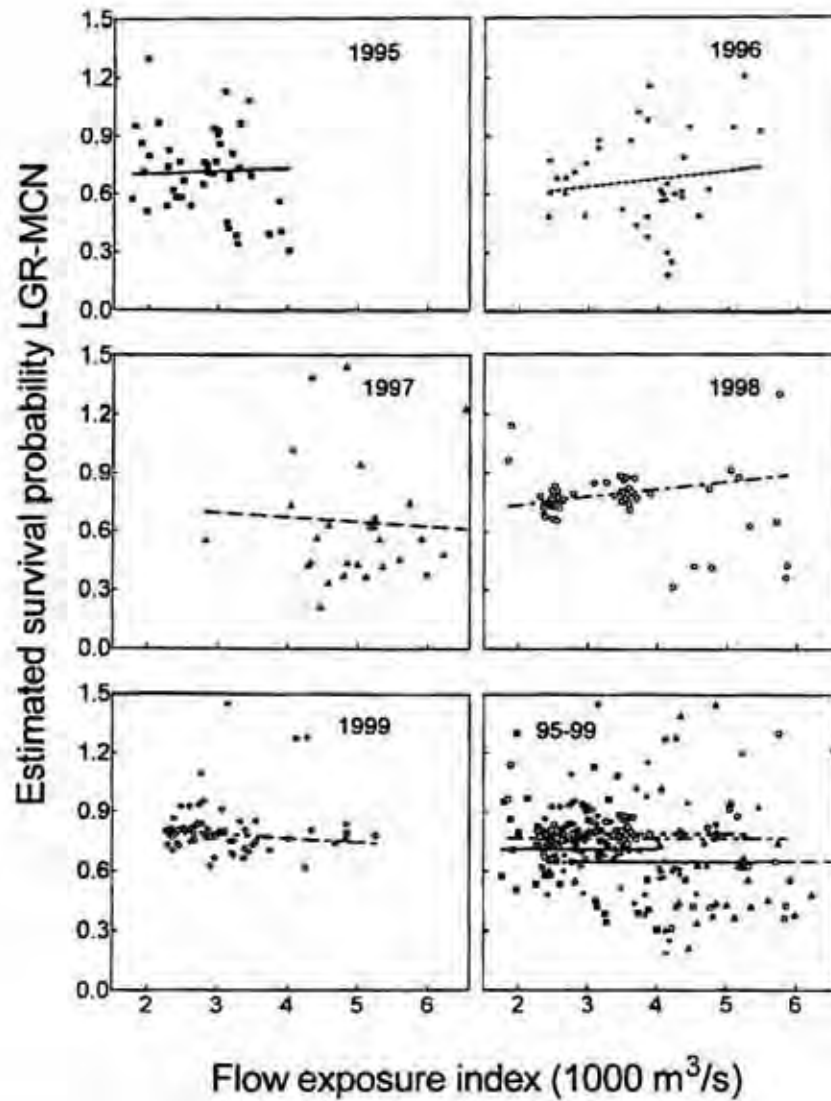


Figure 3. Relation between estimated survival from Lower Granite (LGR) Dam to McNary (MCN) Dam (d) and flow exposure index measured at Lower Monumental Dam for yearling chinook salmon, 1995–1999. Lines in the lower right panel depict the linear regression model identified in the model selection sequence. Regression lines are from weighted analysis (Figure from Smith et al 2002)

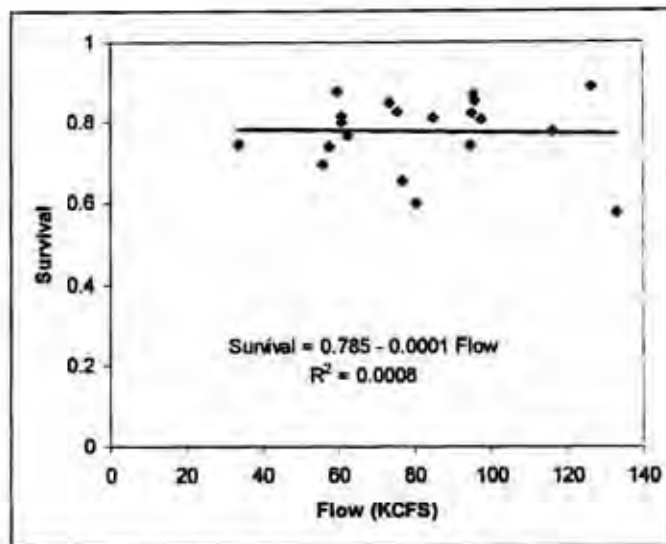


Figure 4. Relationship of flow to spring chinook smolt survival from Dworshak Hatchery to Lower Granite Dam for 10 years of PIT tag data from 1990-2001.

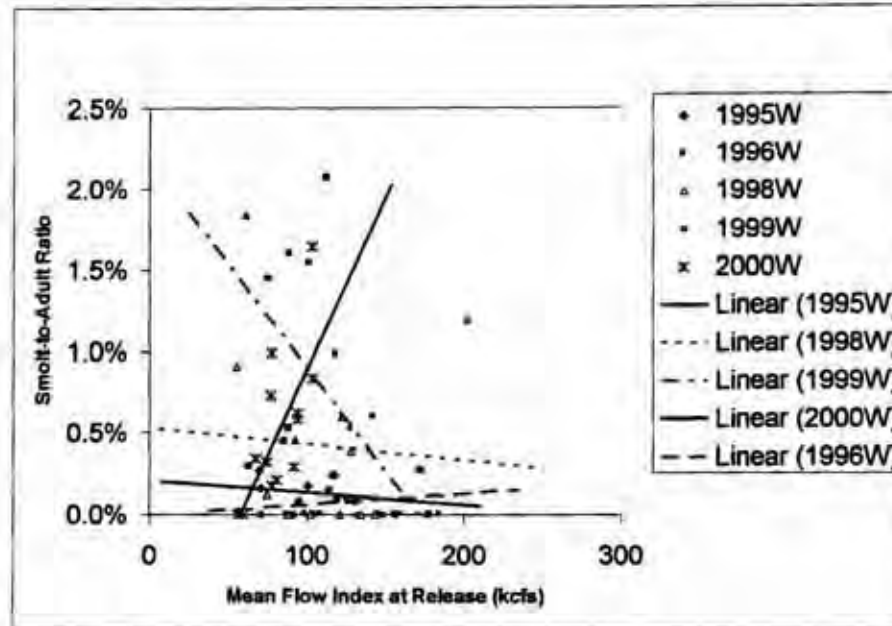


Figure 5. SAR vs. LGR flow index for PIT tagged spring chinook salmon tagged at Lower Granite Dam for between 1995 and 2000.

COMMENT SL 04



Ferry County Natural Resource Board

350 East Deleware

P.O. Box 115

Republic, WA 99166

April 9, 2003

Bureau of Reclamation
P.O. Box 815
Ephrata, WA 98823

RE: Flow Augmentation of Banks Lake

Whereas: A Memorandum of Understanding exists between Environmental Protection Agency, DOC (NOAA) National Marine Fisheries Service, USDI Fish & Wildlife Service, USDA Forest Service and USDI Bureau of Land Management, to cooperatively implement "*The Interior Columbia Basin Strategy*" and;

Whereas: This *Strategy* complements other efforts that address natural resource issues within the Columbian Basin, e.g., Federal Caucus All-H Paper, Northwest Power Planning Council, PACFISH/INFISH Biological Opinions, State Recovery Plans and;

Whereas: The planning principles and guidance contained in "*The Interior Columbia Basin Strategy*" are based on *Integrated Scientific Assessment for Ecosystem Management* (PNW-GTR-382, 9/1996), of the *Klamath and Great Basins (Volumes 1 through IV, 1997)*, and all reports generated by the Interior Columbia Basin Ecosystem Management Project; are hereinafter referred to as the **ICBEMP Science** which includes Basin Wide Salmon Recovery and flow augmentation of 29 federal dam reservoirs, and;

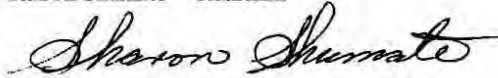
Whereas: Actions implementing the ICBEMP Science of Flow Augmentation affects Five States with a landmass of 144 million acres of private and public lands and is proposed to extend to the year 2012 and;

Whereas: National Marine Fisheries Service "Biological Opinion" for Basinwide Salmon Recovery Strategy of the Multi-Species Framework Project of 1999 – US Bureau of Reclamation states: Annual Estimated Costs; Agricultural Losses - \$100-\$200 Million **annually**, Recreation Losses - \$5-\$15 Million **annually**, Employment Loss – 2,000-4,000 jobs **annually**, Navigation Losses - \$25-75 Million **annually**, Lost Electricity Generation - \$0.5 **Billion** to \$1 **Billion annually**.

01

Therefore: For the economic stability of the Pacific Northwest and the NATION, based upon the preceding facts presented, we urge you to refuse the recommendation of the North West Power Planning Council to release 130,000 acre feet of water from Banks Lake into the Columbia River late this summer as this action will contribute to agricultural, recreation and employment losses for the entire Columbia River Basin

Sharon Shumate – Chairman



Ferry County Natural Resource Board

cc: State Senator Bob Morton
State Representative Bob sump
State Representative Cathy McMorris

U.S. Congressman George Nethercutt
U.S. Congressman Richard "Doc" Hastings
U.S. Senator Patty Murray
U.S. Senator Maria Cantwell

NATIONAL MARINE FISHERIES SERVICE**"Biological Opinion"****BASINWIDE SALMON RECOVERY STRATEGY****Area Affected – 144 Million Acres****Five States, Eight Groups of Counties,
Tribal Reservations****"ANNUAL" ESTIMATED COSTS
BUREAU OF RECLAMATION 1999**

Draw Down 29 Federal Dam Reservoirs on Columbia River and All Tributaries – Flow Augmentation

- AGRICULTURAL PRODUCTION LOSSES - \$100 Million - \$200 Million
- LOSS TO RECREATION - \$5 Million - \$15 Million
- EMPLOYMENT LOSS – 2,000 TO 4,000 JOBS
- NAVIGATION LOSSES - \$25 MILLION TO \$75 MILLION
- LOST ELECTRICITY GENERATION - \$0.5 Billion to \$1 Billion

Document Quoted – US Bureau of Reclamation – Multi-Species Framework Project – 1999

COMMENT SL 05

From: Patricia Shults <pshults@co.franklin.wa.us>
 To: 'Bureau of Reclamation' <jblanchard@pn.usbr.gov>
 Date: Fri, Apr 11, 2003 12:45PM
 Subject: BANKS LAKE DRAWDOWN

The Franklin County Commissioners strongly concur with the Grant County Commissioners position. Please read the following letter.

Signed:

Sue Miller, Chairman
 Neva J. Corkrum, Chairman Pro-Tem
 Frank H. Brock, Member

Wildlife

The drawdown occurs at peak fishing/tourism season and would devastate the local communities along the lake, on the major Highway Routes of Highways 2, 17, and 155. Without the ability to generate revenue and taxes, these communities lose their tax base and the ability to survive. The Action Alternative will create a large shoreline of mud and stagnant water pools, the breeding grounds for mosquitoes. Nowhere in the EIS does it address the issue of mosquitoes, the mosquito born disease West Nile Virus. This virus has reached Washington and documented cases of infected horses and crows have occurred. Experts expect to document human cases and other bird cases in 2003. The EIS makes no attempt to document any impacts, or casual effects of this mosquito borne virus on humans, animals, or birds. No strategy of the use of pesticides, or the impacts is given. Alternative supplies of water to enhance flow augmentation are available from dam and reservoir release in Canada. Needlessly threatening the health of humans, animals, and birds makes no sense.

01

02

Banks Lake is a known habitat for the endangered specie, the Bald Eagle. Northrup Canyon, near the north end of Banks Lake supports a small but surviving population of our country's national bird, the Bald Eagle. Impacts to the Bald Eagle as a listed endangered species and potential negative ramifications must be researched. Prior to the arbitrary choice of any one of the Action Alternatives, it would be prudent to determine the impact any Action Alternative may have on currently listed, dependant species. This may include the recently listed pygmy rabbit populations in neighboring Douglas County. Will decreasing the level of Banks Lake effect down gradient, dependant watering sources during the hottest driest time of the year? Hydraulic continuity of underground aquifers is not addressed in any of the Action Alternatives. There are a number of similar questions left unanswered or omitted in this draft EIS. The Action Alternative could have a negative impact to not only animals but also the Bald Eagle.

03

Social Environment

While recreation opportunities will decline at Banks Lake during the period of drawdown, especially the Coulee Community, other opportunities for water-based recreation are nearby. The problem with the nearby opportunities is they are already heavily used. It is a fallacy to believe there is other nearby recreational opportunities that Bank Lake has to offer. Overall impact to the Northern Region of Grant County economy will be great. This area depends on tourism/recreation. While lost income for the businesses will negatively affect their financial viability; the degree of impact will depend in part upon their ability to adapt their facilities to the lower lake levels in August. It will be extremely difficult to adapt their facilities with a drop in income. Grand County, the City of Coulee City and the Port of Coulee have invested a large amount of money in infrastructure in the park, camping area, boat facilities and the swimming area. This was to attract tourism/recreation and create jobs for the Coulee Community. The Action Alternative will adversely affect this investment. It will also adversely affect the low-income in the Coulee Community as explained in the environmental justice section and economic section. The social value of those who desire increased water for endangered salmon will have a minimal effect. The additional drawdown in the Action Alternative will only supply an additional one to two percent flows at McNary Dam. The Snake River fall Chinook juvenile migration tends to peak in mid-July with numbers tapering off into mid-August. Nearly half of the Snake River fall Chinook can be transported from the Snake River collector dams and will not benefit from flow augmentation from the Columbia River. In addition, there is uncertainty surrounding flow augmentation benefits for fish survival. Therefore, the social value of the Action Alternative will be nil.

The Action Alternative will negatively impact the recreational opportunities and economy of the Northern Region of Grant County. The local governments have made large investments in infrastructure to increase tourism thereby creating jobs. Again the Action Alternative will negatively impact this. The drawdown in August and part of September to increase flows of one to two percent to help salmon when their peak migration is mid-July has no social value, especially when you can barge them and there is uncertainty surrounding flow augmentation as a benefit.

Grant County government, which is responsible for our public's health, safety and general welfare, is very, very concerned over the potential negative impacts the Action Alternatives hold for our citizens!

We are also doing our best to understand the process we and our citizens are being forced to endure.

First, a biological opinion was produced which included a theory or hypothesis that increasing the river flow would support more fish.

Second, action plans are developed to support the theory presented in the biological opinion.

Third, the public, dependent on the river's water, is put through numerous processes to defend their uses of this water.

07

Fourth, studies designed to support and reinforce the biological opinion theory have repeatedly missed the mark and are non-conclusive and are generally questioned by the scientific community.

Common sense must prevail in this process.

1. Put this draft EIS on hold;

2. Prove or disprove the biological opinion theory;

08

3. Then study the impacts of all Action Alternatives; and

09

4. Address and mitigate all impacts raised during the EIS process, including our populations, customs and culture.

In conclusion, in 1998 the legislature passed, and Governor Lock signed, ESHB 2496, an act relating to salmon recovery. In passing the Salmon Recovery Act, the legislature declared that the state should "retain primary responsibility for managing the natural resources of the state, rather than to abdicate those responsibilities to the federal government." This law set up a voluntary and locally-based salmon habitat restoration process, led by lead entities consisting of counties, cities, and tribal governments. The function of the entities is to develop a list of projects that help restore and protect habitat for fish within a Water Resource Inventory Area. The Act also created our state's Independent Science Panel to "help ensure that sound science is used in salmon recovery efforts."

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Independent scientific review provides decision makers with technical feedback and perspectives that do not reflect a particular vested interest or point of view. The Independent Science Panel was established under the Salmon Recovery Act of 1998; its purpose is to provide scientific review and oversight of the state's salmon recovery efforts and to review the adequacy of the salmon recovery plans developed by the state. Other independent science bodies have been established and are operating in the Columbia River Basin; they were established under the Northwest Power Planning Act to advise the Power Council and its fish and wildlife program, and to review projects proposed for funding. The Governor's Salmon Recovery Office will review the role of the Independent Science Panel to ensure their work is aligned with the most pressing needs facing the state and report to the Governor by April 15, 2003. It seems premature to implement the Action Alternative prior to the Independent Science Panel report to the Governor. The Action Alternative will negatively impact the Coulee community customs and culture. Grant County is demanding that those customs and culture be preserved under NEPA.

The Action Alternative is contrary to elements of our Comprehensive Plan. It is in conflict with our policies and goals of our Policy Plan. It is in conflict with our policies and goals of the Economic Development element. It is also in conflict with our policies and goals of our natural settings. The Action Alternative will negatively impact the visual quality, environmental justice, social environment, wildlife and the local economy of the Coulee Community. The negative impact of the Action Alternative far out weighs the minimal, uncertain benefits to salmon.

10

CC: "ofields@grantcounty-wa.com" <ofields@grantcounty-wa.com>

COMMENT SL 06

Commissioners:
MICHAEL DONEEN
T. JAMES DAVIS
LYNN M. HEMINGER

Chief Executive Officer/Manager:
WILLIAM C. DOBBINS



Public Utility District No. 1 of Douglas County

1151 Valley Mall Parkway East Wenatchee, Washington 98802-4497 509/884-7191 FAX 509/884-0553

April 1, 2003

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
P.O. Box 815
Ephrata, WA 98823-0815

Dear Mr. Blanchard:

Public Utility District No. 1 of Douglas County provides electric service to the residents and businesses of Douglas County Washington. A number of our customers in eastern Douglas County rely on the services available at Coulee City. The economy in this area is based on dry land wheat and cattle operations. The agricultural economy has been depressed for several years with no relief in sight. While these farmers do not rely on the Columbia Basin Project for irrigation purposes, recreational traffic related to Banks Lake has helped to make support service businesses in Coulee City economically viable. The summer months are the most active tourist season. The proposed 10-foot drawdown during these months will jeopardize the employment and availability of services for many of our rural customers.

Douglas PUD respectfully requests that the drawdown proposal be modified to assure continued viable operation of all recreational facilities on Banks Lake. Thank you for consideration of our concerns.

Sincerely,

William C. Dobbins
CEO/Manager

Ped 17691

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COMMENT SL 07



GRANT COUNTY
OFFICE OF
BOARD OF COUNTY COMMISSIONERS
POST OFFICE BOX 37
EPHRATA, WASHINGTON 98823
(509) 754-2011

April 10, 2003

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street
P O Box 815
Ephrata WA 98823-0815

Hand Delivered

RE: *Grant County's Comments on Banks Lake Drawdown*

Dear Mr. Blanchard:

Enclosed you will find Grant County's Comments on the Bank Lake Drawdown for your consideration. Please feel free to contact me if you have any questions.

Sincerely,

BOARD OF COUNTY COMMISSIONERS



Tim Sneed

for

Enclosure

TIM SNEAD
DISTRICT 1

DEBORAH MOORE
DISTRICT 3

LEROY ALLISON
DISTRICT 2

"PROVIDING THE PUBLIC SAFE, RELIABLE, RESOURCE EFFECTIVE LOCAL GOVERNMENT SERVICES WITH INTEGRITY."

Grant County's

Comments on

Banks Lake Drawdown



Prepared by:



Tim Snead, District 1
Member, Board of County Commissioners

4/9/2003

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1. May 31, 2001, letter to Jim Blanchard, Bureau of Reclamation, regarding *Request to participate in NEPA Process as a Cooperating Agency*
2. Grant County Board of Commissioners Resolution/Ordinance No. 01-172-CC

Customs and Culture

Grant County customs and culture, as defined in our Comprehensive Plan:

The land and water are the lifeblood of Grant County. Our culture, customs, history, future, way of life and economy are dependent upon the land, the natural resources and an effective partnership empowering local stewardship of the land and its resources.

Much of what is best about our county is rooted in rural community life and the never-ending quest for fulfillment of the "American Dream." The history and culture of Grant County exhibits traditional conservative values and attitudes, emphasizing courage, independence and individual freedom, initiative, hard work, stamina, perseverance, endurance, resourcefulness, patriotism and spirituality. The culture of Grant County and Central Washington reflect the original pioneer spirit of the early settlers, which continue to present day. The wilderness and desert were claimed by people as rugged as the land itself. Our heritage, our customs and culture is the legacy of their struggles, disappointments and triumphs.

The People of Grant County believe in:

1. Traditional American values;
2. Family;
3. Government serving the people;
4. Strong rural communities;
5. service to the community;
6. Preservation of our way of life;
7. Democracy and individual freedom.

We value:

1. Human dignity;
2. Our quality of life;
3. Our history, customs and traditions;
4. Equity, honesty and integrity;
5. Education;
6. spirituality;
7. The land, environment, and natural resources;
8. Law, justice and order.

We encourage:

1. Respect for human dignity and equal opportunity;
2. Balanced growth and development in harmony with the environment;
3. Balance between too little and too much government;
4. Preservation and the protection of the environment;
5. Protection of private property rights;
6. Economic development and prosperous communities, cities and towns;
7. Best use of the land.

Coulee City, the oldest town in Grant County, is situated at the middle crossing of the Grand Coulee, the only place within 60 miles where the Coulee can be crossed easily. An artesian spring lured the first Indian people. Later the settlement became a trading center for cattlemen, a construction camp for two competing railroads and then a stop-over for settlers making their way west. The winter of 1889-90 marked the transition

from cattle raising to grain, fruit and a more diversified agriculture base. Upon completion of the Grand Coulee Dam, Banks Lake Reservoir was filled in the 1950's.

The head gates at Coulee City supply irrigation water to the Columbia Basin Reclamation Project.

The Coulee City community has changed over the years from a cross-roads settlement, to cattle raising ranches to wheat products, to a community that has come to rely on Banks Lake. It is still a farming community, but tourism and recreation is just as important to this community. A survey was sent out to the people that live in the community and 110 people responded.

1. How many times each week do you and your family use Banks Lake during the months of August and September: *People use it an average of 27.5 times.*
2. How many times each week do you and your family use the swimming area at the Coulee City Park during the months of August and September? *People use it an average of 17.7 times.*
3. How many times a week do you launch your boat at the Coulee City Park during the months of August and September: *People launch an average of 16 times.*
4. How many times a week do you and your family use the Coulee City Park for water skiing or other related water sports: *The people use it an average of 13 times.*
5. How many times a week do you and your family go fishing in Bank Lake during the months of August and September: *The people fish an average of 20.4 times.*

Here are a few things that people in the community had to say about Banks Lake:

- It is very important to me and my family for gatherings of old friends and reunions of old classmates.
- Extremely important. We use the lake often, our visitors use the lake and we are having a large family reunion this summer at the City Park.
- Our family uses the lake for recreation just about every day with friends and grandchildren, fishing, swimming, family get-togethers and boating.
- Very important. There isn't much to do around Coulee that the whole family can do together like swimming, boating and fishing. Without use of the lake there would be no way to get in family time.
- The customs have changed since Banks Lake was created. It now is directed towards recreation. Drawing Banks Lake down ten feet would drastically change our customs during the two months.
- The Coulee City Park is where I taught my kids to swim and fish.

- It is very relaxing to go out to the shores of Banks Lake and just have a good time with friends, family, and also to meet new people. Personally, I would rather relax on the shore where the water hits my feet, rather than wading in mud.
- Banks Lake is our place, the "get away" each week during these months. It is our family time on the boat.
- Very. Our small community relies on the lake to bring extra revenue to our community.
- Business in our city depends greatly on the summer tourism with many jobs depending on this. This proposal would only exacerbate an already serious problem for jobs.
- Tourism keeps this town alive in the summer. Without water recreation and fishing on Bank Lake during the warmest summer months, there would be no reason for the tourists to visit our town.
- If they pull the lake down, I will lose about one third of my business at the motel.
- It is a snowball effect: if we lose the business and services in this area, people will leave and not move here. If the population declines, the school enrollment goes down. If enrollment declines, education suffers. It is never ending. If the lake is made unusable (and the drawdown will render it unusable) the economy, education, and way of life will have to change for the worst. If that is the goal of the drawdown, so be it. That is the only effect it will have (not good). Raising the Columbia River water by 1/32 of an inch really does not seem like the right solution for anything.
- This will create an odor problem as well as add to a mosquito population.
- It is a beautiful view from our house. When the lake is lowered, it will become a breeding ground for mosquitoes, which could harbor West Nile virus.
- The environmental impact of a drawdown would be huge. I remember the last drawdown – fish dying in muddy ponds along Highway 155, freshwater clams laying dead on exposed mud flats, muddy water halfway across the lake, and huge dust storms as mud flats dried. It seems crazy to create this kind of a problem for such a minimal potential effect on another.

The Action Alternative will not preserve the Coulee Community customs and culture. First, people in the community use the lake as an important part of their family activities. Making the lake unusable during the warmest and busiest summer days for over a month is contrary to what the people in the county believe in, family. This will negatively impact the custom and culture of families in the community.

Second, the people in Grant County believe in government serving the people as part of their culture. The Action Alternative is contrary to this belief. This will not serve anybody in the community of Coulee City or Grant County and I don't think it will do

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anything for salmon. Just because National Marine Fisheries Service has negatively impacted many communities and because of that they want to negatively impact everyone to spread out the grief in a travesty. This is not government serving the people.

Third, the people of Grant County believe in a strong rural community as part of their culture. The Action Alternative again is contrary to this belief.

Drawing the lake down during the busiest time of the year will have a negative economic impact on this community both long and short term. People that visit will leave and not come back because of the uncertainty. This will cause business to lay off people, other people will leave because of the odor from the mud bogs and, the threat of the West Nile virus. The drawdown will weaken the community.

Fourth, the people of Grant County believe in the preservation of our way of life as part of their culture. The Action Alternative is contrary to their belief. Because the community will lose the use of the lake when it is the most heavily used by the community thereby affecting their way of life.

The people in Grant County value our quality of life as a custom. The Action Alternative will have a negative impact on the quality of life. We also value education as a custom. As stated earlier, as business drops, due to a loss of tourism and recreation, people will leave. School enrollment will drop and the education of the youth in the Coulee Community will decline. We encourage economic development and prosperous communities, cities and towns as our custom and culture. Again, the Action Alternative is contrary to what we encourage as our custom and culture.

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The National Environmental Policy Act (NEPA) not only requires the federal government to consider the impact of its actions on the environment, but also to preserve culture, heritage and custom.

NEPA states:

It is the continuing responsibility of the Federal Government to use all practicable means, consistent with other essential considerations of national policy to:

Preserve important historic, cultural and natural aspects of our national heritage¹.

It is up to the local government to determine the custom and culture of the community.

Grant County has positively identified its custom and culture of the Coulee Community and Grant County. The County is informing the federal agencies of those customs and request/demand that those customs be preserved under NEPA.

Local Economy

Grant County is split up in three (3) economic regions. In all three regions, agriculture is important to the economy.

In the southern region, the towns of Royal City, Warden and Mattawa economy relies heavily on agriculture. The central region, Moses Lake, Ephrata and Quincy are more diversified. They rely on industrial, agriculture and tourists/recreation for their economic base. The northern region, the cities of Soap Lake, Coulee City, Electric City and Grand Coulee, economic base rely heavily on tourists/recreation and less on agriculture.

¹ 16 U.S.C. §4331 (a)(4)

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The drawdown of Banks Lake to the 1,560 foot level will have a major negative economic impact on the northern region of Grant County.

There will be absolutely no net benefit for recreational opportunities at Bank Lake. People come to Banks Lake because of what it offers. If they come and all they see is mud for a swimming beach and the boat launch high and dry, they will leave and not come back. The other lakes in the county are already heavily used, especially the facilities. This not only will have a short term negative impact, but also a long term impact because of uncertainty.

The Grand Coulee, Banks Lake area has continually seen a steady growth in tourism. First it was Grand Coulee Dam, then the laser light show, which brought millions of visitors to the area. Over a period of time, these visitors also discovered the great recreational opportunities to be found in the area. Boating on Banks Lake has become more and more popular every year as long as lake levels remain relatively stable.

Dropping the lake level of Bank Lake below ten (10) feet will have an economic impact on the communities of this area. Coulee City operates a park, swimming beach, boat launch and camping sites. Coulee City, Grant County and the Port of Coulee City have invested nearly \$500,000 in this entire park. In 1994 (Figure 1) Banks Lake was drawn down more than five (5) feet. This drawdown resulting in no water in the swimming area and an unusable boat launch for access to the lake. Loss of revenue alone from the Coulee City Community Park resulted in a five year recuperation from just one year of drawing down Banks Lake.

When Grand Coulee Dam had the fire in the year 2000, the Bureau was unable to pump water into Bank Lake, which in July caused it to drop 7 ½ feet. As soon as word

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got out, Sun Banks Resort began to get cancellations. They had a 21 percent drop in business for August of that year. A ten foot drawdown would make the boat launch totally useless at their resort.

It would also make ingress and egress to and from Osborne Bay, where the boat launch is located, prohibitive. In reality the biggest negative impact that a ten foot drawdown will have on Banks Lake and the tourist trade will be in the image that the tourists have of an empty lake. Sun Banks Resort has already experienced that effect in 2001 by the foolishness of the Seattle and Spokane media creating an image that Lake Roosevelt was in dire straights with little water. Sun Banks Resorts had people calling with the intention of canceling their reservations because of the media showing pictures of the lake with little water.

Fig 1

COULEE CITY COMMUNITY PARK
CAMPING RECEIPTS

	1993	1994	1995	1996	1997	1998	1999	2000
JANUARY								
FEBRUARY								
MARCH								
APRIL	\$ 1,138.00	\$ 2,429.00	\$ 732.00	\$ 527.00	\$ 1,092.00	\$ 3,150.00	\$ 3,157.00	\$3,000.00 Memorial Weekend
MAY	\$ 2,505.00	\$ 10,321.00	\$ 8,568.00	\$ 8,773.00	\$ 11,000.00	10,749.00	9,240.00	\$15,194.00 4845.00
JUNE	\$ 14,773.00	\$ 9,903.00	\$ 7,321.00	\$ 7,012.00	\$ 7,074.00	8,827.00	14,388.00	\$10,597.00
JULY	\$ 12,258.00	\$ 9,901.00	\$ 11,622.00	\$ 12,375.00	\$ 14,386.00	13,421.00	18,065.00	\$20,028.00
AUGUST	\$ 10,942.00	\$ 5,467.00	\$ 11,241.00	\$ 9,388.00	\$ 11,197.00	9,055.00	18,127.00	\$14,088.00
SEPTEMBER	\$ 8,029.00	\$ 4,129.00	\$ 5,497.00	\$ 5,068.00	\$ 5,764.00	5,821.00	8,579.00	\$7,464.00
OCTOBER	\$ 2,153.00	\$ 1,580.00	\$ 2,729.00	\$ 2,213.00	\$ 690.00	2,304.00	2,732.00	\$2,210.00
NOVEMBER	\$ 20.00							
DECEMBER								
TOTAL	\$ 51,818.00	\$ 40,725.00	\$ 47,965.00	\$ 46,354.00	\$ 50,545.00	53,327.00	70,888.00	\$72,569.00

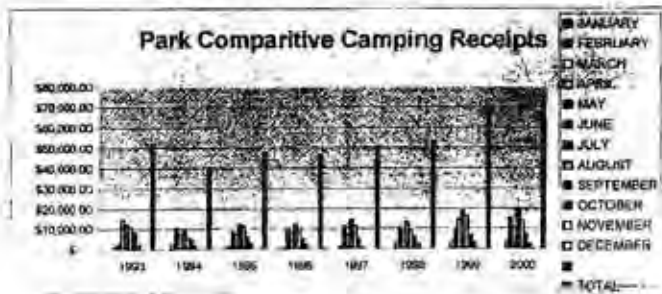


Figure 1

Using OTED statistics County Travel Impacts (Figure 2) destination spending in 1993 was 104.1 million. In 1994 it dropped to 98.6 million. Destination spending did not recover until 1998 level of 1993. This is very similar to the Coulee City Community parks revenue. The northern portion of Grant County is the main attraction for tourism and recreation in the County. Seventy percent of the businesses in the cities Soap Lake, Coulee City, Electric City and Grand Coulee are tourist and recreational based. This is a much higher ratio of tourist related business than any of the other cities in the County.

Grant County is an economically distressed County as designated by the State. Grant County receives sale tax money specifically for investments in infrastructure that creates economic development and jobs for the Cities of Grand Coulee, Electric City and Coulee City, all funds (\$195,000) has gone to tourist related infrastructure. There will be no industrial development in the northern area. The only industry is tourism.

WASHINGTON STATE
County Travel Impact
1991-2001

Prepared:

October 2002



Office of
Trade & Economic
Development

Washington State. Four borders. No boundaries.*

Martha Choe, Director

Figure 2

Page 15 of 93

Washington State Destination Spending by County, 1991-2000

Air transportation not included

(\$Millions)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	*Annual Change
Adams	12.4	13.0	13.2	13.7	13.1	13.7	14.0	14.4	15.0	15.9	3.6
Asotin	13.6	14.1	14.3	16.3	16.9	16.9	17.4	17.4	19.4	21.0	5.0
Benton	87.0	94.2	102.6	125.4	119.6	120.6	129.1	131.3	139.2	154.0	6.5
Chelan	136.3	139.7	143.6	137.3	161.4	160.6	174.0	182.1	203.9	216.0	5.3
Clallam	90.3	98.2	100.4	98.7	104.7	108.1	113.7	116.6	119.8	124.9	3.7
Clark	144.8	151.4	157.6	165.6	177.4	189.9	202.4	223.3	231.3	253.1	6.4
Columbia	3.3	3.4	3.7	4.6	5.0	4.5	4.9	4.8	5.2	5.4	5.8
Cowlitz	71.0	70.6	72.1	72.6	77.8	80.2	86.3	85.9	91.2	93.8	3.1
Douglas	17.5	18.6	18.1	18.2	19.2	19.8	21.0	20.0	21.7	23.9	3.5
Ferry	11.2	11.6	11.4	11.1	12.0	11.8	11.7	11.2	12.5	14.1	2.6
Franklin	48.3	50.6	53.9	56.0	58.4	53.5	59.7	60.8	61.7	66.0	3.5
Garfield	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.5	2.9
Grant	101.9	102.0	104.1	98.6	95.6	98.5	101.2	104.7	110.7	128.9	2.7
Grays Harbor	122.9	129.5	130.7	131.5	140.7	147.7	152.9	167.2	173.6	186.1	4.7
Island	76.1	79.9	83.5	83.8	85.0	88.4	92.0	91.4	97.8	103.8	3.5
Jefferson	56.3	57.3	62.3	60.3	64.2	69.8	67.8	71.5	73.2	77.2	3.6
King	2,063.7	2,125.6	2,186.9	2,316.4	2,524.6	2,770.3	3,015.0	3,179.4	3,454.0	3,744.8	6.8
Kitap	126.9	129.5	127.5	130.1	133.6	141.1	145.4	152.1	160.3	171.6	3.4
Kittitas	52.2	55.0	56.2	57.9	59.3	64.1	64.3	61.8	70.9	74.1	4.0
Klickitat	16.3	16.7	17.4	16.7	18.3	18.0	18.7	19.1	21.2	21.7	3.2
Lewis	87.4	90.4	89.0	87.4	92.2	93.4	99.9	104.2	110.5	121.9	3.8
Lincoln	9.9	10.1	10.2	10.2	9.4	9.5	10.1	10.1	11.1	12.6	2.7
Mason	51.9	53.3	55.0	54.5	56.6	58.0	60.1	59.8	62.9	65.9	2.7
Okanogan	62.9	65.4	67.3	64.0	70.9	71.7	78.7	82.2	90.0	97.3	5.0
Pacific	62.5	66.5	67.3	68.1	71.7	73.7	72.5	80.3	82.6	90.9	4.2
Pend Oreille	15.7	16.2	15.8	15.9	18.3	18.7	18.7	18.4	20.8	22.1	3.8
Pierce	390.3	406.2	418.9	429.0	448.1	469.4	501.2	507.7	539.8	605.6	5.0
San Juan	50.7	58.3	62.4	65.4	75.8	83.6	82.2	91.7	94.5	105.0	8.4
Skagit	113.9	116.5	114.1	118.1	121.3	124.2	136.1	139.2	153.8	168.2	4.4
Skamania	13.6	14.4	14.5	19.2	33.0	33.9	35.9	34.7	37.9	42.9	13.6
Snohomish	333.6	351.2	365.6	370.6	395.3	426.6	462.2	473.5	509.3	571.9	6.1
Spokane	342.0	356.4	362.0	373.8	387.7	412.1	423.8	437.4	456.3	499.3	4.3
Stevens	34.0	34.9	34.5	35.7	36.1	37.1	37.3	36.6	40.5	43.0	2.6
Thurston	104.7	111.8	116.4	125.1	129.9	142.9	145.5	149.5	150.5	176.0	5.9
Wahkiakum	1.5	1.6	1.6	1.7	2.0	2.0	2.1	2.1	2.4	2.5	5.9
Walla Walla	30.9	32.9	32.2	35.0	37.1	37.4	38.3	38.2	40.7	45.1	4.3
Whatcom	221.2	232.0	227.6	227.6	233.0	244.7	259.7	260.3	277.4	302.0	3.5
Whitman	20.6	19.7	21.1	22.3	26.0	27.0	26.8	32.4	29.8	35.6	6.3
Yakima	187.0	174.0	194.1	201.5	204.8	208.7	213.8	214.5	230.4	246.9	3.1
State Total	5,389	5,574	5,752	5,961	6,339	6,759	7,203	7,491	8,033	8,754	5.5

*Annual Change is the average annual percentage change

PAGE 24

Figure 2

DEAN RUNYAN ASSOCIATES

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(I:\Commissioners\OfFields\BOCC\Banks Lake (0310) doc

Visitation to Banks Lake (Figure 3) shows a drop in from 1993 to 1994. Then a rise in 1995 and drop in 1996, same in 1997. When you compare spending with visits, it shows in 1994 a drop in spending and visits that was due to the drawdown. In 1995 there was an increase in visits but even a larger drop in spending. This clearly shows people visited but did not stay and spend money. Because of the uncertainty of the lake level, people made no plans to stay. From 1996 on, visitation dropped and remained steady but spending gradually increased. As with the Coulee City Park revenue, the destination spending both showed it took until 1998 before spending actually caught up to 1993 levels. This clearly shows a drawdown in the month of August for one month will have a long-term negative economic impact to the northern region of Grant County with over 70 percent of the businesses tourist related.

The cities that rely on tourism and recreation, Coulee City, Electric City and Grand Coulee have the least population growth in Grant County (Figure 4) from 1990 – 2000. Tourism and recreation are so important to this region, any negative impacts slows growth as one can see in this area of the County.

In closing the Action Alternative will have a long term economic impact to the region. We can clearly see the impact in 1994 with spending revenues down, taking over five years to reverse. The northern towns majority of businesses are tourist related. The drawdown had an impact on growth as compared to the rest of the cities in Grant County. Grant County will only invest in tourist related infrastructure in the region. Clearly the Bureau of Reclamation MUST NOT select the Action Alternative.

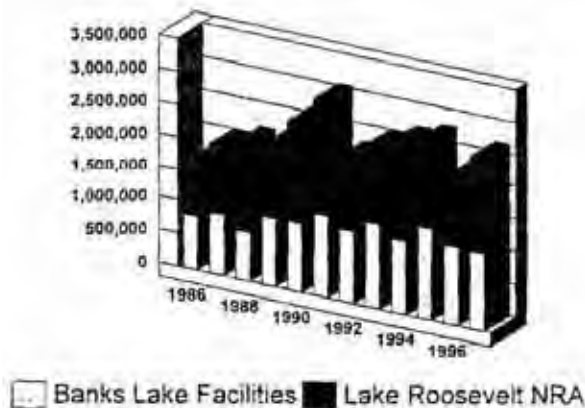
30

Table 2.4
Visitation to Grand Coulee/Banks Lake Area, FY 1997

Facility	Visitors
Grand Coulee Dam Visitor Arrival Center	467,347
Lake Roosevelt National Recreation Area	1,462,820
Steamboat Rock State Park	583,496
Crown Point Vista	45,715
Roosevelt Recreation Enterprises Houseboat Rentals	13,559
Coulee Playland Resort	20,000
Colville Tribal Museum	12,179
GCDAC Chamber of Commerce	13,231
Coulee Dam Visitors Center	7,850
Dry Falls Interpretive Center	17,542
Total	2,643,539

Source: GCDACC, 1998.

Grand Coulee/Banks Lake Visitation 1986-1997



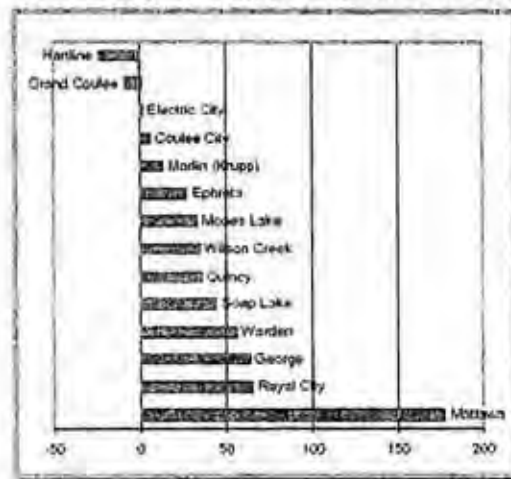
Banks Lake RMP

Chapter 2 - Estimating Resource Conditions

Figure 3

Approximately half, 52%, of Grant County's population lived within an incorporated area in 1990 and 2000. The remainder, 48% of the population lived in an unincorporated area of the county. Mattawa was the fastest growing incorporated area within the county over the 1990-2000 time period. (9)

Graph 4.
Percent Change by Incorporated Area, Grant County 1990-2000



Data Source: Office of General Management, State of Washington

Four incorporated areas of the county increased in total population by 50% or more over the 1990-2000 time period. They were Warden - 55%, George - 63%, Royal City - 65%, and Mattawa - 177%. All of these incorporated areas are located in the southern region of Grant County.

Two incorporated areas, Grand Coulee and Hartline, declined in total population between 1990-2000. Both of these areas are located in northern Grant County.

Data Note 6:
Graph 4 corresponds with data presented in Table 4.

Graph 5.
Location of Incorporated Areas, Grant County 2000

Data Tidbit
The railroad is credited with establishing and changing many towns including local ones like Quincy, Ephrata, Coulee City, and Wilson Creek.



Figure 4

GRANT COUNTY COMPREHENSIVE PLAN

Chapter 4 – Policy Plan

Overview

The Grant County Comprehensive Plan provides a legally recognized framework for making decisions about land use in Grant County. Grant County's comprehensive plan directs the County's future physical growth through several mechanisms. It provides guidance for development regulations, such as the zoning ordinance, and for other county-wide plans such as solid waste, sewer, or capital facilities. Such plans must include the public facilities needed to accommodate the population growth anticipated in the comprehensive plan. They also must ensure that levels of service adopted within the plan can be maintained.

The comprehensive plan will also be useful when reviewing development applications and interlocal agreements or various County programs. Interlocal agreements are voluntary agreements entered into for various purposes, such as to coordinate policies of mutual interest, the use of shared facilities, and the accomplishment of mutual goals. County programs may be developed to fulfill the goals and policies of this Comprehensive Plan.

During the planning effort, scores of people were asked to provide input toward developing goals and policies that will address the many choices the next twenty years will pose, including:

"How should Grant County grow and develop?"

"What services and facilities will be needed to support growth?"

"How will the community pay for public improvements and services needed to support growth?"

"What kind of public/private partnerships and intergovernmental relationships can be forged to meet the challenges of growth?"

Answers to these kinds of questions will shape key public and private sector decisions well into the next century.

Purpose Of Policy Plan

General

This policy plan serves as a framework for County decision-makers, the development industry, and the public covering a broad array of issues of both short- and long-term

importance. The Policy Plan establishes an agenda for future work toward achieving the broader vision for the County. The Policy Plan ensures that Grant County complies with Washington's thirteen planning goals contained in a complex array of statutes and administrative codes known as the Growth Management Act or GMA.

Grant County and its cities and towns are among many jurisdictions required to conduct planning and development decisions according to the GMA. This Policy Plan represents Grant County's means for achieving compliance with the GMA while remaining true to our historical values, customs and culture.

The Plan manages growth by directing urban development to designated areas, including urban growth areas and rural areas of more intensive development, while protecting and conserving natural resource areas and retaining rural landscape features and lifestyles. The plan is also intended to guide planning for a broad range of public and private users, including County officials, community groups, other government agencies and even land developers.

The Plan:

- Guides the development of additional community plans and implementing regulations through its policy statement;
- Guides the provision of public facilities and services by integrating land use, infrastructure, and human service delivery;
- Provides regional coordination and consistency with other jurisdictional planning efforts; and
- Allows for citizen participation and involvement.

Planning Concepts and Principles

Several concepts, and their underlying principles, are basic to the planning approach embodied in this Comprehensive Plan. The Plan has these characteristics:

1. **Long Range.** The Plan is based on a 20-year vision of the County, as defined by the community through an extensive public participation process.
2. **Predictability.** Citizens, interest groups, agencies, and decision-makers planning for the use of land, making financial decisions, or trying to influence the course of a land use decision need to understand the Plan and the standards for its application and review.
3. **Consistency.** The Plan is internally consistent and coordinated with neighboring jurisdictions in an attempt to be externally consistent.

4. **Comprehensiveness.** The Plan interrelates people, land, resources, natural environmental systems, and public facilities in such a way as to protect the future health, safety and welfare of our citizens.
5. **Flexibility.** After its adoption, the Plan will continue to evolve to reflect our actual experience of growth and citizen concerns over that growth. Through annual updates and major, periodic reviews, the Plan will be adjusted to changing needs, unforeseen circumstances, or new local and regional trends.
6. **Goal-oriented.** Goals and policies of the Plan will trace the vision for the future for sustaining and improving the quality of life advocated by our citizens. Goals and policies will also be consistent with and balance the planning goals of the GMA.
7. **Financially Feasible.** The Plan is financially feasible and generally capable of implementation.

Underlying principles include:

1. Population growth should be focused toward urban centers where public services and facilities are present.
2. Future land use within Urban Growth Areas (UGAs) should be designated jointly by the cities and Grant County. Land use planning is a shared responsibility within the unincorporated portions of the UGA, although the County retains land use jurisdiction. The County's objective for land within the UGA should be to manage the transition from rural to urban use, minimizing public costs and uses that could prevent development consistent with the adopted future land use plans.
3. Development choices consistent with rural character should be provided for in rural areas.
4. To protect the long-term viability of the County's agricultural-based economy, residential development unrelated to agriculture should be discouraged on lands designated as agricultural.
5. Implementation of the Plan will be carried out in various ways, including through the goals and policies included in the Plan itself, action items or strategies identified in the Plan, and measures consistent with the Plan goals and policies. Implementation will be guided by the following principles:
 - Reduce the cost of public services by focusing development in areas where services, utilities and access are provided in adequate capacity, or can reasonably be upgraded to provide necessary capacity;

- Maintain flexibility, locational choice and preferences while explicitly specifying service expectations and limitations for each of the development areas;
- Streamline and integrate the regulatory review process for land use decisions to achieve more predictable process and time frames; and
- Emphasize a coordinated partnership approach to funding and providing service and financing development between the public and private sectors as well as across jurisdictional boundaries.

GMA Goals

The GMA requires Washington's fastest growing counties, the cities within them, and other jurisdictions opting in to the process to plan extensively in accordance with the following goals:

- **Urban Growth.** Encourage development in urban growth areas where adequate public facilities and services exist or can be provided in an efficient manner.
- **Sprawl.** Reduce the inappropriate conversion of undeveloped land into sprawling, low-density development.
- **Transportation.** Encourage efficient multi-modal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans.
- **Housing.** Encourage the availability of affordable housing to all economic segments of the population of this state, promote a variety of residential densities and housing types, and encourage preservation of existing housing.
- **Economic Development.** Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, and encourage growth, all within the capacities of the state's natural resources, public services, and public facilities.
- **Property Rights.** Private property shall not be taken for public use without just compensation having been made. The property rights of landowners shall be protected from arbitrary and discriminatory actions.
- **Permits.** Applications for both state and local government permits should be processed in a timely and fair manner to ensure predictability.
- **Natural Resource Industries.** Maintain and enhance natural resource-based industries, including productive timber, agricultural and fisheries industries.

- **Open Space and Recreation.** Encourage the retention of open space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks.
- **Environment.** Protect the environment and enhance the state's high quality of life, including air, water quality, and the availability of water.
- **Citizen Participation and Coordination.** Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to reconcile conflicts.
- **Public Facilities and Services.** Ensure that those public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards.
- **Historic Preservation.** Identify and encourage the preservation of lands, sites, and structures that have historical or archaeological significance.

A Vision For The Future

Visioning Survey

People choose to live and work in Grant County for many reasons. The County provides a diversity of environments and lifestyle choices such as urban, rural, and small town. The wholesome quality of life offered by Grant County includes a clean environment, job opportunities, easy access to work and recreation, quality health facilities, education and cultural activities, a variety of human services and a peaceful, uncrowded atmosphere.

In 1992, Grant County conducted a survey of nearly 2,500 residents to learn about their attitudes regarding a variety of topics related to growth. The results of that survey are summarized below:

Grant County residents:

- Like the rural lifestyle, friendly people and recreational opportunities, and strongly desire to preserve the rural lifestyle;
- Desire to preserve agriculture and agricultural lands;
- Wish there were more job opportunities for their children so that they could stay in the community;
- Wish there were more cultural activities;

- Desire to see economic growth in industry, recreation and tourism, and commercial development;
- Desire to identify and protect environmentally-sensitive areas and wildlife habitat, such as the Columbia, wetlands, Potholes Reservoir, and Moses Lake;
- Believe that land use regulations and permit processing is too cumbersome, and that more enforcement of regulations is needed; and
- Believe that a Comprehensive Plan should be prepared to guide elected and appointed officials toward orderly growth and development.

Visioning Survey Comment

In the Visioning Survey sent out to county residents, like the rural lifestyle, friendly people and recreational opportunities, and strongly desire to preserve the rural lifestyle; wish there were more job opportunities for their children so that they could stay in the community; desire to see economic growth in industry, recreation and tourism, and commercial development. The Action Alternative is contrary with these visions. The drawdown will have a negative impact on the lifestyle of the people in the Coulee Community, also with the desire to see economic growth in recreation and tourism. With the negative impact to the community, the economy will falter, jobs will be lost and the wish for more job opportunities for their children will not happen.

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Vision Statement

Grant County seeks to maintain and enhance its quality of life while achieving benefits of growth and minimizing any negative impacts. Our vision defines our future and how we will respond to growth and change. Our vision is comprised of the following basic values:

- Promote a healthy, diversified, and sustainable local and regional economy by supporting existing local businesses, making prudent infrastructure investments, and encouraging new business that is compatible with and complementary to the community.
- Protect and preserve the natural beauty, rural character, and variety of lifestyles that define our community.
- Protect and conserve our agricultural resources, and prevent inappropriate conversion of prime agricultural lands.

- Manage growth effectively to prevent inappropriate or premature conversion of undeveloped land and to minimize incompatible land uses and the cost of public and private services.
- Encourage infill development within urban growth areas and enhance the sense of "community" around traditional population centers.
- Provide a variety of residential living opportunities, ranging from urban to rural, small town, rural settlement, shoreline, and agricultural.
- Promote healthy, safe, and productive communities with a variety of housing for all economic levels.
- Encourage opportunities for quality community education and technology to meet the educational and training needs of all residents.
- Promote open, responsive and accountable local government that works to create a true sense of community and to create democratic processes on all levels.

Vision Statement Comment

In the Vision Statement, Grant County seeks to maintain and enhance its quality of life while achieving benefits of growth and minimizing any negative impacts by promoting a healthy, diversified, and sustainable local and regional economy by supporting existing local businesses, making prudent infrastructure investments, and encouraging new business that is compatible with and complimentary to the community. Also protect and preserve the natural beauty, rural character, and variety of lifestyles that define our community. The Action Alternative will have negative impact on the local economy; local governments have made large investments in infrastructure. This investment was to promote recreation and tourism, in hopes of creating new business that are compatible with the Coulee Community. The drawdown is contrary to this vision.

Goal LU-5: *The County should conserve or enhance important natural, cultural, and scenic resources.*

Policies

LU-5.1: The Open Space land use designations should:

- Protect streams, stream corridors, wetlands, natural shorelines, and aquifers;
- Protect soil resources;

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- Protect unique, diverse or critical wildlife and native plant habitat;
- Promote conservation principles by example or by offering educational opportunities;
- Enhance the values and functions of parks, wildlife preserves, nature conservancies or sanctuaries, or other open space lands;
- Enhance recreational opportunities and public access to open spaces; and
- Preserve scenic vistas, historic, cultural and archaeological sites.

LU-5.2: The County should inventory open space lands and define those to conserve. The County should consider development of a comprehensive parks, open space and recreation plan to identify, evaluate and designate additional appropriate open space.

Action Alternative Comment

The Action Alternative is in conflict with County Goal LU-5. The drawdown will negatively impact wetlands and the natural shorelines creating large mud flats; negatively impact wildlife and native plant habitat. It will also negatively impact parks and recreational opportunities. Grant County has zoned 95 percent of Bank Lake open space in recognition of the importance of wetlands, natural shorelines, wildlife, parks, recreational opportunities, and public access.

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Economic Development

Goal ED-1: *Encourage diverse employment opportunities that satisfy the socioeconomic needs of Grant County residents.*

Policies

ED-1.1: Facilitate the creation and retention of family wage jobs that meet the needs and demands of Grant County residents.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Streamline zoning, subdivision and other planning and permitting regulations.*

2. *Maintain an operational computerized database (in GIS format) of industrial properties for planning purposes.*
 3. *Expedite planning and permitting actions to take advantage of appropriate industrial development opportunities.*
 4. *Seek high level of cooperation with other local governments and federal and state agencies in areas that affect issues of mutual concern and that could impact continued countywide economic development.*
 5. *Support local economic development agencies and industry groups in market research efforts.*
 6. *Seek ways to enhance utility and transportation infrastructure needed by industry within county.*
 7. *Seek ways to promote flexibility and deregulation of markets for products sold by or used by industries in county.*
- ED-1.2: Encourage business investment as a means to provide job opportunities for Grant County residents.
- Actions:* *The County may consider implementing the following actions under this policy:*
1. *Make necessary public infrastructure investments in transportation, water & sewer, telecommunications, and other utilities to leverage private investments that ultimately create jobs.*
 2. *Provide adequate, serviced and environmentally acceptable sites that would meet the full range of industrial and business needs and opportunities.*
 3. *Identify and organize financial capital resources to assist in attracting new businesses.*
- ED-1.3: Encourage diverse job options and entrepreneurial opportunities for persons interested in full-time or part-time employment or desiring to own their own businesses.
- Actions:* *The County may consider implementing the following actions under this policy:*
1. *Participate in job fairs, information outreach sponsored by local development agencies, job training centers, and industry.*

2. *Encourage entrepreneurship by removing barriers to new business development and promoting efficiency in government.*
 3. *Identify local and non-local financial capital sources to assist new business formation.*
 4. *Establish a mentoring program for first-time entrepreneurs by matching individuals with business ideas with those able and willing to help develop their ideas.*
 5. *Conduct local area studies of market potential for new retail, wholesale, service or industry input-providing businesses to identify opportunities for new local establishments.*
 6. *Assess the feasibility in providing a small business incubator to nurture new local businesses.*
- ED-1.4: Encourage educational opportunities for residents of all ages to develop and upgrade skills required for employment, advancement and entrepreneurship.
- Actions: The County may consider implementing the following actions under this policy:*
1. *Use development funds to provide education infrastructure and training for existing and prospective workers of local industries.*
 2. *Support job training programs and skill enrichment programs.*
 3. *Encourage local school districts to establish entrepreneurial program for students.*
- ED-1.5: Work cooperatively with the Grant County Economic Development Council, Big Bend Community College, and other local jurisdictions to address employment needs consistent with county-wide regional policies.
- ED-1.6: Encourage and accommodate home-based businesses and cottage industries that are consistent with the character of adjoining properties and neighborhoods.
- Actions: The County may consider implementing the following actions under this policy:*
1. *Promulgate special land use classifications and designate areas of the county as needed for small industry neighborhood zoning. This*

would enable for so-called "lone eagles" and cottage-based industries to pursue economic activity.

2. *Support development of telecommunications infrastructure and transportation services (including scheduled air service) required by home-based businesses and cottage industries.*

ED-1.7: Cooperate with education providers and employers in developing facilities and programs meeting a continuum of educational needs at the K-12, college, and continuing education levels.

Goal ED-2: *Encourage economic growth through planning and development of the region's public services and facilities' capacity.*

Policies

ED-2.1: Public service providers in Grant County should provide those services and facilities necessary to support a high quality of life and attract business investment.

ED-2.2: Review land use and permitting procedures to assure that regulatory processes are understandable, predictable, and can be accomplished within reasonable time periods in a manner that meets or exceeds state statutory requirements.

Actions *The County may consider implementing the following actions under this policy:*

1. *Undertake comprehensive utility and other public service planning in order to take advantage of development opportunities, while addressing potential capacity shortfalls in given industrially-zoned locations within the county.*
2. *Provide planning flexibility that will be responsive to unforeseen or changing economic conditions and community desires.*
3. *Encourage long-term programs that effectively build local capacity for sustained economic development.*
4. *Support the development of transportation, and public water, sewer and utility systems that enhance economic growth.*
5. *Seek ways of cooperating with local governments and federal and state agencies to expedite land use and permitting procedures.*

6. *Evaluate issues that impinge upon permitting of natural resources and land uses.*

Goal ED-3: *Ensure an adequate supply of commercial and industrial sites to provide opportunity for new and expanding businesses to locate or remain in Grant County.*

Policies

ED-3.1: Encourage a range of commercial retail and service businesses to meet local resident needs and serve visitors to Grant County.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Encourage convenience-oriented retail within Rural Villages, UGAs, and Rural Communities that are convenient to residential neighborhoods and major employment centers.*
2. *In cooperation with local jurisdictions, identify an inventory of suitable commercial sites adequate to meet anticipated demand during the planning period.*

ED-3.2: Plan for a diversity of ready-to-build sites with sufficient support infrastructure and services needed to meet the demand for industrial land for the duration of the planning period.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Undertake periodic studies of industrial growth in order to set planning targets for industrial sites and adjust long-term forecasts accordingly.*
2. *Undertake evaluations of industrial siting in regard to land use requirements and infrastructure needs.*
3. *Encourage the re-use and redevelopment of existing industrial sites that are no longer viable for their original or previous use.*

ED-3.3: Encourage low-cost, easily accessible, state-of-the-art telecommunications services throughout the County.

Actions: *The County may consider implementing the following actions under this policy:*

1. Undertake evaluations of market conditions, regulatory policies, and franchising requirements pursuant to the permitting and/or licensing of telecommunications services.
2. Encourage development of state-of-the-art cable interties that meet band-width requirements for high-speed signal transmission.

ED-3.4: Facilitate the retention and expansion of existing local businesses and start-up of new businesses particularly those that provide family wage job opportunities and operate in compliance with applicable regulatory requirements.

Actions: The County may consider implementing the following actions under this policy:

1. Undertake prospective (and periodic) analyses of market conditions and land use needs of existing key industries.
2. Establish policies and programs in cooperation with local governments and state agencies to ensure business retention within the county.

ED-3.5: Industrial sites designated under this Plan should be protected from encroaching incompatible uses.

Actions: The County may consider implementing the following actions under this policy:

1. 1. Develop performance and/or site design standards on non-industrial lands adjacent to designated industrial lands.
2. 2. Lands designated as "Heavy Industrial" should be governed by performance standards set forth in the zoning ordinance. Such performance standards should include, but shall not be limited to:
 - Compliance with pertinent regulations regarding discharge of pollutants;
 - A maximum noise level standard;
 - Stream and watercourse protection;
 - Odor, glare, smoke, traffic and other nuisance standards

ED-3.6: Jurisdictions in Grant County shall regularly update inventories of land utilization, land demand, and suitable available properties for residential, industrial, commercial, public facility, and agricultural uses.

Goal ED-4: *Preserve the strength of the existing agricultural industry while diversifying the local economy by strengthening manufacturing and promoting producer services and other basic industries.*

Policies

ED-4.1: Focus business recruitment and development on firms that will diversify the local economy and can effectively serve state, national, Pacific Rim and other global markets from a Grant County location.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Develop target industry profiles and analysis screens.*
2. *Conduct detailed analyses of prospective needs of candidate industries.*
3. *Conduct formal pro forma, market and regulatory analyses, and siting studies as needed.*

ED-4.2: Encourage high value-added resource based products and businesses.

ED-4.3: Encourage the establishment of industrial parks and other light manufacturing facilities and provide zoning of facilities engaged in producer services, including computer, health services, and telecommunications.

Goal ED-5: *Maximize the positive economic impact of tourism and recreational development.*

Policies

ED-5.1: Promote visitor opportunities that are compatible with or complement the character and existing uses of natural resource lands and critical areas or the rural lifestyles of Grant County.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Encourage lodging, retail and transportation services to accommodate enhanced visitor opportunities.*

2. *2. Support efforts to develop, refurbish and maintain scenic open space, cultural and heritage resources that are attractive to both local residents and visitors.*

ED-5.2: Support local jurisdiction efforts to improve and market visitor services.

ED-5.3: Visitor facilities should be sited at locations that can be served with necessary public infrastructure and that are compatible with neighboring uses.

ED-5.4: Provide for siting and development of Master Planned Resorts.

Action Alternative Comment

The Action Alternative will have a direct impact on County Goal ED-5 because of lost boating and swimming opportunities during the busiest time of the year. It is in conflict with policy ED-5.1 because it is contrary to the compatibility character and existing uses of our natural resource land and critical areas and the rural lifestyle of the Coulee Community. It conflicts with ED-5.2 because we lose the effort to improve and market visitor services.

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Goal ED-6: *Improve Grant County's economy by supporting efforts to improve human and social services.*

Policies

ED-6.1: Encourage development of human and social service facilities that create job opportunities, meet community needs, and maintain Grant County's quality of life.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Cooperate with other private and public agencies to promote the establishment of adequate housing and health care to low- and moderate-income workers and their families.*
2. *Expedite permitting of temporary housing, including group quarters.*
3. *Promote alternative financing and development initiatives for permanent housing for low- and moderate-income workers and their families.*

ED-6.2: Support development and maintenance of human and social service facilities including, but not limited to, health care, education, transportation and other services for persons with special needs.

Goal ED-7: *Promote economic growth that conserves natural resources and open spaces, maintains environmental quality and rural character, and enhances the overall quality of life.*

Policies

ED-7.1: Encourage commercial and industrial developments that incorporate innovative and/or experimental applications and demonstrate an ability to conserve natural resources and/or protect or enhance environmental quality.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Establish incentive programs oriented to developments using best-practice technologies (e.g., use of renewable natural resources).*
2. *Establish program that rewards developers through expedited processes and site capacity incentives for siting or relocating facilities to areas that are compatible with surrounding land uses or critical natural resource areas.*

ED-7.2: Long-term commercially significant natural resource lands or lands in urban settlements shall be protected from encroachment from conflicting uses.

Goal ED-8: *Coordinate economic development efforts so that a clear and consistent economic policy is followed.*

Policies

ED-8.1: Work cooperatively with the Grant County Economic Development Council, Big Bend Community College, Port Districts, and other local jurisdictions to address economic development issues and make policies that are consistent with this Plan.

Actions: *The County may consider implementing the following actions under this policy.*

1. *1. Build support for this economic development element by presenting its recommended policies and actions from the County's public and private partners.*

2. 2. Place Grant County Economic Development Council and Grant County Long Range Planning in joint-charge of the implementation of this element.

Critical Areas

Goal NS-2: *Wetlands should be protected because they provide important functions that add to the quality of life.*

Policies

- NS-2.1: Wetland areas should be identified by the development applicant and reviewed by the County prior to development. If a wetland is determined to exist on a parcel subject to a non-exempt development activity, a written delineation should be required of the applicant.
- NS-2.2: The County should consider accepting written determinations, delineations and mitigation plans only from the U.S. Army Corps of Engineers, the Department of Ecology, the Natural Resources Conservation Service, or a qualified critical areas professional. The County should consider requiring that mitigation plans for unavoidable wetland impacts to be based on a wetland functional assessment.
- NS-2.3: Based on their quality demonstrated by the classification system defined in the Resource Lands and Critical Areas Ordinance, wetlands should be protected from alterations due to land use changes that may create adverse impacts to the wetland.
- NS-2.4: The County should consider incorporation of the Washington State Wetlands Rating system for Eastern Washington (Ecology Publication #91-58) into the classifications system adopted in the Resource Lands and Critical Areas Ordinance.
- NS-2.5: The County should consider incorporation of the Washington State Department of Ecology Manual titled "Washington State Wetlands Identification and Delineation Manual, March 1997" into the classifications system adopted in the Resource Lands and Critical Areas Ordinance.
- NS-2.6: Whenever feasible, innovative techniques that enhance a wetland and promote it as a useful, functioning part of the development will be encouraged.
- NS-2.7: Wetland preservation strategies and efforts, including wetland banking, should be coordinated with appropriate local, state and federal agencies

and private conservation organizations to take advantage of both technical and financial assistance and to avoid duplication of efforts.

Action Alternative Comment

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The Action Alternative will be in conflict with County goal NS-2 drawing the lake down for over a month during the hottest time of the year will adversely impact the large wetlands on Banks Lake.

The Action Alternative will be in conflict with Goal NS-6 because of the negative impact to fish and wildlife around and in Banks Lake.

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Protecting Grant County's shoreline environment is of importance to preserving the economic, environmental and cultural resources of the Coulee Community.

Goal NS-6: *Fish and wildlife habitat areas should be protected as an important natural resource, particularly in regard to their functions and economic, aesthetic and quality of life values.*

Policies

- NS-6.1: Critical fish and wildlife habitat conservation areas within the County should be identified as such.
- NS-6.2: The impacts of new development on the quality of land, wildlife and vegetative resources should be considered as part of the environmental review process. Any appropriate mitigating measures should be required. Such mitigation may involve the retention and/or enhancement of habitats.
- NS-6.3: The preservation of blocks of habitat and the connections between them, as well as the restoration of lost and damaged fish habitat, should be encouraged.
- NS-6.4: Proper riparian management that maintains existing riparian habitat and is consistent with best agricultural management practices should be encouraged.
- NS-6.5: Land uses adjacent to naturally occurring water bodies and other fish and wildlife habitat areas should not negatively impact the habitat areas. If a change in land use occurs, adequate buffers should be provided to the habitat areas.
- NS-6.6: Activities allowed in fish and wildlife habitat conservation areas and open space should be consistent with the species located there, and in accordance with all applicable state and federal regulations and/or best management practices for the activity regarding that species.

Shoreline Management

Protecting Grant County's shoreline environment is of importance to preserving the economic, environmental and cultural resources of our community. The shoreline policies that follow have been crafted to recognize these unique and valuable shoreline resources and to protect them for the benefit of future generations. These policies are intended to be consistent with the Shoreline Management Act, Chapter 90.58 RCW.

Goal NS-9: The County should recognize and protect the functions and values of the shoreline environments of statewide and local significance. For shorelines of state-wide significance (SSWS), protection and management priorities are to:

- a. Recognize and protect the state-wide interest over local interest;
- b. Preserve the natural character of the shoreline;
- c. Provide long-term over short-term benefit;
- d. Protect the resources and ecology of shorelines;
- e. Increase public access to publicly owned areas of shorelines; and
- f. Increase recreational opportunities for the public in shoreline areas.

Policies

NS-9.1: General Shoreline Use:

1. Maintain areas within the shoreline jurisdiction with unique attributes for specific long-term uses, including agricultural, commercial, industrial, residential, recreational and open space uses.
2. Ensure that proposed shoreline uses are distributed, located and developed in a manner that will maintain or improve the health, safety and welfare of the public when such uses occupy shoreline areas.
3. Ensure that activities and facilities are located on the shorelines in such a manner as to retain or improve the quality of the environment.
4. Ensure that proposed shoreline uses do not infringe upon the rights of others, upon the rights of private ownership, upon the rights of the public under the Public Trust Doctrine or federal navigational servitude, and treaty rights of Indian tribes.

5. Minimize the adverse impacts of shoreline uses and activities on the environment during all phases of development (e.g. design, construction, management and use).

Shoreline Comment

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Protecting Grant County's shoreline environment is of importance to preserving the economic, environmental and cultural resources of the Coulee Community. The Action Alternative will be in conflict with the County's goal NS-9. Banks Lake is a lake of state-wide significance, along with the shoreline. The drawdown will be in conflict with A through F of the State and County's priorities in protection and management of our shoreline.

The Action Alternative will be contrary to the County's policies of shoreline management NS-9.2 Economic Development, NS-9.5 Public Access, NS-9.6 Recreation Development, NS-9.5 Public Access, NS-9.5 Recreation, NO-9.8 Wetlands, NS-9.15 Natural Environment, NS-9.18 Boating, NS-9.19 Commercial Development and NS-9.23 Recreational Development. The drawdown will have a negative impact on economic development, reduce public access, damage recreation, adversely impact wetlands, degrade the natural environment, limit boating, negatively impact commercial development and damage long-term recreation development because of uncertainty, unpredictability and consistency with the lake level.

NS-9.2: Economic Development:

1. Ensure healthy, orderly economic growth by allowing those economic activities which will be an asset to the local economy, and for which the adverse effects on the quality of the shoreline and surrounding environment can be mitigated.
2. Protect current economic activity (e.g. shipping, marinas, agriculture, etc.) that is consistent with the policies of the SMP.
3. Develop, as an economic asset, the recreation industry along shorelines in a manner that will enhance public enjoyment.
4. Ensure that any economic activity taking place along the shorelines operates without causing irreparable harm to the quality of the site's environment or adjacent shorelands.
5. Protect current agricultural land uses of long-term commercial significance and provide for development of new agricultural uses for which adverse environmental effects can be mitigated.

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NS-9.3: *Circulation:*

1. Provide safe, reasonable, and adequate circulation systems to shorelines where routes will minimize adverse effects on unique or fragile shoreline features and existing ecological systems, while contributing to the functional and visual enhancement of the shoreline.
2. Within the shoreline jurisdiction, locate land circulation systems that are not shoreline dependent as far from the land-water interface as practicable to reduce interference with either natural shoreline resources or other appropriate shoreline uses.

NS-9.4: *Conservation:*

1. Develop and implement management practices that will ensure a sustained yield of renewable resources of the shorelines while preserving, protecting, enhancing and restoring unique and nonrenewable shoreline resources, environments, or features.
2. Reclaim and restore areas that are biologically and aesthetically degraded to the greatest extent feasible.
3. Preserve scenic vistas, aesthetics, and vital estuarine areas for fisheries and wildlife protection.

NS-9.5: *Public Access:*

1. Ensure that developments, uses, and activities on or near the shoreline do not impair or detract from the public's access to the water. Where practicable, public access to the shoreline should be enhanced.
2. Design public access projects such that they provide for public safety and minimize potential impacts to private property and individual privacy.

NS-9.6: *Recreation:*

1. Optimize recreational opportunities now and in the future in shoreline areas.
2. Encourage federal, state and local governments to acquire additional shoreline properties in Grant County for public recreational uses.

NS-9.7: Historic/Cultural/Scientific:

1. Identify, protect, preserve, and restore important archeological, historical, and cultural sites located in shorelands.
2. Encourage educational projects and programs that foster a greater appreciation of the importance of shoreline management, maritime activities, environmental conservation, and maritime history.
3. Prevent public or private uses and activities from destroying or damaging any site having historic, cultural, scientific or educational value without appropriate analysis and mitigation.

NS-9.8: Wetlands:

1. Preserve and protect natural (non-exempt) wetlands to prevent their loss and degradation.
2. Identify natural (non-exempt) wetlands areas and boundaries according to established identification and delineation procedures.
3. Provide adequate mitigation for disturbance of natural (non-exempt) wetlands and buffers in the shoreline environment.
4. Maintain a wetland buffer zone of adequate width between a natural (non-exempt) wetland and adjacent development to protect the functions and values of the wetland.
5. Base the width of the established buffer zone upon the functions and values of the natural (non-exempt) wetlands.
6. Natural (non-exempt) wetlands that are impacted by activities of a temporary nature should be restored upon project completion.
7. Give preference to in-kind and on-site replacement of wetland functions and values. Where in-kind and/or on-site replacement is not feasible or practical due to the characteristics of the existing wetland or property, mitigation of equal or greater ecological value should be provided off site.
8. Require an applicant to monitor mitigation plans, and to take corrective action if necessary, in order to ensure long-term success of mitigation projects.

9. Develop standards and procedures for wetland banking allowing for approval of wetland mitigation banks on a case by case basis until such standards and procedures are adopted.

NS-9.9: Utilities:

1. Require utilities to utilize existing transportation and utility sites, rights-of-way and corridors whenever practicable, rather than creating new corridors in the shoreline environment. Joint use of rights-of-way and corridors in shoreline areas should be encouraged.
2. Locate utility facilities and corridors so as to protect scenic views. Whenever practicable, such facilities should be placed underground or alongside or under bridges.
3. Design utility facilities and rights-of-way to preserve the natural landscape and to minimize conflicts with present and planned land uses.
4. Prohibit solid waste disposal activities and facilities in certain sensitive shoreline areas.
5. Ensure that utilities that are necessary to serve shoreline uses are properly installed so as to protect the shoreline environment and water from contamination.
6. Locate and design utility facilities in a manner that preserves the natural landscape and shoreline ecology, and minimizes conflicts with present and planned land uses.
7. Locate utility features for adequate setback at river crossings so as to allow for natural river meander.

NS-9.10: Vegetation Management:

1. Stress prevention of aquatic weed problems. Where active removal or destruction is necessary, it should be the minimum necessary to allow water-dependent activities to continue. Control activities should minimize negative impacts to native plant communities, and include appropriate disposal of weed materials.
2. Invasive, noxious weeds causing irreparable damage to the shoreline environment should be removed with all due diligence.

NS-9.11: Water Quality:

1. Require developers to locate, design, construct, and maintain shoreline uses and activities to minimize adverse impacts to water quality and fish and wildlife resources.
2. Minimize or mitigate for impacts from agricultural activities such as animal feeding operations, feed lot wastes, retention and storage ponds, manure storage, use of fertilizers and pesticides and other like activities by implementing best management practices.

NS-9.12: Urban Environment:

1. Prioritize the preservation or expansion of existing high-intensity commercial or industrial waterfront centers over the creation of new high intensity industrial or commercial sites.
2. Site industrial or urban development in areas without severe biophysical limitations.
3. Prioritize "water-dependent", "water-related" and "water-enjoyment" uses over other waterfront uses.
4. Ensure that developments within the Urban environment are compatible with uses and activities in adjacent (including aquatic) environments.

NS-9.13: Rural Environment:

1. Protect areas with a high capacity of supporting agricultural or forestry uses from incompatible development.
2. Encourage public and private recreational facilities that are compatible with agriculture and forestry industry.
3. Discourage urban density development.
4. Promote low-density residential development.
5. Allow mineral extraction with sufficient buffers.
6. Require development within the Rural environment to be compatible with uses and activities in adjacent (including aquatic) environments.

NS-9.14: Conservancy Environment:

1. Prohibit or restrict activities and uses that would substantially degrade or permanently deplete the physical or biological resources of the area.
2. Restrict new development to that which is compatible with the natural or biological limitations of the land and water.
3. Prohibit activities or uses that would strip the shoreline of vegetative cover, cause substantial erosion or sedimentation, or adversely affect wildlife or aquatic life.
4. Encourage agricultural and recreational activities that will not be detrimental to the natural shoreline character.
5. Allow single family residential development as a principal use in the Conservancy environment.
6. Ensure that developments within the conservancy environment are compatible with uses and activities in adjacent (including aquatic) environments.

NS-9.15: Natural Environment:

1. Restrict or prohibit uses or developments that would significantly degrade the natural value or alter the natural character of the shoreline area.
2. Permit access for scientific, historical, educational and low-intensity recreational purposes, provided that no significant adverse impact on the area will result.
3. Ensure that uses and activities permitted in locations adjacent to shorelines designated Natural are compatible and will not compromise the integrity of the natural environment.
4. Ensure that developments within the Natural environment are compatible with uses and activities in adjacent (including aquatic) environments.
5. Prohibit commercial and industrial uses other than low-intensity agricultural practices, low-intensity mineral extraction, and commercial forestry.
6. Prioritize preservation of resources over public access, recreation and development whenever a conflict exists.

NS-9.16: Aquatic Environment:

1. Prohibit structures that are not water-dependent and uses that will substantially degrade the existing character of the area.
2. Ensure that developments within the aquatic environment are compatible with the adjoining upland environment.
3. Encourage diverse public access opportunities to water bodies that are compatible with the existing shoreline environment.

NS-9.17: Agriculture:

1. Protect agricultural land of long-term commercial significance from incompatible and preemptive patterns of development.
2. Protect the productivity of the land base by using best management practices to control soil erosion.
3. Maintain a vegetative buffer between agricultural lands and water bodies or wetlands.

NS-9.18: Boating:

1. Locate and design boating facilities so that their structures and operations will be compatible with the area affected.
2. Discourage the use of floating homes and houseboats. They should be allowed only in limited circumstances where their negative environmental impacts can be substantially avoided.

NS-9.19: Commercial Development:

1. Encourage new commercial development on shorelines to locate in those areas with existing, consistent commercial and/or industrial uses and in a manner that will minimize sprawl and the inefficient use of shoreline areas.
2. Encourage commercial development to utilize existing transportation corridors and to minimize the number of ingress/egress points. Ingress/egress should be designed to minimize potential conflicts with, and impact on, regular corridor traffic.

NS-9.20: Flood Hazard:

1. Restrict or prohibit development uses in flood plains that will be dangerous to health, safety or property during flood events.
2. Require enhanced construction standards in areas that are vulnerable to flooding.

NS-9.21 *Industrial:*

1. Restrict new industrial lands from being sited on sensitive and ecologically valuable shorelines.
2. Encourage new industrial development to provide physical and/or visual access to shorelines.
3. Encourage Industrial and Commercial Development within incorporated Urban Growth Areas, Rural Areas of More Intense Development, Major Industrial Developments, lands designated as Commercial and Industrial, and on existing Port-owned and/or operated parcels.

NS-9.22: *Mining:*

1. Protect water bodies from sources of pollution, including but not limited to, sedimentation and siltation, chemical and petrochemical use, and spillage and storage/disposal of mining wastes and spoils.
2. Minimize the disruption caused by mining activities so that the natural shoreline systems can function.
3. Minimize adverse visual and noise impacts of mining on surrounding shoreline areas.
4. Return closed mining sites to as near a natural state as feasible upon closure.

NS-9.23: *Recreational Development:*

1. Locate and design shoreline recreational developments to reflect population characteristics, density and special activity demands.
2. Design recreational developments to minimize adverse impacts on the environment.
3. Encourage a variety of compatible recreational experiences and activities to satisfy diverse recreational needs.

4. Encourage the linkage of shoreline parks, recreation areas, and public access points with linear systems, such as hiking paths, bicycle paths, easements and/or scenic drives.
5. Locate and design recreational developments to preserve, enhance, or create scenic views and vistas.
6. Locate, design and maintain trails and pathways to protect bank stability.

Chapter 6 – Economic Development Element

Introduction

Purpose of the Chapter

A healthy economy is essential to the vitality and quality of life in Grant County. While the natural setting of the County largely determines the parameters within which economic development may occur, virtually every other feature of community life is dependent on the area's economy.

This Element places economic development within the context of the County's other goals and policies. To be able to provide adequate employment opportunities for the projected population growth during the planning period, the economy must grow. Growth, however, is subject to the constraints of the natural setting and the vision of our citizens. Gaining consensus for the direction economic development should take enhances economic development efforts.

Economic growth also requires investment in the infrastructure of the County, including transportation facilities, water and sewer systems, and private utilities. Having industrial and commercial sites available, ready-to-develop at an affordable price is a prerequisite to effectively participating in the competition of new companies. Changes in the economic development of the County also may impact its demographic composition and affect both the type and location of needed housing. Because economic development can have system-wide impacts, proposed economic policies must be addressed. Those policies or activities that are not sustainable within the constraints of the County do not contribute to the overall well-being of the County.

This Element is related to many other elements of this Plan. The Natural Setting, Land Use, Capital Facilities, Utilities, and Housing Elements describe plans and policies for infrastructure development and land use. These elements lay the groundwork and form the "building blocks" for economic development.

Grant County's Vision for the 21st Century

Grant County seeks to maintain and enhance its quality of life while achieving benefits of growth and minimizing any negative effects. Our vision defines our future and how we will respond to growth and change. Our vision centers on the following basic economic value:

"Promote a healthy, diversified and sustainable local and regional economy by supporting existing local businesses, making prudent infrastructure investments, and encouraging new business that is compatible with and complementary to the community."

Overview

Grant County is part of what many have called the "other Washington," composed of a struggling rural economy outside of the dynamic, healthy urban economy found in many Washington metropolitan areas. In recent decades, employment growth has faltered in resource-based industries, such as farming and forest products, which has provided the economic foundations for many of these rural areas in the state. Of particular concern is a group of rural counties, many of whom have not shared in the state's recent economic prosperity. With double-digit unemployment rates, depressed per capita incomes, and low rates of employment growth, these "distressed" counties indicate they have been left behind economically.

Although Grant County has been designated as a "distressed" county, some aspects of the county's economy stand in sharp contrast to a number of other counties that comprise the "other Washington." While high unemployment rates continue to persist, Grant County is among the state's leading counties in population growth and employment gains during the 1990s.

Grant County's vision for its economic future focuses on such key words/phrases as vitality, diversity, quality-of-life, sustainability and growth. As Grant County moves into the twenty-first century, it has the opportunity to excel and enjoy the benefits of balanced economic growth without compromising its quality-of-life. Effective local economic development planning and well-informed decision-making and action are needed to achieve these goals.

Overview Comment

The Action Alternative again is in conflict with the state's goal to promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons. The US Census Bureau shows the Coulee Community with families below the poverty level for higher than the state. The drawdown will cause a drop in tourism, which in turn will cause an economic downturn in their economy, impacting an already disadvantaged community

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Economic Development Comment

The Economic Development element of the County's comprehensive plan for the vision for the 21st century is in conflict with the Action Alternative. The city, County, and port have invested in infrastructure to promote recreation and tourism, to encourage new business is compatible with and complimentary to the community. Drawing the lake down during the busiest time of the year leaving no swimming beach or boating facilities will severely impact that vision. This will adversely impact a healthy, sustainable local economy, limiting infrastructure, investment and discouraging new business.

Relationship To Other Plans

Growth Management Act Requirements

The Growth Management Act (GMA) essentially creates a framework to plan for economic development through the Act's thirteen goals, requirements for countywide planning policies, mandatory plan elements, and other planning requirements. Economic development is one of these core goals of the Act. Furthermore, integration of economic development into this GMA framework helps to ensure that policies, regulations, and procedures produced are consistent with the broad community vision, reflect the preferred local economic strategies, and support sustainable and vital local economies.

Operationally, the GMA states this economic development goal is to:

Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, and encourage growth, all within the capacities of the state's natural resources, public facilities, and public services.

GMA recognizes that economic development planning no longer stands alone as an isolated activity, but is an integral part of comprehensive planning and community development. Furthermore, economic development has evolved from its perceived singular focus on commercial and industrial development to a broader emphasis on the role the economy plays in implementing the county's vision. Not only does the local economy provide jobs and income for its residents; it creates the tax base to support education, public safety, infrastructure, environmental management, and other public services and programs.

County-Wide Economic Development Planning

Although this effort represents the first county-wide economic development plan, various Grant County entities have been engaged in economic development planning activities. In October 1997, Grant County Economic Development Council (EDC) developed a

consensus mission statement for Grant County. This mission statement also included the stated goals and priorities of the EDC. The mission statement of the Grant County Economic Development Council is:

To work for the continued, orderly growth of the Grant County economy through coordinated marketing and planning activities while maintaining a favorable quality of life for its residents.

The stated goals and priorities of the Grant County EDC are:

- To promote and attract new business to Grant County;
- To assist retention and expansion of existing business;
- To serve as a facilitator for public forums on vital issues affecting economic growth in Grant County; and
- To increase the coordination of, and support for, community and economic development services in Grant County.

In many ways, the stated mission and goals of the Grant County EDC is similar to the articulated vision of the residents of Grant County.

Objectives of Economic Development Policies

Economic development planning is difficult, complicated by interrelationships among markets and between markets and policies in the real world. In addition, the context of economic development planning is important—planning within rural areas is vastly different from planning in metropolitan areas. Complications begin with definitions: what is economic development? How does it differ from economic growth?

Although economic development has been defined differently over the years, it has become increasingly synonymous with “jobs,” signaling various economic and social issues. In practice, economic development is essentially the process by which individuals and organizations make decisions to invest in an area. Through innovations and adaptations, these investors increase their capacity to create wealth. The results are new, expanded, or retained, industrial, commercial, or service enterprises and new or retained jobs.

Local economic development is a process requiring both the efforts of private and public sectors to achieve its potential. While the basic elements of economic development—such as availability of labor, capital, appropriate technology, infrastructure, and support services—are the same regardless of the area, the basic characteristics of rural and urban areas differ. Several important variations influence what development strategy is adopted and the nature of effective public-private partnerships.

- First, the growth or decline of business and population has a greater relative impact in smaller, rural areas. For example, the expansion of a manufacturing industry leading to the addition of 100 new jobs would have little impact on day-to-day service demands in a metropolitan area. Such an investment, however, would add several percentage points to the employed workforce and associated population within a rural area. The resulting growth could strain the ability of the town to provide utility hook-ups, fire protection, and other community services. Conversely, the loss of a 100-employee plant has a much more severe impact on the economic well-being of a rural area than a metropolitan city. The job losses may result in outmigration, a lower tax base, underutilized public facilities, and municipal fiscal deficits.
- Second, many rural areas are dominated by one or two industries, whether agriculture, forestry, mining, or manufacturing. Such dependence makes them especially vulnerable to downturns caused by factors ranging from changing global markets to bad weather. Unlike their metropolitan counterparts, rural areas often do not have the breadth in their economic bases to help cushion the effect of problems confronting specific industries. Consequently, development policies aimed at technological modernization and competitiveness often take on greater importance in rural areas.
- Third, the smaller and less dense population base in rural areas make delivery of basic services more difficult. The logistics and mechanisms for providing public services in urban areas produce economies of scale impossible for rural areas to duplicate.
- Fourth, rural areas often lack the capacity—enough trained staff, locally generated development capital and technical resources, and sufficient access to outside resources—to take advantage of public assistance programs and private development opportunities. Indeed, the need to build local capacity is the most pressing development issue for many rural areas.

Economic development is fundamentally linked with economic welfare and social well-being or quality of life, both now and in the future. Indeed, this linkage between economic welfare or quality of life and economic development policies has become so important; it has been called the “second paycheck.” An area’s net quality of life benefits are analogous to a second paycheck that each resident of the region receives, supplementing the first paycheck received from an employer or other source of income. Some economists argue that the sum of these two “paychecks” determines the overall well-being of the area’s residents.

In contrast to economic development, economic growth is more a quantitative measure—more investment, income, jobs, output, and consumption—within the local economy. Economic growth essentially means more economic activity, and generally results from economic development.

When government pursues economic development and achieves economic growth, there will likely be debate about the merits of that growth. On the positive side are the benefits to the local area including increased jobs and income, growth of services, and developed space; on the negative side are the inconveniences that accompany growth such as congestion, pollution, and the loss of open space.

Most citizens recognize the inherent tradeoffs—some favor growth while others fear the negatives. The diversity of interests requires government to pursue a broad range of objectives, many of which may conflict. The challenge for governments undertaking economic development is to recognize these potential conflicts and make sound decisions about the inherent conflicts among various objectives.

Public policy should not try to maximize a single objective because the result would most certainly be a reduction in the overall welfare of the local area. For instance, maximizing employment or income might result in severe reductions in local environmental quality. Conversely, maximizing environmental quality might mean stopping most development. Instead, the public sector should pursue an overall strategy that optimizes multiple objectives.

Even if government could maximize economic outcomes in the aggregate (i.e., Grant County taken as a whole), many decisions turn on what happens at the disaggregated level (impacts on specific industries, locations, or groups). Economists see this distinction as essentially a tradeoff between efficiency and equity: policies that may generate the most benefits in the aggregate may in turn distribute those benefits and costs so poorly that they will be rejected by citizens and policymakers. Other policy issues abound. For instance, who should County economic development programs be assisting—businesses or workers, existing firms or new firms? Where should jobs and employees be located?

Residents in Grant County would agree that the outcome of economic development planning should be to make them better off. Unfortunately, there is no practical way to maximize a single objective at the exclusion of others. Thus, government needs to be recognize that: (1) they will pursue multiple economic development objectives; and (2) they must have the public support for these objectives.

Planning processes in economic development spend a great deal of time at the front end discussing and debating broad goals and objectives to achieve this level of support. The citizen's advisory committee did not spend much time on this discussion since the framework had already been adopted through the 1997 mission statement of the Grant County Economic Development Council.

Economic Development Comment

In the objective of Economic Development policies, first the growth or decline of business and population has a greater relative impact in smaller, rural areas. Second, many rural areas are dominated by one or two industries, to tourism and agriculture in the Coulee Community, such

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dependence makes them especially vulnerable to downturns. Third, the smaller and less dense population base in rural areas make delivery of basic services more difficult.

Economic development is fundamentally linked with economic welfare and social well-being or quality of life, both now and in the future. This linkage between economic welfare or quality of life and economic development policies has become so important; it has been called the "second paycheck."

The Action Alternative is contrary to our objectives of economic development. The decline of business and population due to the lack of facilities during the busiest time of the year, causing a drop in visitors, will have a greater negative impact because this is a small rural area.

The Coulee Community relies on tourism and agriculture as its economic base. Because the community relies heavily on tourism, the Action Alternative will make them very vulnerable to a downturn. Because economic development is lumped with economic welfare and social well-being or quality of life, the Action Alternative will have a negative affect on the quality of life for the Coulee Community.

Needs Assessment

This section presents five realistic economic development options for Grant County based on the County economic SWOT assessment and discussion with county officials and civic leaders. These options will help serve as guides for the county to develop and implement a formal economic development action plan.

Option 1: Attract New Employers

Attracting new basic employers for whom there is a comparative advantage to the county will add employment and income directly. Through the economic multiplier effect, other jobs and income will also be added within the county. Basic employers can include (a) manufacturing; (b) nonmanufacturing, such as tourist attractions, computer services, and wholesale warehouses; or (c) non-local government. Action steps/policies to meet this goal include:

- Identification through targeted research of basic employer(s) with greatest potential;
- Encourage value-added agricultural production and processing;
- Provision of adequate, serviced and environmentally acceptable sites that would meet the full range of industrial/business needs and opportunities;

- Make the necessary infrastructure investments in transportation, water and sewer, telecommunications, and other utilities as needed to leverage private investments that create jobs; and
- Identification and organization of financial capital resources to assist in attracting new business (e.g., industrial revenue bonds, infrastructure grant/loan).

Option 2: Cultivate Home-grown Businesses

Once overlooked, small cities and rural counties are now discovering that a strong home-grown business development strategy can often become their most powerful business attraction strategy. For many smaller communities and rural areas, a more appropriate and realistic approach may be to grow their own industries job by job than to recruit outside industry.

Every community and area has the opportunity to develop home grown businesses. Most of these businesses have modest beginnings. They start small and keep overhead to a minimum and remain flexible. Keeping costs low, these local entrepreneurs can compete effectively with larger, more established competitors. As they gain experience and market visibility, many expand and hire employees. For local economic developers, the bottom line is growth job by job.

Historically, little has been done to take advantage of this opportunity. However, there is much an area or community can do to cultivate and nourish home grown businesses:

- For many areas and communities, a realistic starting point is to identify individuals living in the vicinity who have either recently started a business or have a business idea that they would like to develop. This may include an established business with an interest in developing a new product or business line. First-time entrepreneurs seldom have much knowledge of business management, marketing, business plans, and applicable government regulations. A valuable local area role is establishing a mentoring program—simply matching individuals with business ideas to those able to help develop their ideas. Another possible avenue is to encourage the local high school to establish an entrepreneurship program for students.
- Local area studies of market potential for new retail, wholesale, service, or industry input-providing businesses may identify opportunities for new local establishments.
- Organization of local area capital resources to assist new business formation by encouragement of investment of private funds locally through the formation of capital groups, or the use of secondary capital markets.

- Provision of small business incubators to nurture new local businesses. Typically, these incubators are community- or port-owned facilities that provide low-cost space and technical assistance to help local entrepreneurs turn a hobby into a full-time business and successful component of the local business community.
- Related to the business incubator concept, Grant County (or Big Bend Community College) should assess the prospects of developing a telecenter. Among the fastest growing occupations into the next century will be within information-based businesses such as data processing, legal research, computer-assisted engineering design, and accounting. A telecenter is similar in concept to a business incubator. Both provide the necessary support for start-up businesses. Telecenters, however, specialize in information-based jobs that can be performed using computers and telecommunication technologies. Individual businesses in Moses Lake, for example, could provide data processing services for large companies located in Olympia, Tacoma, Portland, and Seattle.

Option 3: Diversify the Existing Economic Base

The economy of Grant County has been dependent upon the natural resource-based industries of agriculture production and processing. Agriculture, however diverse, can be seriously affected by market conditions. Much can be done to assist these basic firms; by increasing their competitiveness, the greater likelihood that firms will be retained or expanded within the local area. Action steps/policies recommended include:

- Strengthen the management capacities of existing growers and processors through educational programs;
- Encourage business growth through the identification of equity and loan capital sources;
- Increase knowledge of new technology through educational programs in agricultural science and engineering;
- Assist employers in improving workforce quality through vocational and technical education, employment counseling, and supportive social services;
- Develop local infrastructure and technical expertise that improve local business efficiency and access to nonlocal markets; and
- Sponsor business and industry recognition or appreciation events. Although such events do little per se to increase their competitiveness, they are effective stimulants in encouraging business leaders to stay within the local area and to expand.

Option 4: *Promote Grant County as a Destination for Tourists*

Tourism in the United States has expanded steadily during the past 30 years. Driving factors of tourism are more people with greater leisure time and higher income levels. Tourism has become an important economic opportunity for small towns and rural areas that are able to offer travelers a unique experience. Rural tourism can range from bed and breakfast inns to farm vacations to harvest festivals. A common thread to most successful rural tourism efforts is the promotion of rural qualities and natural resources of small town USA. For instance, many rural areas exploit their natural resource heritage or early settlers' ancestry with interpretive centers.

Thousands of vehicles pass through Grant County on U.S. Interstate-90 and U.S. Route 2 each day. Thousands more traverse the county on state routes. The Washington State Department of Community, Trade & Economic Development estimates that visitors and tourists spend over \$104 million each year in Grant County. Grant County has yet to tap its enormous tourism potential by capturing dollars spent by area travelers and bringing additional tourists to the area.

Needs Assessment Comment

Grant County's needs assessment developed options that will help serve as guides for the County to develop and implement a formal economic action plan. One option is to promote Grant County as a destination for tourists. It is estimated that visitors and tourists spend over \$104 million each year in Grant County. Grant County has yet to tap its enormous tourism potential by capturing dollars spent by area travelers and bringing additional tourists to the area. The Action Alternative will have the opposite effect. When tourists come to Coulee City and see a muddy beach and a boat launch high and dry, they will leave and not come back. This will not attract additional tourists.

Option 5: *Keep Shopping Dollars at Home Where They Are Needed*

A serious problem facing many rural areas like Grant County is an increasing tendency by local residents to travel to larger cities for shopping. Residents shopping outside Grant County results in lost business for local merchants. Can Grant County merchants regain some of these shopping dollars lost to surrounding regional shopping areas? It may be possible for Grant County retailers to regain a significant share of its local market within five years.

Rural areas and small communities across the nation have successfully implemented a four-point retailing program to bring shoppers back to the local community. These four points are:

- **Organization.** Early and active participation by merchants, residents, and local government is essential for success in recapturing lost retail sales. Strong organization is the key to achieving the necessary community involvement.
- **Appearance.** Cleanliness of streets and sidewalks, attractive stores and buildings, interesting window displays, simple but effective in-store merchandising are some elements of community efforts to encourage local shopping.
- **Promotion.** Shopping locally is partly out of habit. Local businesses must encourage people to patronize their stores by offering special promotions, friendly service, supporting local events, and investing in regular advertisements. These efforts help people develop the habit of shopping locally.
- **Business development.** One of the major reasons why businesses fail is that the needs of their customers' change but the businesses don't. To bring shoppers back, each business needs to make a realistic appraisal of their business. Often by changing long established merchandise lines, improving store appearances, and bettering service, new life can be restored to declining retail businesses.

This approach is a not only a prescription for new economic health for local retailers; it may have broader economic development implications. For instance, these requisite steps in bringing back local shoppers are also needed to attracting tourists and visitors to the community. And recruiting a major new employer to the area may be unsuccessful unless steps are taken to promote more local shopping.

Goals & Policies

Goals and policies follow the shared vision for the future of Grant County for sustaining and improving our quality of life. Goals and policies are also consistent with the Planning Goals of the Growth Management Act. Goals are broad statements of a community's aspirations. Policies express a commitment to a course of action. Policies provide overall direction for implementation of a strategy. Policies provide clear guidance for decision-making subject to this Plan, and form the basis for development regulations. Goals and policies do not apply to incorporated cities, but rather, only to unincorporated areas of the County, including the unincorporated portions of UGAs.

Following are the goals and policies of the Comprehensive Plan related to Economic Development. Included are recommended action steps to pursue each of these economic development goals.

Goal ED-1: Encourage diverse employment opportunities that satisfy the socioeconomic needs of Grant County residents.

Policies

ED-1.1: Facilitate the creation and retention of family wage jobs that meet the needs and demands of Grant County residents.

Actions: The County may consider implementing the following actions under this policy:

1. Streamline zoning, subdivision and other planning and permitting regulations.
2. Maintain an operational computerized database (in GIS format) of industrial properties for planning purposes.
3. Expedite planning and permitting actions to take advantage of appropriate industrial development opportunities.
4. Seek high level of cooperation with other local governments and federal and state agencies in areas that affect issues of mutual concern and that could impact continued countywide economic development.
5. Support local economic development agencies and industry groups in market research efforts.
6. Seek ways to enhance utility and transportation infrastructure needed by industry within county.
7. Seek ways to promote flexibility and deregulation of markets for products sold by or used by industries in county.

ED-1.2: Encourage business investment as a means to provide job opportunities for Grant County residents.

Actions: The County may consider implementing the following actions under this policy:

1. Make necessary public infrastructure investments in transportation, water & sewer, telecommunications, and other utilities to leverage private investments that ultimately create jobs.
2. Provide adequate, serviced and environmentally acceptable sites that would meet the full range of industrial and business needs and opportunities.

3. *Identify and organize financial capital resources to assist in attracting new businesses.*
- ED-1.3: Encourage diverse job options and entrepreneurial opportunities for persons interested in full-time or part-time employment or desiring to own their own businesses.
- Actions:* *The County may consider implementing the following actions under this policy:*
- a) *Participate in job fairs, information outreach sponsored by local development agencies, job training centers, and industry.*
 - b) *Encourage entrepreneurship by removing barriers to new business development and promoting efficiency in government.*
 - c) *Identify local and non-local financial capital sources to assist new business formation.*
 - d) *Establish a mentoring program for first-time entrepreneurs by matching individuals with business ideas with those able and willing to help develop their ideas.*
 - e) *Conduct local area studies of market potential for new retail, wholesale, service or industry input-providing businesses to identify opportunities for new local establishments.*
 - f) *Assess the feasibility in providing a small business incubator to nurture new local businesses.*
- ED-1.4: Encourage educational opportunities for residents of all ages to develop and upgrade skills required for employment, advancement and entrepreneurship.
- Actions:* *The County may consider implementing the following actions under this policy:*
1. *Use development funds to provide education infrastructure and training for existing and prospective workers of local industries.*
 2. *Support job training programs and skill enrichment programs.*
 3. *Encourage local school districts to establish entrepreneurial program for students.*

- ED-1.5: Work cooperatively with the Grant County Economic Development Council, Big Bend Community College, and other local jurisdictions to address employment needs consistent with county-wide regional policies.
- ED-1.6: Encourage and accommodate home-based businesses and cottage industries that are consistent with the character of adjoining properties and neighborhoods.
- Actions: *The County may consider implementing the following actions under this policy:*
1. *Promulgate special land use classifications and designate areas of the county as needed for small industry neighborhood zoning. This would enable for so-called "lone eagles" and cottage-based industries to pursue economic activity.*
 2. *Support development of telecommunications infrastructure and transportation services (including scheduled air service) required by home-based businesses and cottage industries.*
- ED-1.7: Cooperate with education providers and employers in developing facilities and programs meeting a continuum of educational needs at the K-12, college, and continuing education levels.

Goals and Policies Comment

Grant County's goals and policies for economic development (ED-1): encourage diverse employment opportunities that satisfy the socio-economic needs of Grant County residents. Policy (ED-1.2): encourages business investment as a means to provide job opportunities for Grant County residents. The City, County and Port of Coulee City have made significant investment at the park to create tourism. The Action Alternative will have a negative effect because people will not want to stay. This will not encourage business investment.

Goal ED-2: *Encourage economic growth through planning and development of the region's public services and facilities' capacity.*

Policies

- ED-2.1: Public service providers in Grant County should provide those services and facilities necessary to support a high quality of life and attract business investment.
- ED-2.2: Review land use and permitting procedures to assure that regulatory processes are understandable, predictable, and can be accomplished within

reasonable time periods in a manner that meets or exceeds state statutory requirements.

Actions: *The County may consider implementing the following actions under this policy:*

1. *Undertake comprehensive utility and other public service planning in order to take advantage of development opportunities, while addressing potential capacity shortfalls in given industrially-zoned locations within the county.*
2. *Provide planning flexibility that will be responsive to unforeseen or changing economic conditions and community desires.*
3. *Encourage long-term programs that effectively build local capacity for sustained economic development.*
4. *Support the development of transportation, and public water, sewer and utility systems that enhance economic growth.*
5. *Seek ways of cooperating with local governments and federal and state agencies to expedite land use and permitting procedures.*
6. *Evaluate issues that impinge upon permitting of natural resources and land uses.*

Goals and Policies Comment

Goals and policies (ED-2): encourage economic growth through planning and development of the region's public services and facilities capacity. Again, Coulee City and the County have invested in public water, sewer and infrastructure that effectively build local capacity for sustained economic development. The Action Alternative is contrary to this.

Goal ED-3: *Ensure an adequate supply of commercial and industrial sites to provide opportunity for new and expanding businesses to locate or remain in Grant County.*

Policies

ED-3.1: Encourage a range of commercial retail and service businesses to meet local resident needs and serve visitors to Grant County.

Actions: *The County may consider implementing the following actions under this policy:*

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1. *Encourage convenience-oriented retail within Rural Villages, UGAs, and Rural Communities that are convenient to residential neighborhoods and major employment centers.*
 2. *In cooperation with local jurisdictions, identify an inventory of suitable commercial sites adequate to meet anticipated demand during the planning period.*
- ED-3.2: Plan for a diversity of ready-to-build sites with sufficient support infrastructure and services needed to meet the demand for industrial land for the duration of the planning period.
- Actions: *The County may consider implementing the following actions under this policy:*
1. *Undertake periodic studies of industrial growth in order to set planning targets for industrial sites and adjust long-term forecasts accordingly.*
 2. *Undertake evaluations of industrial siting in regard to land use requirements and infrastructure needs.*
 3. *Encourage the re-use and redevelopment of existing industrial sites that are no longer viable for their original or previous use.*
- ED-3.3: Encourage low-cost, easily accessible, state-of-the-art telecommunications services throughout the County.
- Actions: *The County may consider implementing the following actions under this policy:*
1. *Undertake evaluations of market conditions, regulatory policies, and franchising requirements pursuant to the permitting and/or licensing of telecommunications services.*
 2. *Encourage development of state-of-the-art cable interties that meet band-width requirements for high-speed signal transmission.*
- ED-3.4: Facilitate the retention and expansion of existing local businesses and start-up of new businesses particularly those that provide family wage job opportunities and operate in compliance with applicable regulatory requirements.
- Actions: *The County may consider implementing the following actions under this policy:*

1. *Undertake prospective (and periodic) analyses of market conditions and land use needs of existing key industries.*
2. *Establish policies and programs in cooperation with local governments and state agencies to ensure business retention within the county.*

ED-3.5: Industrial sites designated under this Plan should be protected from encroaching incompatible uses.

Actions: The County may consider implementing the following actions under this policy:

1. *Develop performance and/or site design standards on non-industrial lands adjacent to designated industrial lands.*
2. *Lands designated as "Heavy Industrial" should be governed by performance standards set forth in the zoning ordinance. Such performance standards should include, but shall not be limited to:*
 - *Compliance with pertinent regulations regarding discharge of pollutants;*
 - *A maximum noise level standard;*
 - *Stream and watercourse protection;*
 - *Odor, glare, smoke, traffic and other nuisance standards.*

ED-3.6: Jurisdictions in Grant County shall regularly update inventories of land utilization, land demand, and suitable available properties for residential, industrial, commercial, public facility, and agricultural uses.

Goal ED-4: *Preserve the strength of the existing agricultural industry while diversifying the local economy by strengthening manufacturing and promoting producer services and other basic industries.*

Policies

ED-4.1: Focus business recruitment and development on firms that will diversify the local economy and can effectively serve state, national, Pacific Rim and other global markets from a Grant County location.

Actions: The County may consider implementing the following actions under this policy:

1. *1. Develop target industry profiles and analysis screens.*
2. *2. Conduct detailed analyses of prospective needs of candidate industries.*
3. *3. Conduct formal pro forma, market and regulatory analyses, and siting studies as needed.*

ED-4.2: Encourage high value-added resource based products and businesses.

ED-4.3: Encourage the establishment of industrial parks and other light manufacturing facilities and provide zoning of facilities engaged in producer services, including computer, health services, and telecommunications.

Goal ED-5: *Maximize the positive economic impact of tourism and recreational development.*

Policies

ED-5.1: Promote visitor opportunities that are compatible with or complement the character and existing uses of natural resource lands and critical areas or the rural lifestyles of Grant County.

Actions: *The County may consider implementing the following actions under this policy:*

1. *1. Encourage lodging, retail and transportation services to accommodate enhanced visitor opportunities.*
2. *2. Support efforts to develop, refurbish and maintain scenic open space, cultural and heritage resources that are attractive to both local residents and visitors.*

ED-5.2: Support local jurisdiction efforts to improve and market visitor services.

ED-5.3: Visitor facilities should be sited at locations that can be served with necessary public infrastructure and that are compatible with neighboring uses.

ED-5.4: Provide for siting and development of Master Planned Resorts.

Goals & Policies Comment

Goals and policies (ED-5): maximize the positive economic impact of tourism and recreational development. The Action Alternative will have a negative impact to this goal.

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Goal ED-6: *Improve Grant County's economy by supporting efforts to improve human and social services.*

Policies

ED-6.1: Encourage development of human and social service facilities that create job opportunities, meet community needs, and maintain Grant County's quality of life.

Actions: *The County may consider implementing the following actions under this policy:*

- 1. Cooperate with other private and public agencies to promote the establishment of adequate housing and health care to low- and moderate-income workers and their families.*
- 2. Expedite permitting of temporary housing, including group quarters.*
- 3. Promote alternative financing and development initiatives for permanent housing for low- and moderate-income workers and their families.*

ED-6.2: Support development and maintenance of human and social service facilities including, but not limited to, health care, education, transportation and other services for persons with special needs.

Goals and Policies Comment

Goals and policies (ED-6): improve Grant County's economy by supporting efforts to improve human and social service. The policy to encourage development of human and social service facilities that create job opportunities, meet community needs, and maintain Grant County's quality of life. The Action Alternative clearly does not create job opportunities and from the Coulee Community customs and culture, does not meet the community needs and negatively impacts the quality of life.

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Goal ED-7: Promote economic growth that conserves natural resources and open spaces, maintains environmental quality and rural character, and enhances the overall quality of life.

Policies

ED-7.1: Encourage commercial and industrial developments that incorporate innovative and/or experimental applications and demonstrate an ability to conserve natural resources and/or protect or enhance environmental quality.

Actions: *The County may consider implementing the following actions under this policy:*

- 1. Establish incentive programs oriented to developments using best-practice technologies (e.g., use of renewable natural resources)*
- 2. Establish program that rewards developers through expedited processes and site capacity incentives for siting or relocating facilities to areas that are compatible with surrounding land uses or critical natural resource areas.*

ED-7.2: Long-term commercially significant natural resource lands or lands in urban settlements shall be protected from encroachment from conflicting uses.

Goal ED-8: *Coordinate economic development efforts so that a clear and consistent economic policy is followed.*

Policies

ED-8.1: Work cooperatively with the Grant County Economic Development Council, Big Bend Community College, Port Districts, and other local jurisdictions to address economic development issues and make policies that are consistent with this Plan.

Actions: *The County may consider implementing the following actions under this policy:*

- 1. Build support for this economic development element by presenting its recommended policies and actions from the County's public and private partners.*
- 2. Place Grant County Economic Development Council and Grant County Long-Range Planning in joint-charge of the implementation of this element.*

Chapter 13 – Natural Setting Element

Introduction

Growth management, natural resource land conservation, and critical areas protection share problems related to governmental costs and efficiency. Sprawl and the unwise development of areas susceptible to natural hazards may lead to inefficient use of limited public resources, jeopardize environmental resource functions and values, subject persons and property to unsafe conditions, and affect the perceived quality of life. It is more costly to remedy the loss of critical areas than to conserve and protect them from loss or degradation. The inherent economic, social, and cultural values of critical areas should be considered in the development of strategies designed to conserve and protect lands.

In recognition of these common concerns, classification and designation of critical areas is intended to preclude land uses and development that are incompatible with critical areas. There are qualitative differences between critical areas: some are critical because of the hazard they represent to public health and safety; others because of the values they represent to the public welfare. In some cases, the risk posed to the public by use or development of a critical area can be mitigated or reduced through design; in other cases that risk cannot be effectively reduced except by avoidance of the critical area. Therefore, classification and designation of critical areas is intended to recognize the differences among these areas, and to develop appropriate regulatory and non-regulatory actions to respond to the differences.

Implementing development regulations that preclude uses and development that are incompatible with critical areas does not mean a prohibition of all uses or development. Rather, it means governing changes in land uses, new activities, or development that could adversely affect critical areas. Thus for each critical area, classification schemes should be defined and development regulations prepared that govern changes in land uses and new activities by prohibiting clearly inappropriate actions and restricting, allowing, or conditioning other activities as appropriate.

Critical area designations "overlay" other land use designations. That is, if two or more land use designations apply to a given parcel or portion of a parcel, both or all designations shall be made.

Purpose Of Element

The Natural Setting element emphasizes the conservation and protection of our natural environment while preserving people's lifestyles and property. Grant County and the communities within it can and will continue to grow, but this growth must occur in a way that balances nature's needs with our own. By embracing a philosophy of sustainable land use management, the County can help prevent many environmental problems and avoid the unforeseen costs associated with correcting them.

The Natural Setting Element serves two purposes. The first is to clarify the relationship between the natural environment and our built environment. The second is to carry forward the intent of the Grant County Resource Lands and Critical Areas Development Ordinance No. 93-49-CC. The ordinance provides guidelines for the designation and classification of natural resource and critical area lands and establishes regulations for their protection. This element further discusses classification and identification of such areas. By providing substantive policies and criteria that can be considered during the review of a development proposal, this element assures there is a tool not only to meet the requirements of the GMA, but also to maintain these valuable resources that help define the quality of life in Grant County. It is not the intent, however, to require existing uses to be subjected to these policies unless a change in land use is proposed in the form of a development application.

Environmental degradation or depletion of our natural resources negates some of the many reasons people wish to live here. Sensitive areas such as wetlands, open spaces, and fish and wildlife habitat contain much of the natural wealth valued by County residents. Other sensitive areas, such as land located outside fire districts or those prone to flooding are important because of the risk to lives and property posed by developing in them.

Requirements Of Other Plans

GMA Goals

The Washington State Growth Management Act (GMA) does not require a Natural Setting Element, but it does require that it address the following related goals:

- (8) **Natural Resource Industries** – Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands and discourage incompatible uses.
- (9) **Open Space and Recreation** – Encourage the retention of open space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands, and discourage incompatible uses.
- (10) **Environment** – Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
- (13) **Historic Preservation** – Identify and encourage the preservation of lands, sites, and structures that have historical or archeological significance.

Critical Areas

The GMA also requires that local jurisdictions designate five critical areas and adopt development regulations that protect them. These critical areas are:

Wetlands;

- Aquifer recharge areas;
- Fish and wildlife habitat;
- Frequently flooded areas; and
- Geologically hazardous areas.

WAC Chapter 365-190 identifies "Minimum Guidelines to Classify Agriculture, Forest, Mineral Lands and Critical Areas" (hereafter referred to as Minimum Guidelines). Grant County is required to consider the definitions found in the Minimum Guidelines when designating environmentally sensitive areas. Definitions of each critical area according to the Minimum Guidelines, including discussion of their functions and importance, are included in this Chapter.

Grant County Resource Lands and Critical Areas Development Ordinance

Grant County adopted Grant County Resource Lands and Critical Areas Development Ordinance No. 93-49-CC on May 25, 1993, in compliance with the GMA.

The Ordinance furthered the County's objectives to promote the public health, safety and general welfare by adopting provisions designed to:

1. Protect human life and health;
2. Further the public's interest in the conservation and wise use of our lands;
3. Assure the long term conservation of resource lands;
4. Preclude land uses and developments which are incompatible with critical areas;
5. Classify and designate critical areas and resource lands; and
6. To develop appropriate regulatory and non-regulatory actions in response.

The Ordinance applies to all real property within the corporate limits of Grant County. Activities on lands under federal, state, or tribal ownership may be exempt from the requirements of the Ordinance.

Natural Setting Comment

In the Natural Setting element of Grant County's Comprehensive Plan, one of the state's goal is to encourage the retention of open space and development of recreation opportunities, conserve fish and wildlife habitat, increase access to natural resource lands, and discourage incompatible uses. Grant County has designated 95 percent of Banks Lake

as open space. This was to protect the shoreline and access to the lake. Also, this was to promote and develop recreation and tourism. The Action Alternative is contrary to this goal. The drawdown will eliminate the majority of boat access to the lake. It will have a negative impact on recreation. The County has zoned 95 percent of the lake open space to protect recreation and access to the lake.

Major Issues

Critical Area Protection

The administration and enforcement of critical area protection regulations will be a recurrent issue in Grant County for some time to come. Often just talking about the protection of things like habitat and water quality protection will anger people who already believe that government regulation is too restrictive. Now that state law and local ordinance require critical area protection, education efforts on the importance of critical area protection may be the best way to address public resentment.

Water Supply

As with much of the West, water in Grant County serves competing, and often conflicting, uses. Securing certainty in our water supply will be a major issue over the 20-year planning period. Reliable access to water is necessary for direct human uses like household, agricultural, commercial, and industrial operations, and for indirect human needs such as recreation. Today, irrigated agriculture is the biggest user of water. But recently the needs of other surface water uses, particularly those dealing with the protection and restoration of anadromous fish runs, have been fiercely pursued at all levels of government.

Anadromous fish are those species, like salmon and steelhead, which are born in fresh water and eventually migrate out to sea where they spend a large part of their life. Ultimately, they attempt to return to the fresh water stream in which they were hatched in order to reproduce.

The Bureau of Reclamation Columbia Basin Project (the "Project") currently serves more than 550,000 acres of desert that have been transformed into some of the most productive agricultural land in the country. The Columbia Basin Project has fueled extensive growth in Grant County's agriculture industry, which has led to growth in complementary industries such as food processing, agricultural services, warehousing and trucking. In terms of farm-gate production value, Grant County is the second largest (behind Yakima) in the state. The overall plan for the Project calls for a total of about 1,095,000 acres of irrigated land. Due primarily to competing interest for available water to support poor salmon runs, the promise of the second phase of the Project is in jeopardy.

In February 1991, the U.S. Fish and Wildlife Service, the Washington Department of Fish & Wildlife, the three irrigation districts that make up the Project, and the U.S.

Bureau of Reclamation developed a Fish and Wildlife Plan to address the potential impacts of the proposed expansion of the Project.

In November, 1991, the National Marine Fisheries Service listed the Snake River spring/summer chinook and the Snake River fall chinook as threatened. The formal listing triggered the initiation of a recovery plan and federal agency consultation on the effects of actions on the listed salmon. This listing required the Bureau of Reclamation and other cooperating agencies in the operation of the Columbia River Power System to ensure their actions are not likely to jeopardize the continued existence of the listed species.

In 1998, the Snake River steelhead, Snake River sockeye and Upper Columbia River steelhead were listed. Over the next few years, more than a dozen additional species are anticipated to be listed under the Endangered Species Act. In September 1998, a report was issued that supported removing four dams on the lower Snake River to restore spring chinook salmon runs. The accuracy and reliability of that report has not been authenticated, and is disputed by many Grant County residents and agencies alike.

The Northwest Power Planning Council (NWPPC) is required by law to protect, mitigate, and enhance fish and wildlife affected by dams in the Columbia River Basin while also assuring the region an adequate, efficient, economical, environmentally benign, and reliable power supply. In response to the proposal to remove dams, the NWPPC has not yet taken a position on dam-breaching as of October 1998. The NWPPC implemented the largest fish and wildlife protection plan in the nation in late 1998, and intends to work closely with state and federal fish and wildlife agencies and Native American tribes to develop a decision-making framework to assist in the difficult decisions that lie ahead (J. Etchart, Chairman, Northwest Power Planning Council, October 1, 1998).

With the listing of several species as endangered and the possibility of several other listings, the competition for water uses is likely to escalate. Along with the water needs of anadromous fish habitat, the demand for water to serve our growing urban areas will increase based on expected growth and agricultural needs. The proposal to remove dams on the Snake River, while not directly affecting water supply to the Columbia Basin Project, is certainly worrisome to many.

Based on 73 years of record (1913-1986), the average annual flow of the Columbia River at Grand Coulee Dam is 79.6 million acre-feet. The net diversion from the Columbia River at Grand Coulee Dam to serve the Columbia Basin Project is about 1,500,000 acre-feet. Thus the total diversion is less than 2.0 percent of average annual flow. Some of the diverted irrigation water that is in excess of the consumptive needs of crop production eventually returns to the Columbia River between Rock Island and McNary Dams. Portions of the irrigation return flows are captured in the Potholes Reservoir system, where they are used to irrigate lands served by the Potholes system or reduce the need to supplement the Potholes Reservoir by feeding water directly from the Columbia River. Total return flows are approximately 550,000 acre-feet. (*Draft Environmental Impact*

Statement, Continued Development of the Columbia Basin Project, Bureau of Reclamation, Pacific Northwest Region, September 1989.)

If we are to sustain growth, every resident and jurisdiction within Grant County must meet the ongoing challenge of protecting and managing our water resources, and resisting proposals for elimination of the public investment we have made in reclamation and flood control projects and in economic, environmentally benign electrical power production.

Natural Setting Comment

In the natural setting element of the Comprehensive plan, one of the major issues is water supply. Securing certainty in our water supply will be a major issue over the twenty year planning period. Reliable access to water is necessary for direct human uses like household, agricultural, commercial, and industrial operations, and for indirect human needs such as recreation. The Action Alternative will create uncertainty in Coulee City's park. We have witnessed this in the past, people leave and it takes years to bring them back. Uncertainty will negatively impact the customs and culture, recreation and tourism, and the economy of the Coulee Community.

Water Quality

The water quality of our streams, lakes, and ground water influences the domestic, economic, recreational, natural and manmade environments of Grant County. We all need clean water for daily use in our homes. Residents and tourists alike use our lakes and streams extensively for recreational activities such as boating, fishing, and swimming. Many industries require clean water for manufacturing processes.

In many areas of Washington State, clean water has been taken for granted. As growth and development have increased, so have the problems associated with maintaining water quality. From industry to the individual, and commercial business to agriculture, each of us contributes in some way to reduced water quality. From this perspective, each of us must work towards its protection.

In Grant County, the impact to water quality is predominantly influenced by the Columbia Basin Project. Those impacts have been largely beneficial ones. Prior to implementation of the Project, many water bodies in the County were seasonally fed, becoming stagnant pools during dry summer months. Development of the Project enhanced such water bodies, created significant amounts of fish and wildlife habitat, and enhanced water quality.

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Critical Areas & Resource Lands

Protection Standards, Land Use & Notification

Under statutory authorization of RCW 36.70A.060, Grant County adopted Grant County Resource Lands and Critical Areas Development Ordinance No. 93-49-CC on May 25, 1993, in compliance with the GMA. The Ordinance addresses agricultural, mineral and forest resources; cultural resources; and critical areas of the County. The Ordinance may:

- identify specific protection standards, including buffers, setbacks, and mitigation, for critical areas;
- identify specific land use restrictions or requirements, including requirements for primary use, accessory use, and incidental use for critical areas; and/or
- require that notification be placed on property title and/or land division documents or for regulated activities for properties within an area identified as critical areas.

Identification and Classification

Critical areas shall be identified and classified in accordance with the requirements of Grant County Resource Lands and Critical Areas Development Ordinance No. 93-49-CC.

Maps And References

The Grant County Current Planning Department maintains a series of data maps containing the best available graphic depiction of critical areas in Grant County for the purpose of administering its Resource Lands and Critical Areas Development Ordinance. These maps are for information and illustrative purposes only and are not regulatory in nature.

The maps are intended to alert the development community, appraisers, and current or prospective owners of a potential encounter with a use or development limiting factor based on the natural systems present. The indication of the presence of a critical area on the maps is sufficient cause for the County to request a site-specific analysis for the critical areas identified prior to acceptance of a development application as being complete and ready for processing.

The maps are to be used as a general guide to the location and extent of critical areas. Critical areas indicated on the maps are presumed to exist in the locations shown. The exact location and extent of critical areas shall be determined by the applicant as a result of field investigations performed by qualified professionals using the definitions found in the Resource Lands and Critical Areas Development Ordinance.

Resource Lands

Agricultural, Mineral and Forest Resources are defined and designated as specified in the Resource Lands Sub-element contained in Chapter 5 – Land Use Element.

Cultural Resources

Cultural resources are those items, both tangible and intangible, that provide us with ties to the past, a better understanding of the present, and our hope for what the future might hold. Native Americans, like the Columbia and Wanapum people, have traveled over the landscape that is now Grant County harvesting the roots and plants for food and medicine, taking shelter where the land suited them. Ensuring that a record of their presence is preserved is of concern not only to Native Americans, but to all residents. Preservation of our cultural resources, including archaeological sites and objects, traditional cultural lands, food gathering areas, and burial grounds, is important to Grant County's health and prosperity. The goals and policies of this Element serve to preserve and protect significant cultural resources of the County.

Wetlands

Wetlands are fragile ecosystems that serve a number of important beneficial functions. Wetlands assist in the reduction of erosion, siltation, flooding, ground and surface water pollution, and provide wildlife, plant, and fisheries habitat. Wetland destruction or impairment may result in increased public and private costs or property loss.

In Grant County, the wetland environment is predominantly a function of irrigation. The Columbia Basin Project currently irrigates about 660,000 acres. Reservoirs, canals, laterals, and waste ways constructed to serve these irrigated lands have contributed to rising water tables, seep lakes, ponds, and perennial wetlands in nearly all areas of the Project. The Project has provided beneficial wetlands to more than 110,000 acres of naturally drainage-impaired lands. Vegetative growth in such drainage-impaired lands has improved food, cover, and nesting habitats for many wildlife species. These wildlife populations have provided recreational opportunities in the project area for sportsmen.

In Grant County, the term "wetlands" pertains to both naturally and artificially created wetlands—except those wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. In accordance with the above and the requirements of the Resource Lands and Critical Areas Development Ordinance, the following activities are exempt:

- Operation, maintenance, and construction of Columbia Basin Project-related facilities by the U.S. Bureau of Reclamation as they pertain to the unintentional creation of wetland sites, namely those unintentional wetlands created after 1952 as a result of the Columbia Basin Irrigation Project;

- Ongoing and existing farming and ranching activities such as, but not limited to, (1) grazing, plowing, seeding, cultivating, harvesting for the production of food, (2) construction of facilities in support of farming operations, or (3) upland soil and water conservation practices;
- Maintenance of farm or stock ponds, irrigation ditches, drainage ditches, and farm roads in accordance with best management practices to assure that wetlands and/or their buffers are not adversely impacted;
- Maintenance, repair, operation or minor improvement of existing public streets, highways, or roads within the right-of-way; and
- Maintenance, repair, or operation of existing public utilities and noxious weed control.

In their natural state, wetlands are transitional areas between upland and aquatic environments where water is present long enough to form distinct soils and where specialized "water loving" plants can grow. Wetlands include natural marshy areas along shorelines, inland swamps, and seasonal water courses. Wetlands are typified by a natural water table that usually is at or near the surface, and there may be standing water all or part of the year. Soils that are present in wetlands are known as "hydric soils". Certain plant species, including trees, shrubs, grasses, and grasslike plants have adapted to the low oxygen content of wetland soils. These plants are known as "hydrophytes".

Another distinguishing characteristic of wetlands, in addition to soil type and types of plants present, is the wetness of the soil, or "hydrology" (i.e., how often is the soil saturated or flooded with water and how long does it last?). Indicators of wetland hydrology may include drainage patterns, sediment deposition, watermarks, stream gauge data, flood predictions, historic data, visual observation of saturated soils, or flooded soils.

In their natural state, wetlands perform functions that are impossible or difficult and costly to replace. Wetlands provide erosion and sediment control; the extensive root systems of wetland vegetation stabilize stream banks, floodplains, and shorelines. Wetlands improve water quality by decreasing the velocity of water flow, resulting in the physical interception and filtering of waterborne sediments, excess nutrients, heavy metals, and other pollutants. Wetlands also provide food and shelter, essential breeding, spawning, nesting and wintering habitats for fish and wildlife, including migratory birds, anadromous fish, and other species.

The following references may provide an indication of wetland locations in Grant County. However, these and similar resources were not prepared at a level of detail sufficient to accurately portray the exact location and extent of wetlands in Grant County, and cannot be used in place of an on-site field determination of wetlands. Mapping resources include:

- National Wetland Inventory; and
- Natural Resources Conservation Service soils maps for Grant County, hydric soils designations.

Wetlands are fragile ecosystems that serve a number of important beneficial functions. Wetlands assist in the reduction of erosion, flooding, ground and surface water pollution, and provide wildlife, plant, and fisheries habitat. Wetlands destruction or impairment may result in increased public and private cost of property loss. The Action Alternative may impair the wetlands around Banks Lake. Lowering the lake ten feet during the hottest time of the year over a month could be damaging. Again, this is contrary to what the County considers important.

Shoreline Master Program

Overview

The shorelines of the state are among the most valuable and fragile of our natural resources and there is great concern throughout the state relating to their utilization, protection, restoration, and preservation. In addition, ever increasing pressures of additional uses are being placed on the shorelines necessitating increased coordination in their management and development. Furthermore, much of the shorelines and uplands adjacent thereto are in private ownership. Unrestricted construction on the privately- or publicly-owned shorelines is not in the best public interest; and, therefore, coordinated planning is necessary in order to protect the public interest associated with the shorelines while, at the same time, recognizing and protecting private property rights consistent with the public interest. There is, therefore, a clear and urgent demand for a planned, rational and concerted effort, jointly performed by local, state, and federal governments, to prevent the inherent harm in uncoordinated and piecemeal development of our shorelines.

By ratifying Initiative 43B in the 1972 General Election, the people of the state approved the Shoreline Management Act of 1971 (RCW 90.58). This law vests counties and cities with the primary responsibility for comprehensively planning and reasonably regulating shoreline development and use. The goals, shoreline area designations, policies, regulations, and procedures set forth in the shoreline management master program are essential to the protection of the public health, safety and general welfare of the people of Grant County.

Purpose

The purposes of the Master Program are:

- To promote the public health, safety and general welfare by providing long range, comprehensive policies and effective, reasonable regulations for development and use of Grant County shorelines.

- To implement this program in a positive, effective, and equitable manner.
- To further assume and carry out the responsibilities established by the act for Grant County, and to foster by adoption the policy contained in RCW 90.58.020 for shorelines of the state: It is the policy of the state to provide for the management of the shorelines of the state by planning for and fostering all reasonable and appropriate uses. This policy is designed to insure the development of these shorelines in a manner which, while allowing for limited reduction of rights of the public in the navigable waters, will promote and enhance the public interest. This policy contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state and their aquatic life, while protecting generally public rights of navigation and corollary rights incidental thereto. The legislature declares that the interest of the people shall be paramount in the management of shorelines of statewide significance. The Department of Ecology, while adopting guidelines for shorelines of statewide significance, shall give preference to uses, in the following order which:
 1. recognize and protect the statewide interest over local interest;
 2. preserve the natural character of the shoreline;
 3. result in long-term over short term benefit;
 4. protect the resources and ecology of the shoreline;
 5. increase public access to publicly owned areas of the shorelines;
 6. increase recreational opportunities for the public in the shoreline;
 7. provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.

In the implementation of this policy the public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally. To this end, uses shall be preferred which are consistent with control of pollution and prevention of damage to the natural environment or are unique to or dependent upon use of the state's shoreline. Alterations of the natural condition of the shorelines of the state, in those limited instances when authorized, shall be given priority for single family residences, ports, and shoreline recreational uses. These recreational uses include, but are not limited to parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or their use of the shorelines of the state, and other developments that will provide an opportunity for

substantial numbers of people to enjoy shorelines of the state. Permitted uses in the shorelines of the state shall be designed and constructed in a manner to minimize, insofar as practical, any resultant damage to the ecology and environment of the shoreline area and any interference with the public's use of the water. Any damage that occurs as a result of permitted uses should be mitigated.

Grant County Shoreline Master Program

The Growth Management Act requires counties with an adopted shoreline master program to include the goals and policies of such program in the county's comprehensive plan. The shoreline master program goals and policies are to be considered an element of the comprehensive plan and the regulations are to be considered a part of the county's development regulations (RCW 36.70A.480). The Grant County Shoreline Master Program was adopted in 1975, and needs revision. Grant County intends to update the Shoreline Master Program after this Plan is adopted. Therefore, rather than include the goals and policies of the 1975 Shoreline Master Program in this Comprehensive Plan, the County adopts the following goals and policies to guide the update of the Shoreline Master Program.

Program Goals

In addition to the purpose stated above, the development of the Shoreline Master Program will be guided by the following nine goal statements pursuant to the program elements specified in RCW 90.58.100(2). These goals provide an overall, comprehensive foundation and sense of direction upon which the policies, regulations, shoreline area designations, and administrative procedures will be based. These following goals will provide overall guidance for the management of the shorelines of Grant County:

- **Shoreline use** – To allow for compatible uses of the shorelines in relationship to the limitations of their physical and environmental characteristics. Such uses should enhance rather than detract from, or adversely impact, the existing shoreline environment.
- **Conservation** – To preserve, protect, and restore the natural resources of Grant County's shorelines in the public interest and for future generations. These natural resources include but are not necessarily limited to fish, wildlife, vegetation, and natural features found in shoreline regions. Only renewable resources should be extracted and in a manner that will not adversely affect the shoreline environment.
- **Public access** – To provide safe, convenient, properly administered and diversified public access to publicly owned shorelines of Grant County without infringing upon the personal or property rights of adjacent residents. Such access should not have an adverse impact upon the environment.

- **Circulation** – To permit safe, adequate, and diversified transportation systems that are compatible with the shorelines, resulting in minimum disruptions to the shoreline environment.
- **Economic development** – To promote and encourage the optimum use of existing industrial and economic areas for users who are shoreline dependent and shoreline related and can harmoniously coexist with the natural and human environments; and, subsequently, to create similar areas as need arises with minimum disruption of the shorelines.
- **Recreation** – To encourage the provision and improvement of private and public recreation along the shorelines of Grant County only to the extent that the environment is not impaired or degraded.
- **Historical/Cultural/Educational** – To identify, protect, and restore those shoreline areas and facilities that are of historical, cultural or educational value. Public or private organizations should be encouraged to provide public access and protection of such areas and facilities.
- **Restoration and enhancement** – To restore and enhance those shoreline areas and facilities that are presently unsuitable for public or private access and use.
- **Implementation Process** – Provide an efficient system for administering shoreline permit applications which would eliminate unnecessary duplication of effort or jurisdictional conflicts, yet assure complete coordination and review. Provide a process to periodically update the inventory, goals, policies, and regulations to achieve responsiveness to changing attitudes and conditions.

Shorelines of Statewide Significance

The Washington State legislature designated certain shorelines as shorelines of statewide significance from which all of the people of the state derive benefit and that these shorelines should, therefore, be managed with the interest of all of those people in mind. The Act requires that the Master Program give preference to uses and developments that are consistent with the principle of statewide over local interest. The legislature determined that in order to fulfill the goal of statewide public interest in shorelines of statewide significance, local Master Programs shall give preference to uses that are consistent with the policies applied in the following order, pursuant to RCW 90.58.020:

1. The statewide interest should be recognized and protected over the local interest.
2. The natural character of shorelines of statewide significance should be preserved.
3. Uses of shorelines of statewide significance should result in long term benefits to the people of the state.

4. The natural resources and ecological systems of shorelines of statewide significance should be protected.
5. Public access to publicly owned areas in shorelines of statewide significance should be increased.
6. Recreational opportunities for the public should be increased on shorelines of statewide significance.

Shoreline Master Program Comment

Grant County's shoreline master program has the following goals that will provide overall guidance for the management of the shorelines of Grant County; shoreline use, economic development and recreation. The state recognizes public access and recreational opportunities be given preference in our local shoreline master program. The Action Alternative is contrary to both the State and County's goals. The drawdown limits access to the lake because the majority of the boat launches will be high and dry thereby limiting recreational opportunities especially around the Coulee Community.

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Goals & Policies

Goals and policies follow the shared vision for the future of Grant County for sustaining and improving our quality of life. Goals and policies are also consistent with the Planning Goals of the Growth Management Act. Goals are broad statements of a community's aspirations. Policies express a commitment to a course of action. Policies provide overall direction for implementation of a strategy. Policies provide clear guidance for decision-making subject to this Plan, and form the basis for development regulations. Goals and policies do not apply to incorporated cities, but rather, only to unincorporated areas of the County, including the unincorporated portions of UGAs.

Following are the goals and policies of the Comprehensive Plan related to the Natural Setting of Grant County.

Resource Lands

Goals and policies related to resource lands are presented in the Resource Lands Sub-element.

Cultural Resources

Goal NS-1: Identify, preserve and protect historic, cultural and archaeological resources found to be significant by recognized local, state or federal processes.

Policies

- NS-1.1: Identify known, recorded archaeological, cultural and historic resources.
- Action:* Obtain a listing of sites in Grant County from the Washington State Office of Archaeology and Historic Preservation, Department of Community, Trade and Economic Development.
- Action:* The County should develop an "Cultural Resource Lands Map and Database" to gather relevant information on cultural, historic and archaeological resource lands into one location and format. The map should show the locations of all Cultural Resource Lands and relate to an OAHF database and the Grant County Assessor database.
- Action:* The County should establish a Cultural Resource Task Force comprised of citizens, Wanapum Band, OAHF, DNR, other state agency, Grant County PUD, city and County representatives to develop inventories of significant and potentially significant sites.
- NS-1.2: Develop a local process for evaluating the significance of historic, cultural, and archaeological resources.
- NS-1.3: Preserve areas that contain valuable historical or archaeological sites of Federal, State, tribal, or local significance. Maintain and enforce provisions to the Resource Lands and Critical Areas Ordinance requiring conditioning of project approval on findings made by a professional archaeologist for development activities on sites of known cultural, historical or archaeological significance.
- NS-1.4: Prior to demolition, moving, or alteration to any designated historic, cultural, and archaeological landmark, ensure that due consideration is given to its preservation or, at a minimum, documentation of its historic, cultural or archaeological value.

Critical Areas

Goal NS-2: *Wetlands should be protected because they provide important functions that add to the quality of life.*

Policies

- NS-2.1: Wetland areas should be identified by the development applicant and reviewed by the County prior to development. If a wetland is determined to exist on a parcel subject to a non-exempt development activity, a written delineation should be required of the applicant.

- NS-2.2: The County should consider accepting written determinations, delineations and mitigation plans only from the U.S. Army Corps of Engineers, the Department of Ecology, the Natural Resources Conservation Service, or a qualified critical areas professional. The County should consider requiring that mitigation plans for unavoidable wetland impacts to be based on a wetland functional assessment.
- NS-2.3: Based on their quality demonstrated by the classification system defined in the Resource Lands and Critical Areas Ordinance, wetlands should be protected from alterations due to land use changes that may create adverse impacts to the wetland.
- NS-2.4: The County should consider incorporation of the Washington State Wetlands Rating system for Eastern Washington (Ecology Publication #91-58) into the classifications system adopted in the Resource Lands and Critical Areas Ordinance.
- NS-2.5: The County should consider incorporation of the Washington State Department of Ecology Manual titled "Washington State Wetlands Identification and Delineation Manual, March 1997" into the classifications system adopted in the Resource Lands and Critical Areas Ordinance.
- NS-2.6: Whenever feasible, innovative techniques that enhance a wetland and promote it as a useful, functioning part of the development will be encouraged.
- NS-2.7: Wetland preservation strategies and efforts, including wetland banking, should be coordinated with appropriate local, state and federal agencies and private conservation organizations to take advantage of both technical and financial assistance and to avoid duplication of efforts.

Shoreline Management

Protecting Grant County's shoreline environment is of importance to preserving the economic, environmental and cultural resources of our community. The shoreline policies that follow have been crafted to recognize these unique and valuable shoreline resources and to protect them for the benefit of future generations. These policies are intended to be consistent with the Shoreline Management Act, Chapter 90.58 RCW.

Goal NS-9: The County should recognize and protect the functions and values of the shoreline environments of statewide and local significance. For shorelines of state-wide significance (SSWS), protection and management priorities are to:

- a. Recognize and protect the state-wide interest over local interest;***

- b. Preserve the natural character of the shoreline;*
- c. Provide long-term over short-term benefit;*
- d. Protect the resources and ecology of shorelines;*
- e. Increase public access to publicly owned areas of shorelines; and*
- f. Increase recreational opportunities for the public in shoreline areas.*

Policies

NS-9.1: General Shoreline Use:

1. Maintain areas within the shoreline jurisdiction with unique attributes for specific long-term uses, including agricultural, commercial, industrial, residential, recreational and open space uses.
2. Ensure that proposed shoreline uses are distributed, located and developed in a manner that will maintain or improve the health, safety and welfare of the public when such uses occupy shoreline areas.
3. Ensure that activities and facilities are located on the shorelines in such a manner as to retain or improve the quality of the environment.
4. Ensure that proposed shoreline uses do not infringe upon the rights of others, upon the rights of private ownership, upon the rights of the public under the Public Trust Doctrine or federal navigational servitude, and treaty rights of Indian tribes.
5. Minimize the adverse impacts of shoreline uses and activities on the environment during all phases of development (e.g. design, construction, management and use).

NS-9.2: Economic Development:

1. Ensure healthy, orderly economic growth by allowing those economic activities which will be an asset to the local economy, and for which the adverse effects on the quality of the shoreline and surrounding environment can be mitigated.
2. Protect current economic activity (e.g. shipping, marinas, agriculture, etc.) that is consistent with the policies of the SMP.
3. Develop, as an economic asset, the recreation industry along shorelines in a manner that will enhance public enjoyment.

4. Ensure that any economic activity taking place along the shorelines operates without causing irreparable harm to the quantity of the site's environment or adjacent shorelands.
5. Protect current agricultural land uses of long-term commercial significance and provide for development of new agricultural uses for which adverse environmental effects can be mitigated.

NS-9.3: *Circulation:*

1. Provide safe, reasonable, and adequate circulation systems to shorelines where routes will minimize adverse effects on unique or fragile shoreline features and existing ecological systems, while contributing to the functional and visual enhancement of the shoreline.
2. Within the shoreline jurisdiction, locate land circulation systems that are not shoreline dependent as far from the land-water interface as practicable to reduce interference with either natural shoreline resources or other appropriate shoreline uses.

NS-9.4: *Conservation:*

1. Develop and implement management practices that will ensure a sustained yield of renewable resources of the shorelines while preserving, protecting, enhancing and restoring unique and nonrenewable shoreline resources, environments, or features.
2. Reclaim and restore areas that are biologically and aesthetically degraded to the greatest extent feasible.
3. Preserve scenic vistas, aesthetics, and vital estuarine areas for fisheries and wildlife protection.

NS-9.5: *Public Access:*

1. Ensure that developments, uses, and activities on or near the shoreline do not impair or detract from the public's access to the water. Where practicable, public access to the shoreline should be enhanced.
2. Design public access projects such that they provide for public safety and minimize potential impacts to private property and individual privacy.

NS-9.6: Recreation:

1. Optimize recreational opportunities now and in the future in shoreline areas.
2. Encourage federal, state and local governments to acquire additional shoreline properties in Grant County for public recreational uses.

NS-9.7: Historic/Cultural/Scientific:

1. Identify, protect, preserve, and restore important archeological, historical, and cultural sites located in shorelands.
2. Encourage educational projects and programs that foster a greater appreciation of the importance of shoreline management, maritime activities, environmental conservation, and maritime history.
3. Prevent public or private uses and activities from destroying or damaging any site having historic, cultural, scientific or educational value without appropriate analysis and mitigation.

NS-9.8: Wetlands:

1. Preserve and protect natural (non-exempt) wetlands to prevent their loss and degradation.
2. Identify natural (non-exempt) wetlands areas and boundaries according to established identification and delineation procedures.
3. Provide adequate mitigation for disturbance of natural (non-exempt) wetlands and buffers in the shoreline environment.
4. Maintain a wetland buffer zone of adequate width between a natural (non-exempt) wetland and adjacent development to protect the functions and values of the wetland.
5. Base the width of the established buffer zone upon the functions and values of the natural (non-exempt) wetlands.
6. Natural (non-exempt) wetlands that are impacted by activities of a temporary nature should be restored upon project completion.
7. Give preference to in-kind and on-site replacement of wetland functions and values. Where in-kind and/or on-site replacement is not feasible or practical due to the characteristics of the existing

wetland or property, mitigation of equal or greater ecological value should be provided off site.

8. Require an applicant to monitor mitigation plans, and to take corrective action if necessary, in order to ensure long-term success of mitigation projects.
9. Develop standards and procedures for wetland banking allowing for approval of wetland mitigation banks on a case by case basis until such standards and procedures are adopted.

NS-9.23: Recreational Development:

1. Locate and design shoreline recreational developments to reflect population characteristics, density and special activity demands.
2. Design recreational developments to minimize adverse impacts on the environment.
3. Encourage a variety of compatible recreational experiences and activities to satisfy diverse recreational needs.
4. Encourage the linkage of shoreline parks, recreation areas, and public access points with linear systems, such as hiking paths, bicycle paths, easements and/or scenic drives.
5. Locate and design recreational developments to preserve, enhance, or create scenic views and vistas.
6. Locate, design and maintain trails and pathways to protect bank stability.

Natural Setting Comment

In the Natural Setting element of the County's comprehensive plan, the Action Alternative is in conflict with the goals and policies. Goal NS-9.2; wetlands should be protected because they provide important functions that add to the quality of life. Dropping the lake down ten feet during the driest, hottest time of the year could negatively affect the wetlands around the lake. Goal NS-9: Shoreline Management. Lowering the lake will impact the shoreline, it will negatively impact economic development, it restricts public access to the lake, impedes recreational opportunities, could damage wetlands and lower residential development because of the negative visual quality of the mud bogs and the threat of the West Nile virus.

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Environment Justice

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The US Census Bureau shows Coulee City at 15 percent of the population below the poverty level. Grant County is 13 percent and the State of Washington is seven percent population below the poverty level. The Action Alternative will have an adverse environmental justice impact on the low-income population. With a relatively high level of families at poverty level and 21 percent of families income below \$25,000 per annum, which is much higher than the County or State, loss of business to the Coulee Community will only exasperate this situation.

The Action Alternative will negatively impact the low-income in this community. Because the Northern Region relies heavily on tourism/recreation, dropping the lake to an unusable level will negatively impact business, causing layoffs, only adding to a relatively high impoverished area.

Visual Quality

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The Action Alternative will have a negative impact on the visual quality of this area. There will not be a five foot strip of base land around the lake, but a ten foot strip of land. There are many shallow areas in the lake, especially the southern part along Highway 155. The drawdown will create large mud flats that will decrease the visual quality of the lake in the northern part of the lake at Steamboat Rock State Park; the Devils Punch Bowl Bay will also create large mud flats. In addition, Osborn Bay will have a large mud flat. The drawdown will have a negative visual quality to this area, especially the most heavily visited areas. The five foot drawdown is bad enough, but a ten foot drawdown will be excessive to the visual quality of our environment.

Wildlife

The drawdown occurs at peak fishing/tourism season and would devastate the local communities along the lake, on the major Highway Routes of Highways 2, 17, and 155. Without the ability to generate revenue and taxes, these communities lose their tax base and the ability to survive. The Action Alternative will create a large shoreline of mud and stagnant water pools, the breeding grounds for mosquitoes. Nowhere in the EIS does it address the issue of mosquitoes, the mosquito born disease West Nile Virus. This virus has reached Washington and documented cases of infected horses and crows have occurred. Experts expect to document human cases and other bird cases in 2003. The EIS makes no attempt to document any impacts, or casual effects of this mosquito borne virus on humans, animals, or birds. No strategy of the use of pesticides, or the impacts is given. Alternative supplies of water to enhance flow augmentation are available from dam and reservoir release in Canada. Needless threatening the health of humans, animals, and birds makes no sense.

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Banks Lake is a known habitat for the endangered specie, the Bald Eagle. Northrup Canyon, near the north end of Banks Lake supports a small but surviving population of our country's national bird, the Bald Eagle. Impacts to the Bald Eagle as a listed endangered species and potential negative ramifications must be researched. Prior to the arbitrary choice of any one of the Action Alternatives, it would be prudent to determine the impact any Action Alternative may have on currently listed, dependant species. This may include the recently listed pygmy rabbit populations in neighboring Douglas County. Will decreasing the level of Banks Lake effect down gradient, dependant watering sources during the hottest driest time of the year? Hydraulic

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continuity of underground aquifers is not addressed in any of the Action Alternatives. There are a number of similar questions left unanswered or omitted in this draft EIS. The Action Alternative could have a negative impact to not only animals but also the Bald Eagle.

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Social Environment

While recreation opportunities will decline at Banks Lake during the period of drawdown, especially the Coulee Community, other opportunities for water-based recreation are nearby. The problem with the nearby opportunities is they are already heavily used. It is a fallacy to believe there is other nearby recreational opportunities that Bank Lake has to offer. Overall impact to the Northern Region of Grant County economy will be great. This area depends on tourism/recreation. While lost income for the businesses will negatively affect their financial viability, the degree of impact will depend in part upon their ability to adapt their facilities to the lower lake levels in August. It will be extremely difficult to adapt their facilities with a drop in income. Grand County, the City of Coulee City and the Port of Coulee have invested a large amount of money in infrastructure in the park, camping area, boat facilities and the swimming area. This was to attract tourism/recreation and create jobs for the Coulee Community. The Action Alternative will adversely affect this investment. It will also adversely affect the low-income in the Coulee Community as explained in the environmental justice section and economic section.

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The social value of those who desire increased water for endangered salmon will have a minimal effect. The additional drawdown in the Action Alternative will only supply an additional one to two percent flows at McNary Dam. The Snake River fall

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Chinook juvenile migration tends to peak in mid-July with numbers tapering off into mid-August. Nearly half of the Snake River fall Chinook can be transported from the Snake River collector dams and will not benefit from flow augmentation from the Columbia River. In addition, there is uncertainty surrounding flow augmentation benefits for fish survival. Therefore, the social value of the Action Alternative will be nil.

The Action Alternative will negatively impact the recreational opportunities and economy of the Northern Region of Grant County. The local governments have made large investments in infrastructure to increase tourism thereby creating jobs. Again the Action Alternative will negatively impact this. The drawdown in August and part of September to increase flows of one to two percent to help salmon when their peak migration is mid-July has no social value, especially when you can barge them and there is uncertainty surrounding flow augmentation as a benefit.

Grant County government, which is responsible for our public's health, safety and general welfare, is very, very concerned over the potential negative impacts the Action Alternatives hold for our citizens!

We are also doing our best to understand the process we and our citizens are being forced to endure.

First, a biological opinion was produced which included a theory or hypothesis that increasing the river flow would support more fish.

Second, action plans are developed to support the theory presented in the biological opinion.

Third, the public, dependent on the river's water, is put through numerous processes to defend their uses of this water.

Fourth, studies designed to support and reinforce the biological opinion theory have repeatedly missed the mark and are non-conclusive and are generally questioned by the scientific community.

Common sense must prevail in this process.

1. Put this draft EIS on hold;
2. Prove or disprove the biological opinion theory;
3. Then study the impacts of all Action Alternatives; and
4. Address and mitigate all impacts raised during the EIS process, including our populations, customs and culture.

In conclusion, in 1998 the legislature passed, and Governor Lock signed, ESHB 2496, an act relating to salmon recovery. In passing the Salmon Recovery Act, the legislature declared that the state should "retain primary responsibility for managing the natural resources of the state, rather than to abdicate those responsibilities to the federal government." This law set up a voluntary and locally-based salmon habitat restoration process, led by lead entities consisting of counties, cities, and tribal governments. The function of the entities is to develop a list of projects that help restore and protect habitat for fish within a Water Resource Inventory Area. The Act also created our state's Independent Science Panel to "help ensure that sound science is used in salmon recovery efforts."

Independent scientific review provides decision makers with technical feedback and perspectives that do not reflect a particular vested interest or point of view. The Independent Science Panel was established under the Salmon Recovery Act of 1998; its purpose is to provide scientific review and oversight of the state's salmon recovery efforts and to review the adequacy of the salmon recovery plans developed by the state. Other independent science bodies have been established and are operating in the

Columbia River Basin; they were established under the Northwest Power Planning Act to advise the Power Council and its fish and wildlife program, and to review projects proposed for funding. The Governor's Salmon Recovery Office will review the role of the Independent Science Panel to ensure their work is aligned with the most pressing needs facing the state and report to the Governor by April 15, 2003. It seems premature to implement the Action Alternative prior to the Independent Science Panel report to the Governor.

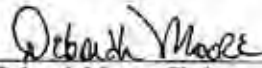
The Action Alternative will negatively impact the Coulee community customs and culture. Grant County is demanding that those customs and culture be preserved under NEPA.

The Action Alternative is contrary to elements of our Comprehensive Plan. It is in conflict with our policies and goals of our Policy Plan. It is in conflict with our policies and goals of the Economic Development element. It is also in conflict with our policies and goals of our natural settings.

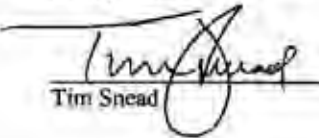
The Action Alternative will negatively impact the visual quality, environmental justice, social environment, wildlife and the local economy of the Coulee Community. The negative impact of the Action Alternative far out weighs the minimal, uncertain benefits to salmon.

Respectfully submitted,

BOARD OF COUNTY COMMISSIONERS


Deborah Moore, Chair


LeRoy Allison


Tim Snead



GRANT COUNTY
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May 31, 2001

Jim Blanchard
Bureau of Reclamation
32 C Street, Box 815
Ephrata, WA. 9882

Re: Request to participate in NEPA Process as Cooperating Agency

Dear Mr. Blanchard:

Pursuant to 40 C.F.R. @ 1506.2(b), the purpose of this letter is to request that Grant County be granted cooperating agency status in the completion of the environmental assessment or environmental impact statement pursuant to the National Environmental Policy Act (NEPA) for 10 foot draw down of Banks Lake. Pursuant to the regulations implementing NEPA, to which all federal agencies must comply (40 C.F.R.@1507.1) state and local governments may be granted (see 40 C.F.R.@1508.12) cooperating agency status when the state or local government has "special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment". 40 C.F.R.@1508.5. In this case, Grant County has special expertise relating to the analysis of the federal agency's proposed decision on the physical environment, custom, culture and local tax base

Additionally, according to the regulations, federal agencies shall cooperate to the fullest extent possible with state and local agencies. The regulations specifically state:

- (b) Agencies shall cooperate with State and local agencies to the fullest extent possible to reduce duplication between NEPA and State and local requirements, unless the agencies are specifically barred from doing so by some other law...such cooperation shall be to the fullest extent possible including:
 - (1) Joint planning processes;
 - (2) Joint environmental research studies
 - (3) Joint public hearings (except where otherwise provided by statute);
 - (4) Joint environmental assessments.
- (c) Agencies shall cooperate with State and local agencies to the fullest extent possible to reduce duplication between NEPA and comparable State and local requirements, unless the agencies are specifically barred from doing so by some other law. Except for cases covered by paragraph (a) of this section, such

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Attachment 1

cooperation shall be to the fullest extent possible, including joint environmental impact statements. In such cases one or more Federal agencies and one or more State or local agencies shall be joint lead agencies. When State laws or local ordinances have environmental impact statement requirements in addition to but not in conflict with those in NEPA, Federal agencies shall cooperate in fulfilling these requirements as well as those of Federal laws to that one document will comply with all applicable laws.

- (d) To better integrate environmental impact statements into State or local planning processes, statements shall discuss any inconsistency of a proposed action with any approved State or Local plan and laws (whether or not federally sanctioned). Where an inconsistency exists, the statements should describe the extent to which the agency would reconcile its proposed action with the plan or law.

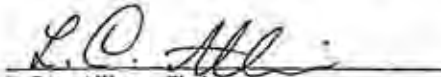
40 C.F.R.@1502.2(b)(6)(d).

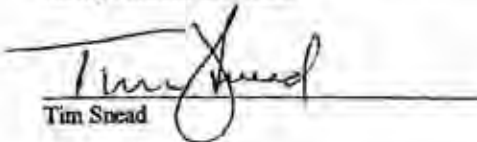
Therefore to ensure that the federal agency fully and adequately considers the effect of its proposed decision on the physical environment, customs, culture, and tax base of the citizens of Grant County, Grant County hereby request to be named a cooperating agency.

We thank you for your consideration.

Sincerely,

Board of Commissioners Grant County


LeRoy Allison, Chairman


Tim Sneed

TS/gp

PUBLIC SCOPING MEETING ON BANKS LAKE DRAWDOWN

Please come to the Bureau of Reclamation's (Reclamation) scoping meeting to get information about the potential drawdown of Banks Lake in northwest Washington State. Reclamation will present alternatives being considered to draw the lake down up to 10 feet and provide opportunities to identify issues and concerns associated with the proposed alternatives or identify other alternatives for the Banks Lake drawdown. This scoping meeting is *not* part of the Banks Lake Resource Management Plan Environmental Assessment.



WHEN AND WHERE

TUESDAY, MAY 15, 2001

COULEE CITY

7:00 - 9:00 p.m.

Coulee City Middle School
Gym

312 East Main Street
Coulee City, Washington
(509) 632-5312

DIRECTIONS:

From State Highway 22, turn south at 4th Street — the Main Entrance to Coulee City. Continue south for five blocks to Main Street (the post office is on the east corner). Turn east on Main Street. Continue east on Main Street for five blocks. Main Street ends at the Coulee City Middle School. Parking is available in front of the main entrance to the school. After entering the building, proceed straight to the gym.

BACKGROUND

Action 31 of the Federal Columbia River Power System (FCRPS) Biological Opinion, issued by the National Marine Fisheries Service on December 21, 2000, calls for the assessment of operation of Banks Lake at up to 10 feet below full pool during August of each year. The reduction of pumping into Banks Lake will increase the amount of water available to support endangered salmonid stocks in the Columbia River.

This action would constitute a change in existing operations, although it is within existing operating authorization. Reclamation is currently authorized to operate the reservoir down to 5 feet below full pool; however, for the past 5 years it has been operated at close to full pool throughout the year to increase the generating capability of the pump/generators at Grand Coulee. Previous operations were within the top 2 feet of full pool during irrigation season, and then the reservoir level was drawn down 5 feet during the nonirrigation season.

BANKS LAKE

Banks Lake is operated as a re-regulation reservoir for the Columbia Basin Project (CBP). The reservoir is approximately 27 miles long and contains slightly more than 1 million acre-

feet of water at full pool. The water supply for the reservoir is stored behind Grand Coulee Dam and is lifted from Franklin Delano Roosevelt Reservoir into Banks Lake. Water is delivered into the Main Canal at Dry Falls Dam on the southern end of Banks Lake and from there delivered to approximately 670,000 acres. This is just over one-half of the authorized lands for the CBP.

WHAT RECLAMATION IS DOING

Reclamation is preparing an environmental impact statement (EIS) under the National Environmental Policy Act (NEPA). The No Action Alternative will be the current operation, which is a 5-foot drawdown in August for fish flows as called for by Action 23 of the December 21, 2001, FCRPS Biological Opinion. Under NEPA, impacts of this alternative must be evaluated and will form the basis for comparison of impacts among the action alternatives. A range of action alternatives to draw the lake down 10 feet during August of each year will be developed. The draft EIS will evaluate impacts of these alternatives compared to the No Action Alternative.

WHAT YOU CAN DO

ATTEND THE SCOPING MEETING

We need your interest and input to help address this action. Please come to the public scoping meeting and share your thoughts with us. A scoping summary describing issues identified at the scoping meeting, and in written comments received, will be developed and made available to the public. If you are unable to attend, please send us your written comments on the attached sheet by May 31, 2001.

The meeting facilities are physically accessible to people with disabilities. Please direct requests for sign language interpretation for the hearing impaired, or other special needs, to Jim Blanchard, Bureau of Reclamation at telephone (509) 754-0226, or fax (509) 754-0239. The hearing impaired may contact Mr. Blanchard at the above number via a toll free TTY relay at (800) 833-6388.

PROVIDE YOUR COMMENTS

If you would like to be on the mailing list, provide a comment, or request a copy of the draft EIS, you can send the attached comment sheet in the enclosed postage-paid envelope.

**IF WE DO NOT HEAR FROM YOU,
WE WILL REMOVE YOUR NAME FROM THIS MAILING LIST.**

FOR ADDITIONAL INFORMATION, YOU MAY CONTACT:

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street, Box 815
Ephrata, WA 98823
telephone: (509) 754-0226
fax: (509) 754-0239

GRANT COUNTY BOARD OF COMMISSIONERS
Grant County, Washington

Resolution No. 01-172-CC
ORDINANCE NO. 01 -172 CC

**AN ORDINANCE FOR THE PURPOSE OF COORDINATING COUNTY,
FEDERAL AND STATE GOVERNMENT ACTIONS AFFECTING LAND
AND NATURAL RESOURCES USE IN GRANT COUNTY**

WHEREAS, Grant County has an interest in securing and promoting the public peace, general welfare, health and safety of the citizens of Grant County through preservation of their custom, culture, and economic stability, protection and use of their environment, and endorsement of their private property rights; and

WHEREAS, Grant County has an interest in providing a basis and process for determining how federal and state agencies are to coordinate and consult with Grant County in actions affecting land and natural resources, in order that the citizens of Grant County may preserve their customs, culture, and economic stability, and protect and use their land and natural resources; and

WHEREAS, preservation of the custom, culture, and economic stability of the citizens, and the protection and use of their environment, are inseparably tied to their ability to be involved in determining any regulation of their rights to use and enjoy their unique lands and natural resources; and

WHEREAS, the Board of County Commissioners have determined that the provisions of the Washington State Growth Management Act ("GMA"), regulations promulgated thereunder, the GMA Planning Policies for Grant County, and the existing land use planning process followed by the County, collectively, have not sufficiently addressed the effects that actions by federal and state agencies may have on land and natural resources use in Grant County, and which the County may address as finances dictate; and

WHEREAS, actions taken by federal and state agencies without consultation and coordination with the County and which conflict with the Comprehensive Plan and other County laws, could interfere with and defeat the purposes and goals of the Comprehensive Plan and such laws, could fail to preserve the custom, culture, economic stability and environmental quality of the citizens, and could otherwise work to the detriment of the livelihood and well-being of the citizens of Grant County;

LAND AND NATURAL RESOURCES Page 1
USE IN GRANT COUNTY
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Attachment 2

WHEREAS, the validity of this Ordinance is based upon the rights of citizens granted by the Constitutions of the United States and the State of Washington, the authority of the County to protect and uphold such rights, and existing federal and state laws mandating that federal and state agencies consult and coordinate with local governments in actions affecting the use of land and natural resources; and,

WHEREAS, it is the desire and intent of the Board of Grant County Commissioners to interpret and enforce the Ordinance in such a manner that is consistent with the Constitutions of the United States and the State of Washington, and existing federal and state statutes; and

WHEREAS, this Ordinance shall be interpreted as providing no greater authority than the authority provided by the Constitutions of the United States and the State of Washington, existing federal and state statutes affecting use of land and natural resources, and laws of the State of Washington authorizing the actions of county governments; and

WHEREAS, this ordinance provides that any action that may be taken or authority that may be exercised by Grant County pursuant to the Ordinance or otherwise in accordance with law may be taken or exercised by the action of the Board of Grant County Commissioners.

WHEREAS, the Board of County Commissioners have taken action to set up committees and subcommittees as set forth in GCC 21.04.150; Now, Therefore,

BE IT HEREBY ORDAINED, by the Board of County Commissioners of Grant County:

1. That adoption of this Ordinance is required to secure and promote the public peace, general welfare, health and safety of the citizens of Grant County through preservation of their custom, culture, and economic stability, protection and use of their environment, and endorsement of their constitutionally protected private property rights; and

2. That a new title be added to the County Code, entitled "Title 21 – Coordinating Government Regulation" and that the initial chapter of such title be entitled "Chapter 21.04 – Coordinating Government Regulation of Land and Natural Resources Use;" and

3. That such new title shall contain the following:

TITLE 21

COORDINATING GOVERNMENT REGULATION

Chapters:

- 21.04 Coordinating Government Regulation of Land and Natural Resources Use

Chapter 21.04

COORDINATING GOVERNMENT REGULATION OF LAND AND NATURAL RESOURCES USE

Sections:

ARTICLE I. PRELIMINARY PROVISIONS

- 21.04.010 Purpose
21.04.020 Coordination with Growth Management Act and Comprehensive Plan
21.04.030 Validity Under Constitutional, Federal and State Law
21.04.040 Definitions

ARTICLE II. GENERAL GUIDANCE

- 21.04.50 General Guidance
21.04.55 Notice

ARTICLE III. SPECIFIC GUIDANCE

- 21.04.060 Agriculture
21.04.070 Timber and Wood Products
21.04.080 Cultural Resources, Recreation, Wildlife and Wilderness
21.04.090 Land Acquisition and Disposition
21.04.100 Water Resources
21.04.110 Clean Air
21.04.120 Mining and Minerals
21.04.130 Private Property Rights

ARTICLE IV. MONITORING AND ENFORCEMENT

- 21.04.140 General Authorization
- 21.04.150 Coordinating Committee and Subcommittees
- 21.04.160 Research and Data Collection
- 21.04.170 Enforcement
- 21.04.180 Invalidity.

ARTICLE I. PRELIMINARY PROVISIONS

21.04.010 Purpose. The purpose of this Ordinance is to establish as County law the basis and process for determining how federal and state agencies are to coordinate and consult with Grant County in actions affecting land and natural resources use, in order that the citizens of Grant County may preserve their customs, culture, and economic stability, and protect and use their environment. This Ordinance addresses federal and state agency regulation of land and natural resources use directly and is intended to be used as a positive guide for federal and state agencies in their development and implementation of regulations affecting land and natural resources use in Grant County.

21.04.020 Coordination With Growth Management Act, Comprehensive Plan and Existing County Law.

- A. The provisions of this Ordinance shall be in addition to and, to the extent permitted by law, coordinated with the final Grant County Comprehensive Plan adopted pursuant to the Washington State Growth Management Act. The effectiveness of this Ordinance, however, shall not depend upon the Comprehensive Plan or the authority of the County to adopt such a plan.
- B. This Ordinance shall be coordinated with existing and future County ordinances, resolutions, policies and plans. It is intended as a set of provisions that shall provide a general framework as well as specific guidance and shall work in conjunction with other County ordinances, resolution policies and plans. In the event this Ordinance conflicts with such other ordinances, resolutions, policies and plans, the provisions of this Ordinance shall be given effect to the fullest extent possible.

21.04.030 Effectiveness: Validity Under Constitutional, Federal and State Law.

- A. This Ordinance shall be effective upon adoption by the Board of County Commissioners.

- B. The validity of this Ordinance is based upon the rights of citizens granted by the Constitutions of the United States and the State of Washington, the authority of the County to protect and uphold such rights, and existing federal and state laws mandating that federal and state agencies consult and coordinate with local governments in actions affecting use of land and natural resources. If any provision of this Ordinance shall be found invalid or unenforceable by a court of competent jurisdiction, the remaining provisions shall not be affected thereby, but shall remain in full force and effect, and to that extent the provisions of this Ordinance shall be severable.

21.04.040 Definitions.

For the purpose of this Ordinance, and any regulations promulgated hereunder, the following words shall be defined as follows:

- A. "Action," when used with respect to any federal or state agency, shall have the broadest possible meaning in the context of any exercise of authority, and shall include, without limitation, any proposal, policy, regulation, rule, consideration, finding, study, or gathering or review of data, that may lead to any substantive rule, regulation or administrative action or determination.
- B. "Federal agency," "state agency" or any combination thereof, shall mean each department, agency, commission or other instrumentality receiving its authority from the executive, legislative or judicial branch of the United States or the State of Washington respectively, including without limitation independent regulatory agencies and public corporations, together with each officer, agent or employee thereof in the performance of official duties.
- C. "Private property" shall mean all property protected by the Fifth and Fourteenth Amendments to the United States Constitution.

ARTICLE II. GENERAL GUIDANCE

21.04.050 General Guidance. To the fullest extent required or permitted by law, including this Ordinance, all federal and state agencies shall in all actions considered, proposed or taken, that affect or have the potential of affecting the use of land or natural resources within Grant County:

- A. consider the effects such actions have on (i) community stability, (ii) maintenance of custom, culture and economic stability, and (iii) conservation and use of the environment and natural resources, as part of the action taken;
- B. coordinate procedures to the fullest extent possible with the County, on an equal basis and not with the County as subordinate, prior to and during the taking of any federal or state action;
- C. meet with the County to establish, through a memorandum of understanding or otherwise, the process for such coordination, including joint planning, joint environmental research and data collection, joint hearings, and joint environmental assessments;
- D. submit a list and description of alternatives in light of possible conflicts with the County's laws, policies and plans, including the Comprehensive Plan; consider reconciling the proposed action with the County's laws, policies, and plans, including the Comprehensive Plan; and after such consideration, take all practical measures to resolve such conflict and display the results of such consideration in appropriate documentation;
- E. not, in any environmental impact statement or otherwise, assume that any proposed actions would be consistent with County conditions or would have a non-significant impact, without coordination and consultation with the County and review of data specific to the County;
- F. in absence of a direct constitutional conflict, coordinate with the County so as to comply with federal and state statutes and regulations, and County laws, policies and plans, including the Comprehensive Plan;
- G. take appropriate mitigation measures adopted with the concurrence of the County to mitigate adequately adverse impacts on culture, custom, economic stability or protection and use of the environment; and
- H. not violate through regulatory means or otherwise any private property rights of citizens of Grant County.

21.04.055 Notice. Compliance with any provision of the Ordinance by any federal or state agency shall be required only after specific notice by the Board of Grant County Commissioners to such agency that its actions are not in compliance with the Ordinance.

ARTICLE III. SPECIFIC GUIDANCE

21.04.060 Agriculture and Livestock. The custom and culture associated with agricultural and livestock production in Grant County is significant to the economic stability, livelihood and well-being of its citizens and protection and use of their environment. The purpose of this section is to provide clear guidance to federal and state agencies when actions taken by such entities affect or have the potential of affecting agricultural and livestock production in Grant County.

- A. In general, since the regulation of any aspect of agricultural and livestock production may impact the ability of County citizens to use land and use and conserve natural resources for agricultural and livestock purposes, all federal and state agencies shall (i) notify the County of proposed actions, (ii) provide a detailed statement assessing the specific effects on the custom, culture, economy and environment of Grant County, (iii) consider all alternatives to the taking of such actions, and (iv) to the extent permitted by law, take appropriate mitigation measures adopted with the concurrence of the County.
- B. To the extent permitted by law, federal and state agencies shall avoid taking actions that are inconsistent with the Grant County Right to Farm/Mineral Resource Land Protection Provisions, Chapter 23.04.040 of the Grant County Unified Development Code, enacted on October 1, 2000, or any successor resolution, ordinance or like provision in the Comprehensive Plan, without the concurrence of the County.
- C. To the extent permitted by law, federal and state agencies shall avoid taking actions that have the effect of obstructing, or making financially inefficient, agricultural and livestock production within Grant County.
- D. To the extent permitted by law, federal and state agencies shall give adequate consideration to the designation and use of lands as agricultural lands in the Comprehensive Plan and as otherwise consistent with the custom, culture, and economy of Grant County.

21.04.070 Timber and Wood Products. The custom and culture associated with timber and wood products production in Grant County is significant to the economic stability, livelihood and well-being of its citizens and protection and use of their environment. The purpose of this section is to provide clear guidance to federal and state agencies when actions taken by such entities may affect timber and wood products production in Grant County.

- A. All federal and state agencies shall prior to initiating, studying or taking any action affecting timber or wood products production in Grant County (i) notify the

County of proposed actions, (ii) provide a detailed statement assessing the specific effects on custom, culture, economy and environment of Grant County, (iii) consider all alternatives to the taking of such actions, and (iv) to the extent permitted by law, take appropriate mitigation measures adopted with the concurrence of the County.

- B. To the extent permitted by law, federal and state agencies shall avoid taking actions that reduce opportunities for a timber and wood products industry to be continued at levels consistent with the custom, culture and economy of Grant County.
- C. The production of timber from sources in Washington, Oregon and Idaho has been and continues to be an important part in the preservation of custom, culture and economic stability and protection and use of the environment of Grant County. The provisions of this section shall therefore apply fully to actions taken by federal and state agencies with respect to sources of timber in such states.

21.04.080 Cultural Resources, Recreation, and Wildlife. The custom and culture associated with cultural resources, recreation, and wildlife in Grant County are significant to the livelihood and well-being of its citizens and protection and use of their environment. It is the continuing policy of Grant County to (i) assure for all citizens safe, healthful, productive and aesthetically and culturally pleasing surroundings, (ii) preserve important historic, cultural and natural aspects of our County heritage, and (iii) maintain whenever possible an environment which supports diversity and variety of individual choice. The purpose of this section is to provide clear guidance to federal and state agencies when actions by such agencies may affect cultural resources, recreation, and wildlife in Grant County.

- A. Before any action is considered, proposed or taken' affecting cultural resources, recreational, or wildlife uses in Grant County, federal and state agencies shall (i) notify the County of any proposed action, (H) provide a detailed statement assessing the specific effects on custom, culture, economy and environment of Grant County, including, without limitation, public health and safety, (iii) consider all alternatives to the taking of such actions, and (iv) to the extent permitted by law, take appropriate mitigation measures adopted with the concurrence of the County.
- B. Federal and state agencies shall avoid taking actions affecting recreational, cultural, and wildlife opportunities within Grant County that are incompatible with local custom, culture and economic stability or preservation and use of the environment, or that otherwise fail to protect private property rights and local determination.

- C. In connection with any action related to sensitive, threatened or endangered plant or animal species, a federal or state agency shall:
- (i) At the earliest possible time, give actual notice to Grant County of the intent to consider or propose a species for listing, or to change or propose critical habitat;
 - (ii) Base the listing of a species on the best scientific and commercial data relating specifically to Grant County and not generalized over a wider geographic area;
 - (iii) List a species as threatened or endangered only after taking into account the efforts of Grant County to conserve the species;
 - (iv) Only implement a recovery plan if it will provide for conservation of a species;
 - (v) In designating critical habitat, base the designation on the best scientific data available and, after taking into consideration economic impacts, exclude as critical habitat all impacted areas unless, based upon the best scientific and commercial data available, failure to designate would result in extinction of the species;
 - (vi) Complete and forward to Grant County in a timely manner all documentation required by law when designating critical habitat;
 - (vii) Consider and directly respond to comments submitted by Grant County,
 - (viii) Not develop protective regulations or recovery plans if a Grant County plan is in place to protect effectively the species within Grant County,
 - (ix) Protect the species through alternatives with the least impact on the custom, culture and economic stability and preservation and use of the environment of Grant County, and
 - (x) To the extent permitted by law, take appropriate mitigation measures adopted with the concurrence of the County to mitigate adequately any impact on custom, culture, economic stability, and protection and use of the environment including any impact on public use and access and private property rights.

21.04.090 Land Acquisition and Disposition. Land is significant to the preservation of custom, culture and economy, and preservation and use of the environment and natural resources. In addition, land provides much of the tax base for vital public functions, such as funding of public schools and administration of county government. When land (including any interest in land) is acquired or held in trust by federal and state agencies, it may be removed from this tax base and the citizens of Grant County may suffer as a result. For these reasons, it is the policy of Grant County that the design and development of a federal and state land acquisitions, including by forfeiture, donation, purchase, eminent domain or trust, and disposals, including adjustments and exchanges, be carried out to the benefit of the citizens of Grant County.

- A. To the extent permitted by law, federal and state agencies shall prior To acquiring any lands or interest in lands within Grant County (i) notify the County of proposed acquisitions, (ii) provide a detailed statement assessing the specific effects on the custom, culture, economy and environment of Grant County, (iii) consider all alternatives to the taking of such actions, and (iv) to the extent permitted by law, take appropriate mitigation measures, such as payments in lieu of taxes, adopted with the concurrence of the County.
- B. Before any federal or state agency pursues any disposition, adjustment, or exchange of land within Grant County, the County shall be notified of, consulted about, and otherwise involved in all federal and state land dispositions, adjustments, and exchanges.

21.04.100 Water Resource. Grant County recognizes that the conservation and development of water resources are essential to preservation of the custom, culture and economic stability of its citizens; and protection and use of their environment. To the extent permitted by law, federal and state agencies shall avoid taking actions affecting water rights and water resources that are incompatible with local custom, culture and economic liability or preservation and use of the environment, or that otherwise fail to protect private property rights and local determination.

- A. Any federal or state action that has or could have the effect of changing existing water rights or water uses within the County shall be critically considered in relationship to the historic and current use of water in the County by humans, vegetation, livestock and wildlife. It is the intent of the County to assist federal and state agencies in the planning and management of the County's natural, cultural economic and environmental resources related to water use. Since the regulation of any aspect of water rights or water use may impact the ability of County citizens to use land and natural resources, all federal and state agencies shall, when taking any action related to restricting or limiting water use or water rights (i) notify the County of proposed actions, (ii) provide a detailed statement

assessing the specific effects on the custom, culture, economy and environment of Grant County, (iii) consider all alternatives to the taking of such actions, and (iv) to the extent permitted by law, take appropriate mitigation measures adopted with the concurrence of the County.

- B. Any proposed definition of wetlands, any action affecting the management of river flows or the sources or uses of irrigation, and any other federal or state action that has any effect on water rights or water uses within the County (i) shall be coordinated with the County, (ii) to the extent permitted by law, shall comply with all County water use plans and (iii) shall not violate any water rights.
- C. To the extent permitted by law, Grant County shall have the authority to define and designate wetlands, and to the extent such authority is exercised, and otherwise in accordance with law, federal and state agencies shall act in compliance with acceptance and enforcement of such definitions and designations. In addition, the County may continue to develop, in coordination with private land owners and governmental agencies, water management plans that encompass water resources on both governmentally owned and privately owned lands.
- D. To the extent permitted by law, Grant County shall have the authority to establish development regulations for point source and non-point source water pollution. To the extent such authority is exercised, and otherwise in accordance with law, federal and state agencies shall be subject to, and shall comply with all administrative requirements, controls, processes, and sanctions of such development regulations.
- E. The use of water that originates from sources outside Grant County has been and continues to be an important part in the preservation of custom, culture and economic stability and the protection and use of the environment of Grant County. The provisions of this section shall therefore apply fully to actions taken by federal and state agencies in any jurisdiction that affect water rights and water uses within Grant County.
- F. Before any federal or state agency acquires or agrees to acquire any interest in water rights in Grant County, directly, indirectly or in trust, for any purpose (including for transfer to or use in any other jurisdiction), by donation, purchase, condemnation or otherwise, such agency shall fully comply with all provisions of this Ordinance. In addition, federal and state agencies shall not acquire for any public purpose any interest in water rights within Grant County without (i) first

coordinating and consulting with the County; and (ii) ensuring that private water rights are protected.

21.04.110 Clean Air. Grant County recognizes that the conservation and use of clean air resources are significant to preservation of the custom, culture and economic stability of its citizens and protection and use of their environment.

- A. All federal and state agencies shall prior to taking any action affecting air usage within Grant County (i) notify the County of the proposed action, (ii) provide a detailed statement assessing the specific effects on the custom, culture, economy and environment of Grant County, (iii) consider all alternatives to the taking of such action, and (iv) to the extent permitted by law, take appropriate mitigation measures adopted with the concurrence of the County.
- B. Any federal or state action that has or could have the effect of changing existing use of air resources within the County shall be critically considered in relationship to the historic and current use of air resources in the County by humans, vegetation, livestock and wildlife. Any proposed designation of federal or state pollution non-attainment areas and any other federal or state action that has any effect on air resources within Grant County shall be coordinated with the County and shall comply with all County air quality standards and use plans.
- C. It is the intent of the County to assist federal and state agencies in the planning and management of the County's natural, cultural, economic and environmental resources related to air quality. Grant County shall have the authority to establish development regulations regarding air pollution and develop air quality protections plans of its own design. To the extent such authority is exercised, federal and state agencies shall act in compliance with acceptance and enforcement of such regulations, to the extent permitted by law. In addition, the County shall have the authority to continue to develop, in coordination with private land holders and governmental agencies, air quality management plans that encompass clean air resources throughout Grant County. To the extent such authority is exercised and otherwise as permitted by law, federal and state agencies shall be subject to, and shall comply with, all administrative requirements, controls, processes, and sanctions of such regulations and plans.

21.04.120 Mining and Minerals. Grant County recognizes that the conservation and use of mining and mineral resources are significant to preservation of the custom, culture and economic stability of its citizens and protection and use of their environment.

- A. Any federal or state action that has or could have the effect of changing existing use of mining or mineral resources within the County shall be critically considered in relationship to the historic and current use of such resources in the County.
- B. It is the intent of the County to act within the existing legal framework concerning planning and management of the County's natural, cultural, economic and environmental resources related to mining and minerals.

21.04.130 Private Property Rights. Grant County recognizes that the protection of private property rights is essential to preservation of the custom, culture and economic stability of its citizens and protection and use of their environment. Federal and state agencies shall fully comply with all case law, statutes, regulations, rules, and guidelines concerning protection of private property rights in Grant County, including, without limitation (i) United States Executive Order 12630, *Governmental Actions and Interferences With Constitutionally Protected Property Rights*, dated March 16, 1988, and (ii) Section 18 of the Washington Growth Management Act, Protection of Private Property (RCW 36.70A.370), and guidelines of the Attorney General of the State of Washington promulgated with respect thereto.

- A. All private property and private property rights of Grant County citizens shall be fully protected under the Fifth and Fourteenth Amendments of the United States Constitution and the United States Civil Rights Act, as amended, and this Ordinance.
- B. The violation of the private property rights of any Grant County citizen by any federal or state agency shall be deemed to be a violation of this Ordinance and liability for such violation shall be on the federal or state agency as well as on the federal or state official or employee responsible for making any decision or implementing any action which results in such violation.

ARTICLE V. MONITORING AND ENFORCEMENT

21.04.140. General Authorization. Grant County shall have the authority to develop and maintain monitoring and compliance standards to evaluate and enforce compliance by federal and state agencies with the provisions of this Ordinance, the Comprehensive Plan, and other ordinances, resolutions, policies and plans of Grant County. Any actions that may be taken or authority that may be exercised by Grant County pursuant to this Ordinance or otherwise in accordance with law, may be taken or exercised by action of the Grant County Board of Commissioners. The County may by resolution of the Board of Commissioners exempt any action or area of action by a federal or state agency from compliance with this Ordinance.

21.04.150 Coordinating Committee and Subcommittees. A basic premise of this Ordinance is that involvement by citizens is crucial to the preservation of their custom, culture and economic stability and protection and use of their environment This is particularly true with respect to coordinating government regulation of land and natural resources use,

- A. In order to involve citizens in the monitoring and enforcement of compliance with the provisions of this Ordinance, there shall hereby be established the Grant County Coordinating Committee for Federal and State Actions Affecting Land and Natural Resources Use (the "Coordinating Committee"), and the subcommittees thereof named below. The basic function of the Coordinating Committee and the subcommittees shall be to monitor federal and state actions and advise the Board of County Commissioners regarding compliance by such agencies with this Ordinance. The Coordinating Committee and the subcommittees shall be advisory only and shall in no way bind the Board of County Commissioners, who shall have final authority regarding interpretation and enforcement of this Ordinance.
- B. The members of the Coordinating Committee shall be the chair and vice chair of the following subcommittees, each of which shall have the chair, vice-chair, members, and specific duties designated by the Board of County Commissioners from time to time in furtherance of this Ordinance (i) Agriculture and Livestock, (ii) Timber and Wood Products, (iii) Cultural Resources, Recreation, and Wildlife, (iv) Land Acquisition and Disposition/ Mining and Minerals, (y) Water Resources, (vi) Clean Air, and (vii) Research and Data Collection. In furtherance of this Ordinance, the Board of County Commissioners may by resolution (i) expand or contract the number of members of the Coordinating Committee and any subcommittee, or On change the subcommittees or establish other subcommittees.
- C. The Board of County Commissioners shall appoint on the first Monday of each year, or as soon thereafter as practical, the chair, vice chair and other members of each subcommittee. Members of the Coordinating Committee and each subcommittee must be citizens of Grant County. over the age of 18 years, with terms of appointment as follows: Initially, members shall be appointed for one, two or three year terms; thereafter, terms shall be for a period of three years, staggered so that the terms of one-third of the members expire each year. Any person may be re-appointed at the pleasure of the Board of County Commissioners. The Board of County Commissioners may remove any person from a chair, vice chair or membership position for cause and may fill vacancies as needed from time to time.

- D. At its initial meeting, the Coordinating Committee shall adopt operational procedures for itself and the subcommittees, which, along with any later amendments thereto, shall be subject to the approval of the Board of County Commissioners. To the extent required by law, the Coordinating Committee and subcommittees shall be subject to the Open Public Meetings Act (RCW 42.30) and the Public Disclosure Act (Chapter 42.17 RCW).
- E. When determining which citizens shall be appointed, the Board of County Commissioners shall consider the purpose of this Ordinance and the functions each subcommittee and the Coordinating Committee shall perform. While no specific criteria must be met, appointments should collectively reflect an expertise and involvement in the primary subject matter, and the broad diversity of the many aspects of the culture, custom, economy and environment of Grant County.

21.04.160. Research and Data Collection. In furtherance of the purposes of this Ordinance, it is the interest of the County to develop and maintain a research data base of information regarding the custom, culture, economy and environment of Grant County.

21.04.170 Enforcement.

- A. The Board of County Commissioners shall have the authority to request the Prosecuting Attorney to bring an action to enforce this Ordinance in any court or administrative tribunal of competent jurisdiction and to seek cumulative remedies, including any criminal or civil penalties allowed by law, equitable relief, and monetary compensation when the County tax base or the general welfare or health and safety of the citizens of the County is at issue.
- B. Nothing in this Ordinance shall be construed to limit any remedy that any person may have under the laws of the State of Washington or of the United States. Every person, who under color of any law, statute, ordinance, regulation, custom or usage, of the United States or of the State of Washington, subjects, or causes to be subjected, any person within Grant County to the deprivation of any property rights secured by this Ordinance shall be liable to the person injured in an action, at law, suit in equity or other proper proceeding for redress.
- C. Any person alleging a violation of the private property rights protected by this Ordinance may, after exhausting all other state and federal remedies, submit a written complaint to the Prosecuting Attorney, who may in his or her discretion determine whether any criminal action may be brought.

- D. Every person, who under color of law, statute, ordinance, regulation, or custom, willfully subjects any person within Grant County to the deprivation of any property rights secured or protected by this Ordinance shall be guilty of a misdemeanor punishable by not more than thirty (30) days in jail, a fine of not more than \$500, or both.
- E. A recommendation for enforcement against any federal or state agency and/or its employees in any particular instance shall be taken by resolution of the Board of County Commissioners only if such enforcement is based upon both the Ordinance and an existing federal or state statute applying to the actions of such agency.

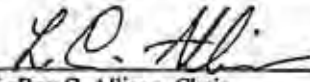
21.04.180 Invalidity.

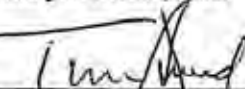
If any provision of this Ordinance shall be found invalid or unenforceable by a court of competent jurisdiction, the remaining provision shall not be affected thereby, but shall remain in full force and effect, and to that extent the provisions of this Ordinance shall be severable.

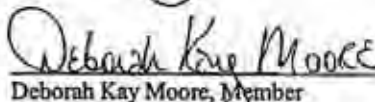
NOW THEREFORE, BE IT HEREBY RESOLVED THAT THE GRANT COUNTY COMMISSIONERS adopt this ordinance effective November 1, 2001.

PASSED this 23rd day of October, 2001.

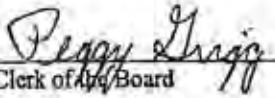
BOARD OF COUNTY COMMISSIONERS
GRANT COUNTY, WASHINGTON


LeRoy C. Allison, Chair


Tim Sneed, Member


Deborah Kay Moore, Member

ATTEST:


Clerk of the Board

PUBLISHED: 1 1

COMMENT SL 08

From: "Lee Blackwell" <lbdirect@gemsi.com>
To: "Jim Blanchard" <jblanchard@pn.usbr.gov>
Date: 4/10/03 1:24PM
Subject: Banks Lake Drawdown

10 April 2003

Dear Mr. Blanchard:

The Grant County Board of Board, its Health Officer and its employees, as well as the Grant County Commissioners and the mayors and councilpersons of most Grant County cities & towns, are deeply concerned by what we see as an ill-advised action to draw-down the water of Banks Lake to a critical level.

Our main emphasis in issuing this objection to the drawn-down, agreed to unanimously by the board, is that it creates the potential for another medical alert, just as the West Nile Virus is reaching our state. Specifically Eastern Washington. As you know, birds and mosquitoes are primary carriers of the virus.

By lowering the lake to the proposed level there will be created pockets of water left to stagnate and become breeding pockets, leading to contacts of the virus carriers with humans. Such contacts have led to deaths. We feel that the proposed level is irresponsible action, if executed.

Additionally at this time health providers, and specifically health districts whose functions are mandated services, are grossly under-budgeted for all the reasons of which you and I are aware. Asking the Health District of Grant County to expend financial resources to combat the negative impact of this inappropriate draw-down is considered a major problem.

When doing so we will basically be requested to ignore other county health issues due to resource constraints, most noticeably tuberculosis. Grant County has 25% higher incidences of TB then the next highest (King County).

With all of this being said as chair of the Grant County Health District, as well as the Mayor, City of Moses Lake, I personally find the action incomprehensible!

Yours,

Lee Blackwell, Chair
Grant County Board of Health

Cc: GC BofH members

CC: "Patty Anderson" <PANDERSON@ep.co.grant.wa.us>, "Brzezny, Alex L." <BrzeznyA@columbiaba
sinhospital.org>

01

COMMENT SL 09

GRANT COUNTY PORT DISTRICT NO. 4

P.O. BOX 537
COULEE CITY, WA 99115

April 3, 2003

COMMISSIONERS:

G. McDONALD

D. JORDAN

J. STARKEY

TELEPHONE

(509) 632-5681

Mr. Jim Blanchard
Bureau of Reclamation
P O Box 815
Ephrata WA 98823

RE: Banks Lake Drawdown Draft Environmental Impact Statement

Dear Mr. Blanchard:

The Port District # 4 of Grant County in Coulee City would like to go on record opposing the ten-foot draw down of Banks Lake.

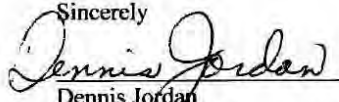
This Port District owns and operates 26 boat slips on the south end of Banks Lake, next to the Coulee City Community Park, where people from all over the state moor their boats. Should Banks Lake drop the proposed ten feet, the boat docks will be rendered useless.

It has taken all of the 19 years the boat docks have been there to fill those boat slips and although there is currently a waiting list, the Port District foresees many problems. Not only will the Port District loose those currently renting boat slips/docks, but also there will be a drastic disinterest in future renting and the waiting list will become non-existent.

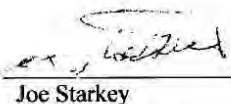
The effects of this 10' draw down will be felt not only with the inability to moor boats, but the lack of access to launch boats during the busiest time of the entire year. It is a sad state of affairs when a minority of fish take precedence over the life style, recreation and needs of human beings.

Grant County Port District # 4 rejects the ten foot draw down. The welfare of the citizen of the Banks Lake area and those who have invested in this area depend on your support of this Community.

Sincerely

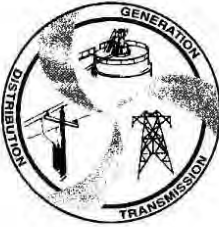

Dennis Jordan
Port District # 4 Commissioners


Gene McDonald


Joe Starkey

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COMMENT SL 10**PUBLIC UTILITY DISTRICT NO. 2 OF GRANT COUNTY***MEETING OUR CUSTOMER ENERGY NEEDS IN A COST CONSCIOUS MANNER.*P.O. BOX 878 • EPHRATA, WASHINGTON 98823 • 509/754-0500
April 7, 2003

Mr. Jim Blanchard, Special Projects Officer
Bureau of Reclamation
32 C Street
P.O. Box 815
Ephrata, WA 98823-0815

Dear Mr. Blanchard:

Grant PUD is submitting these comments in response to your Draft EIS for the Banks Lake Drawdown.

Grant PUD agrees with the findings in your EIS that the proposed drawdown of Banks Lake in August will have adverse effects, especially on the recreational related aspects of our local economy but also on the power related aspects. With regard to the power related effects, any water storage capacity provides needed flexibility and reliability in the hydropower system. Many interests in our area feel the impacts, including those on power and recreation, are understated in your EIS.

Given those impacts, Grant PUD questions any positive benefits from the proposed action. First, the proposed action is assumed to provide fisheries benefits by increasing flows in the Columbia River at McNary Dam. These benefits are taken on faith in the EIS since the proposed action is a reasonable and prudent action in a Federal Biological Opinion. Grant PUD is on record in numerous federal and state proceedings questioning the assumed survival benefits from solely increasing flows during the migration season for Columbia River fisheries.

However, without restating all Grant PUD (and many others) concerns about flow augmentation and survival benefits, your EIS fails to prove that the proposed action of Banks Lake drawdown provides measurable flow improvements in real time during the month of August in the lower Columbia River.

Your EIS deals with an average monthly water budget of an additional 127,600 acre-feet, which distributed over a theoretical flat flow at McNary Dam in August provides some calculated flow increases. This is misleading since any creature migrating in the Columbia River deals with real time flow changes and has no way of perceiving assumed average monthly changes.

The Columbia River is managed on at least an hourly basis with flow changes vastly greater than any change your proposed 1% to 2% average monthly water budget change could provide. Therefore the only reasonable way to provide insight into what, if any, a 1% to 2% average monthly increase in water volume would do to hourly and daily flows

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at McNary is to route such a water budget through an hourly flow model for the Columbia River. Your EIS fails to provide such insight and without that it seems unreasonable to assume the impacts to our local area are justified.

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Even without such modeling to determine real affects, our own water managers find it hard to believe any resulting increases in flows in real time from the proposed change at McNary Dam could have any measurable affect. Again, keeping in mind that Grant PUD is on record questioning the biological benefits of flow increases if such increases exist.

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Thank you for the opportunity to comment on your draft EIS and we are hopeful that our comments will result in a better analysis of the real benefits of this proposed action as weighted against the real adverse impacts.

Sincerely,



Vera Claussen, President
Grant County PUD Board of Commissioners

C: Grant County Commissioners
Quincy Columbia Basin Irrigation District
South Columbia Basin Irrigation District
East Columbia Basin Irrigation District
Black Sands Irrigation District
Columbia Basin Development League
D. Robert Lohn, Regional Administrator, NOAA Fisheries
Bill McDonald, Regional Director, USBR Boise

COMMENT SL 11

SOUTH BANKS LAKE MOSQUITO CONTROL DISTRICT #3

Mr. Jim Blanchard
Bureau of Reclamation
P O Box 815
Ephrata WA 98823

P.O. BOX 776
COULEE CITY, WA 99115
TELEPHONE (509) 632-5497

March 3, 2003

RE: Banks Lake Drawdown Draft Environmental Impact Statement

Dear Mr. Blanchard:

With the potential draw down of Bank Lake by ten feet, the Banks Lake Mosquito District # 3 of Grant County takes this opportunity to voice it's concern and opposition.

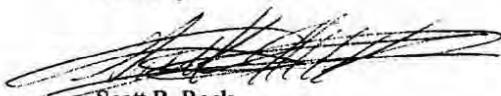
On any 'normal' year, Coulee City and the surrounding area fights a constant battle with the mosquito problem. Citizens of this town pay hundreds of dollars in tax monies to keep the Mosquito District active in combating this problem. However, with this potential draw down, the mosquito population will become enormous, overwhelmingly so. The increased acreage available to the mosquitoes with the draw down and the inability to access this area for spraying will find Coulee City and the surrounding areas inundated with mosquitoes.

With the added cases of the West Nile Virus in and around the Pacific Northwest Area, this draw down with its increased swamp and wet lands will only aide in and assist the spread of this disease.

It is incredulous to expect this small Banks Lake Mosquito District to be forced in to or even expected to have to buy additional equipment, hire on additional labor and increase the tax assessment of the local population in order to combat the mosquito increase all due to the draw down of Bank Lake by ten feet at the risk of human lives.

The Banks Lake Mosquito District # 3 of Grant County respectfully requests rejecting the 10' draw down and serious consideration regarding any draw down due to the ramifications this decision will have on the Banks Lake Area.

Sincerely

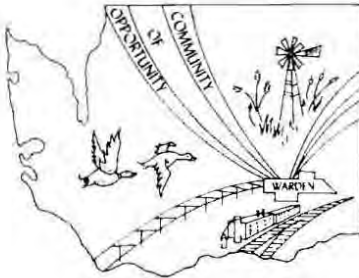


Scott R. Rock
Chairman
Mosquito District # 3

01

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COMMENT SL 12



City of Warden

509-349-2326 Fax 509-349-2027
201 S. Ash St.
WARDEN, WASHINGTON 98857

Mr. James Blanchard -Special Projects Officer
Bureau of Reclamation
PO Box 815
Ephrata, WA 98823

March 14, 2003

Dear Mr. Blanchard:

This is a formal document, to register my opposition to the action alternative of the ten-foot drawdown of Banks Lake. This drawdown will destroy the fishing in Banks Lake and make public access difficult, if not impossible. There are numerous errors in the Draft Environmental Impact Statement.

The Washington Department of Fish and Wildlife website states that 2002 Salmon returns are high, with an above average projection for 2003. Puget Sound Chum salmon are back with the highest numbers ever. All this occurred with out a Banks Lake drawdown. The five month tourism season is essential for area business survival. Many citizens, whose existence depends on the summer tourist revenue, will be impacted to point of insolvency.

The Draft Environmental Impact Statement states the "impacts on the economy of Grant County are negligible", but no data is submitted to support this statement. In averaging the impact at the county level, you minimize the impact not only on the number of individual small businesses that would be devastated by one season of less than average seasonal income, but also the loss of jobs and tax revenue so urgently needed in our rural area. With the state budget deficit, fewer dollars are available for local assistance. The Dept of Fish & Wildlife proposes to close the Ephrata office. That office interacts with several hundred thousand tourists annually. Washington's small business climate is already foundering under increased regulations and a higher minimum wage than they can support. Does it make sense to propose an action in the hopes of saving a few fish, and knowingly close several small businesses? The multiplier effect of losing those businesses will be felt throughout the county. According to Washington State County 2001 Travel Impacts, Eastern Washington employment directly generated by travel spending is 32.3% of the total jobs. Local tax revenues directly generated by travel spending are \$28 million, and state taxes of \$116 million. Grant County alone generates \$126.3 million from travel spending. Any loss of this hard-earned and cultivated income would certainly have more than a "negligible" effect on the county's citizens and funded programs. Northern Grant County has little in the source of revenue other than tourism.

The Draft EIS suggests that the drawdown should not impact the local economy as "there are many close substitutes for recreation on Banks Lake." Highway 17 is a recognized Tourism Corridor by the WA-DOT. Unmarked and unknown alternative destinations, will leave many established business entities such as Coulee City Community Park and Sunbanks Resort literally "high and dry," as they cannot transfer their operations to these "close substitutes." Coulee City especially, would suffer most in lost revenue, and like other small cities in eastern Washington, Coulee City already suffers from severe economic strain for its continued existence.

This draft EIS, casually discounts the impacts of this actions, with no supporting evidence. If this drawdown occurs, it will expose acres of stagnant water and mud flats. This is the perfect breeding habitat for mosquitoes, and the West Nile Virus. The Center for Disease Control predicts this disease entry into Washington. Its victims will be people and birds, and there are numerous endangered/threatened bird species in the Banks Lake ecosystem. Should this occur, The Bureau of Reclamation may find itself in violation of the Endangered Species Act. I urge you to cancel this proposed drawdown.

Sincerely,

Richard E. Keeney-Mayor

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COMMENT SL 13



DISTRICT NO. 8
P. O. BOX 841
WARDEN, WASHINGTON 98857
(509) 349-2480

February 19, 2003

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
PO Box 815
Ephrata, WA 98823

RE: Comment on Banks Lake Drawdown DEIS

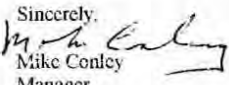
Dear Jim,

The Commissioners of the Port of Warden want to go on record opposing the action alternative of the 10' drawdown of Banks Lake for the following reasons:

1. It will jeopardize the reliable water supply for the Columbia Basin Project, the lifeblood of our agriculture economy for Central Washington.
2. The exposure of additional mud flats and stagnant water ponds will increase the breeding grounds for mosquitoes. With the threat of the West Nile Virus coming to Washington State this year we should not encourage this potential health problem.
3. The serious negative impacts to the recreation industry in North Grant County will impact the total county, which already has many problems.
4. Additional water in the Columbia River in late summer does not assist the ESA listed fish (Spring Chinook & Steelhead) which are not present during that time frame.
5. The Northwest Power Planning Council has gone on record questioning if increased flows assist anadromous fish runs. Where is the science on this question & what assistance will this small amount of water do to aid fish.

We feel the risk to our local economy is far greater than what little benefit will be gained for the listed fish populations. We have had excellent runs of all fish in the Columbia the last several years, what is to be gained by the Banks Lake drawdown to further expand these runs?

Sincerely,


Mike Conley
Manager

CC: Mr. Bob Lohn – NMFS Regional Administrator
7600 Sand Point Way NE
Seattle, WA 98115-0070

Mr. J. William McDonald – Regional Director
USBR – Pacific NW Region
1150 N. Curtis Road
Boise, Idaho 83706

01

Irrigation Districts — ID

COMMENT ID 01

EAST COLUMBIA BASIN IRRIGATION DISTRICT
P.O. Box E - 55 North 8th Avenue
Othello, WA 99134 (509) 488-9571

SOUTH COLUMBIA BASIN IRRIGATION DISTRICT
P.O. Box 1006 - 1138 E. Hillsboro, Suite A
Pasco, WA 99301 (509) 547-1735

QUINCY-COLUMBIA BASIN IRRIGATION DISTRICT
P.O. Box 188 - USBR Building
Quincy, WA 98848 (509) 787-3591

January 29, 2003

Mr. J. William McDonald, Regional Director
US Bureau of Reclamation
1150 North Curtis Road, Suite 100
Boise, ID 83706

RE: Banks Lake Drawdown DEIS

Dear Mr. McDonald:

At the January 27, 2003 regular semi-annual meeting of the Columbia Basin Project Reserved Works Committee, the Directors unanimously adopted a motion requesting Reclamation to extend the written comment period for the Banks Lake Drawdown Draft Environmental Impact Statement an additional 60 days. Presently, the deadline for written comments is March 10, 2003. A 60-day extension would result in a revised deadline of about May 9, 2003.

Since the enactment of the 2000 FCRPS Biological Opinion the CBP Districts have consistently urged Reclamation to make every effort to meet the deadlines set forth in that biop for those action items relevant to the Columbia Basin Project. This request is, in the opinion of the Districts, a justifiable exception to that general position.

The original target date for public release of the referenced DEIS was mid-summer of 2002. That date was slipped by Reclamation several times last year and actual public release was not until January 6, 2003. That delayed release date has caught the Districts at a difficult time period for management workload requirements. The deadline extension is requested to better enable the Districts to prepare and submit comprehensive and meaningful comments about this important CBP operational decision.

As we've told you and other Reclamation officials, the Districts are retaining a team of scientists and consulting engineers to assist the managers in the preparation of comments about the DEIS. Consultant selection for that work was carried out last summer consistent with Reclamation's earlier schedules for release of the DEIS. However, final contractual arrangements could not be completed with the consultants until the DEIS was available which wasn't until January 6th. Unfortunately, during the time lapse from consultant selection to January 6th some of the selected consultants became unavailable for this work and the Districts are scrambling to rearrange the consulting team. As a result that work can't start until sometime in February. The DEIS is a complex, voluminous and technical document. The Districts feel that credible scientific and engineering peer review by experts other than those employed by Reclamation is in the best interests of the CBP.

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Mr. J. William McDonald
January 29, 2003
Page 2

At the present time the managers are engaged in several other extended issues of a regulatory and/or environmental nature. These other activities are also important to the CBP and have a similar timeline to the present DEIS schedule. This further complicates our ability to deal with the DEIS between now and March 10th. Those activities include:

- Grant County PUD's Priest Rapids/Wanapum FERC relicensing and the related proposal to enhance Lower Crab Creek for fish and wildlife purposes. The District managers will be involved in this activity through at least February.
- Updating the Washington Department of Ecology NPDES permit for the application of aquatic herbicides for 2003. This requirement is the result of the Talent case decision and the immediate deadline for this year's work is February.
- WDOE rule making for revisions to the State's water quality standards. This activity culminating several years of proposals by the State has a March 7 deadline and it is important that the Districts stay involved.
- WDOE rule making for revisions to the Referendum 38 program. This activity also has an early March deadline.
- The NWPPC draft mainstem amendment process is scheduled to reach a conclusion in mid-March. The Districts' involvement in this is probably about completed but significant time was spent on this activity through January further complicating our ability to start a review of the DEIS.
- WDOE's Director has requested the District's to become involved in Governor Locke's Columbia River Regional Initiative. One of the study processes for that activity kicks off next week.

The Districts realize we are not alone in having a full plate at this time. However, the long awaited release of the DEIS has caught us at a particularly difficult time and we request your favorable consideration of a 60 day extension.

Sincerely,



Richard L. Erickson
Secretary
CBP Reserved Works Committee

cc: Bill Gray
Eric Glover
QCBID
SCBID
GCPHA
Tom Pitts

02

COMMENT ID 02

EAST COLUMBIA BASIN IRRIGATION DISTRICT

55 North 8th
P.O. Box E

OTHELLO, WASHINGTON 99344

Phone 509 488 9671
Fax 509 488 6433

April 10, 2003

Mr. Jim Blanchard, Special Projects Officer
U.S. Bureau of Reclamation
P.O. Box 815
Ephrata, WA 98823

RE: Banks Lake Drawdown, Draft Environmental Impact Statement, January 2003

- Enclosure (1) "Review of Draft Environmental Impact Statement On The Proposed Banks Lake Drawdown" by Tetra Tech FW, Inc. (formerly Foster Wheeler Environmental Corporation), April 2003
- Enclosure (2) March 28, 2000 Bureau of Reclamation letter by Deputy Area Manager William D. Gray re: 2000 – 2004 Diversion Rate, Columbia Basin Project
- Enclosure (3) July 15, 1983 Bureau of Reclamation memorandum by Grand Coulee Project Manager R.E. Ethridge re: Proposed Operating Plan for Banks Lake and Grand Coulee Pumping/Generating Plant

Dear Mr. Blanchard:

Thank you for the opportunity to review the referenced DEIS.

The East District is opposed to both the 5 ft. drawdown, the supposed No Action Alternative, as it has been implemented to date and even more opposed to the 10 ft. drawdown, the Action Alternative. The basis for this opposition can be expressed for the following general reasons, with supporting data to follow:

- Selection of the alternatives appears to be arbitrary, or at least inadequately explained, in the DEIS.
- The No-Action Alternative is, in fact, an action alternative.
- Benefits to ESA listed anadromous fish (and also non-listed anadromous fish) are not demonstrated in the DEIS, even though this is the purpose of the proposed action(s).
- The geographic scope of the resource impact assessments of the DEIS are not consistent.
- The cumulative hydrologic effects of the proposed action(s) do not show the relative contribution of Banks Lake.
- The impacts to resident fish in Banks Lake of the proposed action(s) are underestimated.

Mr. Jim Blanchard
April 10, 2003
Page 2

- The impacts to the FCRPS hydropower capacity at Grand Coulee Dam, particularly peaking power ability related to the GCD Pump/Generator Plant are either not addressed or underestimated.
- The impacts of the proposed action(s) will diminish established economic and social benefits of the Columbia Basin Project with no assurance of off-Project ESA/environmental benefits.
- The proposed action(s) will introduce a further element of risk to the late season Columbia Basin Project irrigation water supply, albeit small, with no assurance of off-Project ESA/environmental benefits.

Enclosures (1), (2) and (3) are submitted as documentation in support of the above stated positions of the East District. In particular, Enclosure (1) is submitted to Reclamation in its entirety as a portion of the East District's comments to the referenced DEIS. That report, "Review of Draft Environmental Impact Statement On The Proposed Banks Lake Drawdown", April 2003, was prepared for the East, Quincy and South Columbia Basin Irrigation Districts and the Grand Coulee Project Hydroelectric Authority by Tetra Tech FW, Inc. Until recently that consulting firm was known as Foster Wheeler Environmental Corporation. Primary authors of that report are Mr. Thomas Martin, P.E. and Mr. John A. Knutzen, Aquatic Scientist. Your attention is directed to Attachment A of that report, "Lower Columbia River Modeled Salmonid Survival and Water Velocities Under Proposed Banks Lake August Drawdown Scenarios" by Chris Van Holmes and Dr. James Anderson, March 17, 2003. Dr. Anderson and Mr. Van Holmes are with Columbia Basin Research and are well experienced and widely accepted in mainstream modeling. This East District comment letter will only quote or reference portions of the Tetra Tech – Foster Wheeler report but reading the report and its attachments, in their entirety, is necessary to fully comprehend the deficiencies of the DEIS.

01

Enclosures (2) and (3) are Reclamation documents, portions of which will be referred to regarding hydropower peaking ability losses associated with the proposed action(s).

- Selection of the alternative appears to be arbitrary, or at least inadequately explained, in the DEIS.

02

While the DEIS discusses several scenarios related to the timing of accomplishing 5 ft. and 10 ft. drawdowns as well as similar timing scenarios for refill following the drawdown(s), it does not discuss or evaluate how the drawdown levels of 5 ft. and 10 ft. were selected. Were these quantified based on desired flow augmentation or fish survival outcomes at McNary Dam or below? That appears unlikely considering that the most aggressive drawdown scenario presented in the DEIS is estimated to increase flows at McNary by 7923 cfs (10 ft., early draft) doesn't sufficiently exceed the DEIS's flow uncertainty factor of 5000 cfs.

Were these drawdown levels quantified based on acceptable risk to late season CBP irrigation water supplies? Were these quantified based on acceptable impacts to FCRPS hydropower at Grand Coulee Dam, i.e. peaking ability and/or to District hydropower at Dry Falls Dam? Or, are the 5 ft. and 10 ft. drawdown levels the result of negotiation or bartering between the federal parties during the Section 7 consultation?

Mr. Jim Blanchard
 April 10, 2003
 Page 3

It doesn't appear likely that these drawdown levels were quantified based on minimizing the adverse impact(s) to Banks Lake itself and the immediate surrounding area. If that were the case, drawdown actions of less than 5 ft. and less than 10 ft. would have been selected. The discussions in Chapters 3 and 4 of the DEIS give ample support that lesser drawdown levels would have significantly lesser impacts to resident fish, recreation and Banks Lake area economies and communities.

02

If Reclamation proceeds to a final EIS and a record of decision, much more consideration and justification is needed regarding the selection of the appropriate drawdown levels for consideration.

- The No-Action Alternative is, in fact, an action alternative.

03

The FCRPS Biological Opinion RPA 23 and the No Action Alternative of the DEIS propose an August drawdown of Banks Lake by 5 feet to elevation 1565. This is, in fact, a federal action. Refer to Figure 2 of Appendix C of the DEIS, Hydrologic Report, and Enclosure (1) (page ES-2, pages 2, 3 and 42) which demonstrate that up to 2000 Banks Lake elevations in August exceeded 1565 about 95% of the time and exceeded 1568.5 about 80% of the time. The DEIS does describe the hydropower load following operation typically employed at the GCD P/G Plant. Enclosure (2) provides a detailed description of the load following operation. However, that operation rarely drops the reservoir to 1565 with elevations over the past 20 or so years usually being at 1568 or higher (See Figure 4, DEIS Appendix C). Also refer to page 3 of Enclosure (3) and page 42 of Enclosure (1) which discuss the need for Banks Lake to be above 1567.5 and 1568.5 (respectively) to enable operation of the P/G units at GCD.

It should also be noted that the hydropower load following operation typical of the past 20 years creates a weekly reservoir level cycle of about 2 ft. The proposed No Action Alternative results in a monthly reservoir cycle of 5 ft. (possibly a 6 or 7 week cycle when refill time is added on). Section 5 of Enclosure (1) which discusses resident fish issues indicates that the longer duration of this cycle will likely be significant for resident fish and their food chain. The East District does not challenge Reclamation's authority to operate Banks Lake at 1565. However, Reclamation and NOAA Fisheries are in error by implementing RPA 23 without some level of environmental analysis since historical operations have been well above that level and the drawdown cycle has been of shorter duration. If Reclamation proceeds to a final EIS and a record of decision this deficiency needs to be overcome either by further justification that 5 ft. is not a federal action or by adding a true no action scenario.

- Benefits to ESA listed anadromous fish (and also non-listed anadromous fish) are not demonstrated in the DEIS, even though this is the purpose of the proposed action(s).

04

Reclamation has consistently stated throughout this study process that questions about the benefits of increased flows at McNary Dam for juvenile salmon survival are beyond the scope of the Bureau's duties and the only meaningful measure is Columbia River hydrology at McNary. The DEIS estimates that the 10 ft. drawdown will make it more likely to meet that 195 kcfs or 200 kcfs flow target only about 1 more year out of every 50 years. Even if all were to accept the relationship that this will improve salmon survival on that infrequent schedule,

Mr. Jim Blanchard
April 10, 2003
Page 4

does it justify the adverse economic and social impacts to Banks Lake communities in 50 years out of 50 years?

04

Enclosure (1) evaluates both the hydrology and hydraulics at McNary, and elsewhere, related to the various Banks Lake drawdown scenarios. Just as importantly, Enclosure (1) and its Attachment A estimate the resulting changes in juvenile fish survival. The East District contends that by omitting an analysis of the anadromous fish benefits, the DEIS is seriously flawed.

05

Enclosure (1) utilizes the CRISP model to evaluate juvenile salmon survival benefits that should be expected from the proposed action(s). "The model results indicate that the effect on fish survival would be infinitesimal" (page ES-2). "A Banks Lake drawdown of 10 ft. from the early, late or uniform drawdown periods over August would increase the number of smolts reaching Bonneville Dam by between 6 to 13 smolts out of the total of 630,000" (pages 22 and A-5).

06

Few, if any, of these 6 to 13 juvenile fish would be Snake River fall chinook, the ESA listed species intended to benefit by the proposed action(s). "Over 90 percent of all sub yearling chinook salmon have passed McNary Dam by July 31. The same holds true for Snake River fall chinook salmon. Based on similar data, over 88 percent of the in-river migrants have passed Lower Monumental Dam by July 31" (page 22, also see Figures 3-6 and 3-7).

07

Enclosure (1) also evaluates water particle travel time and river velocity which are sometimes used as indicators of migration times for juvenile salmon. Attachment A uses the CRISP model for these estimates. "The corresponding reduction in travel time between McNary and Bonneville Dams is at most one hour on a 9 day travel time." (page A-5). "But where effects were estimated the reduction was typically about 14 minutes of travel time in this reach out of a total travel time of an estimated 8 to 9 days" (pages ES-3 and 22).

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Section 4 of Enclosure (1) uses hydraulic analyses to make similar estimates. "The approximate residence time through the three lower Columbia River reservoirs at 200,000 cfs is about 224.7 hours (see Table 4-2). With the maximum flow augmentation from Banks Lake, the approximate residence time would be about 216.1 hours..." (page 32). "With the maximum Banks Lake flow augmentation of 72923 cfs, the velocity increase at the 100,000 cfs and 318,000 cfs levels would be less than 0.05 fps..." (page 31).

Section 3 of Enclosure (1) discusses recent and current trends regarding Columbia River flow augmentation and its relationship to juvenile salmon survival. "Giorgi et al (1997) did not find a relationship between flow and migration rate in the middle Columbia River" (page 5). From the Independent Science Advisory Board (ISAB 2003): "The prevailing flow-augmentation paradigm, which asserts that in-river smolt survival will be proportionately enhanced by any amount of water, is no longer supportable. It does not agree with information now available" (page 6). "Prior to the ISAB review, another major review evaluated the effects of flow augmentation, among other factors, affecting survival (Giorgi, et al. 2002)" (page 8). "Much of the information in the ISAB report was derived from a summary document prepared by Giorgi, et al. (2002)" (page 7).

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Besides studies beginning to question the efficacy of flow augmentation, it is now becoming a regional policy question. "the Northwest Power Planning Council (NPPC) in October 2002 developed new plans for the operation of the Federal Columbia River Power System (FCRPS) that are not based on attempts to meet the NMFS-directed goal of 200 thousand cubic feet per second (kcfs) at McNary Dam in July and August (NPPC 2002). The meeting of the flow target for August was the main reason that flows developed by RPAs 23 and 31 were included in the draft EIS. Specifically, the NPPC stated on page 30 of the Draft Mainstem Amendments to the Columbia River Basin Fish and Wildlife Program that "The Council does not support the NMFS 2000 BIOP spring and summer flow target due to lack of evidence that they are related to survival within the range of the operating agencies' control given reservoir and other system constraints." This position by the NPPC, a major regional planning agency, supports the need for greater detail in the EIS concerning the predicted effects to the resource of primary interest, anadromous fish of the Columbia River." (page 4)

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If Reclamation proceeds to a final EIS and a record of decision the benefits for ESA listed anadromous fish should be evaluated (biologically and/or hydrologically) and measured against the impacts at Banks Lake to hydropower, irrigation, recreation, resident fish, economies and communities. This evaluation should also consider current views and trends in both the science and policy related to flow augmentation. The East District realizes that RPAs 23 and 31 were conceived prior to 2000, during a previous federal administration, when flow augmentation was in vogue. Those times may be passing.

- The geographic scope of the resource impact assessments of the DEIS are not consistent.

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"The draft EIS is inconsistent in its treatment of the scope of the impacts. For the economic analysis, the area includes Grant County and the Federal Columbia River Power System (FCRPS) and five Public Utility Districts' hydro powerplants, but the fisheries analysis is limited to Banks Lake. The fisheries and water resources analyses should include the entire affected environment, which includes the lower Columbia River. There is no section in the "Affected Environment Chapter" of the draft EIS that describes water resources, and no section on the impacts to water resources, other than water quality in Banks Lake. A hydrologic report appears in Appendix C of the draft EIS, but it is not referenced in the main body of the document. Any EIS should address the resources that would likely be affected, either positively or negatively, regardless of their geographical location." (Enclosure (1), page ES-2)

If Reclamation proceeds to a final EIS and a record of decision these inconsistencies need to be corrected or at least the basis for the variations needs to be explained.

- The cumulative hydrologic effects of the proposed action(s) do not show the relative contribution of Banks Lake.

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The DEIS makes the following statement: "While individually not significant in the overall flow of the Columbia River, the contribution to that flow by Banks Lake water, coupled with water from other sources, makes it possible to meet flow targets a majority of years" (page 4-45). However, the DEIS fails to demonstrate this contribution or to evaluate it comparatively.

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"There should be some quantification of the flow augmentation contribution of the other RPAs and a comparison to the Banks Lake contribution. In the draft EIS, Reclamation simply refers to the Banks Lake drawdown as a small but important piece of the total flow augmentation plan for the Columbia-Snake River system.

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The CRISP model results showed the increase in fish survival in lower Columbia River due to Banks Lake flow augmentation relative to the cumulative effects of all of the flow augmentation RPAs implemented according to the 2000 BIOP. The model did not analyze the pre-2000-BIOP (no-action) conditions. A complete cumulative effects analysis would compare fish survival resulting from implementation of all other flow augmentation to that of implementing only the proposed Banks Lake drawdowns.

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Furthermore, a complete analysis should show how the effects change farther downstream. By the time flow reaches the estuary, additional flow has entered the Columbia River from the John Day, Deschutes, Willametta and other rivers below Bonneville Dam, so that the relative contribution of any flow from Banks Lake would be diluted." (Enclosure (1) page ES-4).

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The East District feels this cumulative effects comparison is important given the complexity of mainstem operations so that a true evaluation of mainstem benefits vs. Banks Lake impacts can be made. The DEIS assumes a 5000 cfs uncertainty factor at McNary relative to the 200,000 cfs flow target. The maximum proposed contribution by Banks Lake is 7923 cfs, not hugely different than the uncertainty factor. How does 7923 cfs compare to other flow augmentation actions in the upper Snake, the Clearwater or in Montana? Will operations elsewhere simply offset the Banks Lake contribution thus making the local impacts be all for nothing?

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This cumulative effects analysis should also consider the Northwest Power Planning Council's proposed Mainstem Amendments. This comparison is done by Foster-Wheeler in Enclosure (1), Section 3.2.4, pages 9-15. Figures 3-1 and 3-2 on page 10 compare Banks Lake to Biop flows and the figures 3-3 and 3-4 on page 13 compare the NPPC proposal to Biop flows. The NPPC proposed changes are for the most part larger and in a contrary direction to the proposed Banks Lake action(s). "During the months of July and the first half of August under the average flow, the NPPC flows are lower than the BIOP flows by about 5,000 to 18,000 cfs (Figure 3-5). Even during low flow, the NPPC reduces flows in July and the first half of August by 18,000 cfs, but increases the flows in the second half of August by about 9,000 cfs. These reductions are in contrast to the expected average monthly contribution of about 2,100 to 4,200 cfs from Banks Lake under uniform drawdown (only about 2,100 cfs maximum over the BIOP because it already includes the flow from the first 5 feet of drawdown)" (page 12).

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If Reclamation proceeds to a final EIS and a record of decision additional cumulative effects analysis needs to be included. Again, given that RPAs 23 and 31 were developed some time ago, this cumulative effects evaluation needs to question whether this proposed minor addition to flow augmentation is still timely, especially in view of the direction in which NPPC appears to be moving.

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- The impacts of the proposed action(s) to resident fish in Banks Lake are underestimated.

On page ES-5 and in Section 5, pages 35-42, Enclosure (1) critiques the coverage of resident fish in the DEIS, including some inconsistencies between the Fish and Wildlife Coordination Act Report (Appendix A, DEIS) and the main body of the DEIS. Foster Wheeler concludes that the DEIS may be underestimating the impacts to resident fish in Banks Lake. A conclusion they reach is that the duration of the drawdown is a critical factor regarding resident fish and their food chain. The shorter the duration, the smaller the impact.

If Reclamation proceeds to a final EIS and a record of decision some reconsideration should be given to the analysis of impacts to resident fish. Also, shorter drawdown durations should be considered.

- The impacts to the FCRPS hydropower capacity at Grand Coulee Dam, particularly peaking power ability related to the Pump/Generator Plant are either not addressed or underestimated.

The DEIS in Chapters 3 and 4 does discuss the operation of the GCD P/G Plant, the FCRPS hydropower impacts, the mid-Columbia PUDs' Columbia River hydroplants and the CBP Districts' hydroelectric plant at Dry Falls Dam. The Chapter 3 discussion includes an explanation of the load following and peaking power operations at the P/G Plant. However, it appears that there is no analysis in Chapter 4 of the impacts to this peaking ability that would occur due to the proposed action(s).

It would appear that some diminishment of peaking ability will occur with both a 5 ft. or a 10 ft. drawdown. This peaking ability is an important asset to the FCRPS and the entire region.

Enclosure (3) was written by Reclamation in 1983 at about the time the 6 P/G units at GCD were being transferred to O&M status when the pumpback storage features and peaking ability were first being implemented. Page 3 of that document indicates a Banks Lake elevation of 1568.5 +/- 0.5' is necessary to generate with the P/G units. Enclosure (2) was written by Reclamation in January 2000 at a time when the P/G operations, load following operations and peaking capacity functions had matured. The "Discussion" portion of that document describes the value of the P/G plant's 900-mw load swing capability. Also described is the eight-fold increase in pump and P/G units starts and stops that have become necessary due to load following and peaking power operations. Enclosure (1) approximately confirms the Banks Lake level required for P/G unit generation with 1567.5 being the current bottom limit (page 42).

Load following can probably continue with either the 5 ft. or 10 ft. drawdowns. However, it appears that peaking ability will be diminished by 300 mw for either scenario due to the loss of P/G unit generation.

If Reclamation proceeds to a final EIS and a record of decision this diminishment in peaking power capacity needs to be evaluated both economically and operationally. Also, the DEIS's approach to evaluating hydropower impacts on the basis of the cost of purchasing replacement power needs to include some assurance that replacement power will be available, or have a contingency plan in the event it isn't. 2001 was only two years ago and replacement power was in very limited supply.

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- The impacts of the proposed action(s) will diminish established economic and social benefits of the Columbia Basin Project with little or no assurance of off-Project ESA/environmental benefits.

Pages 4-27 through 4-33 of the DEIS describes the likely impacts of the proposed action(s) to Banks Lake area recreation, Banks Lake area businesses and to Banks Lake area communities. The loss of 10 of 12 boat launches for a 10 ft. drawdown, the dewatering of the navigation channels at Coulee City and Devil's Punch Bowl, the loss of the swimming beaches at Steamboat Rock and Coulee City, the dewatering of Osborne Bay and all the other resulting mud flats and bathtub ring will make Banks Lake unattractive to many visitors during the drawdown and refill periods. This resulting unattractiveness may extend over a longer period if potential visitors don't understand the true duration of the affected period. All of August and part of September is bad enough and blacks out a peak recreation period.

The DEIS somewhat callously glosses over the likely impacts to individual Banks Lake area businesses and communities by stating that "the overall economic impact on the Grant County economy is expected to be negligible. In 1999, Grant County's economy provided over 38,000 jobs and more than \$900 million in earnings to workers." (page 4-30). That statement may be true but will be of little comfort to those individuals suffering the immediate impact. No doubt similar rationalizations have been used at other rural areas sacrificed to ESA such as Forks, Washington, Orofino, Idaho and Klamath Falls, Oregon.

Considering the small ESA benefit, 6 to 13 additional smolt surviving their migration through the lower Columbia, is this economic and community impact to the Banks Lake area justifiable? The Columbia Basin Project is authorized as a multiple purpose project and it has achieved a wide range of benefits. While the East District's fundamental interest is the irrigation purpose of CBP, the District and its waterusers benefit from all of CBP's multiple purposes. It appears that Reclamation is proposing to sacrifice a portion of the established CBP benefits in the Banks Lake area for infinitesimal ESA benefits elsewhere.

If Reclamation proceeds to a final EIS and a record of decision some consideration should be given to mitigating economic, recreational and community losses in the Banks Lake area. Also, if Reclamation finds itself compelled by superior federal authority to carry out some type of Banks Lake drawdown scenario, revision of the proposed action(s) may be appropriate. Referring to Figures 3-2 and 3-3 of the DEIS, it appears that Banks Lake elevations above 1562 will keep the Steamboat Rock and Coulee City boat launches usable which should tend to lessen negative recreation and economic impacts and also probably lessen impacts to resident fish. Alternate drawdown scenarios that stay above that level could be considered. Also, drawdown scenarios of shorter duration could be considered. Figures 3-6 and 3-7 and the associated explanatory text of Enclosure (1) (pages 14-15) demonstrate that the vast majority of in-river migrants have passed McNary Dam by July 31st and most of the remaining late migrants have passed by August 15. Drawdown scenarios limited to the first week or two of August would better fit the actual migration situation and would also lessen recreation, economic and resident fish impacts at Banks Lake. Another possible modification to any drawdown scenario could be to carry them out only in especially dry, low flow years.

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- The proposed action(s) will introduce a further element of risk to the late season Columbia Basin Project water supply, albeit small, with little or no assurance of off-Project ESA/environmental benefits.

The proposed 10 ft. drawdown would leave Banks Lake about 2/3 full at some point in August which amounts to about 1/5 of a season's irrigation supply. In a typical year about 1/6 of the season's supply is delivered during September and October. Another 1/6 is typically delivered during August. Whether the proposed 10 ft. drawdown threatens the reliability of late season irrigation supplies for CBP depends on when during August the drawdown is accomplished and how soon after August pumping and refill resumes. The pumps and pump/generators at Grand Coulee clearly have the capacity to catch up if they are allowed to pump and if they don't suffer any catastrophic breakdowns.

But let's remember the recent record. In 2000, a late summer fire in Grand Coulee's left powerhouse idled the P/G Plant for a period of time and then left it with diminished capacity for the balance of the season. In 2001, a cascade of electrical and mechanical breakdowns in the P/G Plant left us with only 25% of normal pumping capacity for an extended period. If it weren't for that being the season that the BPA irrigation buyback followed 15% of the Project there would have been a serious drawdown, well over 10 ft., that year. Then in 2002, when refill following the 5 ft. drawdown was supposed to happen beginning Labor Day weekend, Reclamation and the Biop's Technical Advisory Team independently decided to leave Banks Lake down 5 feet for September too to accomplish certain Montana reservoir operations. The past 3 years don't inspire much trust or confidence.

Another concern of the East District is the established track record in the northwest of ESA requirements being systematically and incrementally ratcheted in their severity, through both subsequent Section 7 consultations and third party lawsuits. The East District recalls that several years ago only a 5 ft. Banks Lake drawdown was being proposed. Now a 10 ft. drawdown is being studied. Where will this end?

If Reclamation proceeds to a final EIS and a record of decision the proposed action(s) should be conditioned such that the extent and duration of any drawdown will be modified to recognize any existing or foreseeable pumping limitations at Grand Coulee. Also, it should be an absolute constraint that refill will take place immediately following any drawdown, regardless of circumstances elsewhere in the FCRPS, or elsewhere in the Columbia River system.

• Conclusion

In conclusion, the East District strongly recommends that Reclamation not proceed to a final EIS and that it issue a record of decision, or other appropriate notice, at this time rejecting both the No Action and Action Alternatives and that Banks Lake operations will revert to the pre-2000 norm. Such a decision is appropriate given the information gathered to date, specifically that the local Banks Lake adverse impacts identified in Reclamation's DEIS are severe compared to the infinitesimal ESA/environmental benefits identified by Enclosure (1).

Such a decision will have the effect of completing or terminating RPAs 23 and 31 of the 2000 FCRPS Biological Opinion. That action is supportable by the information gathered to date.

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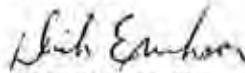
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The East District is prepared and willing to support Reclamation, to the extent we are able, in implementing and defending such a decision.

Finally, the East District recognizes that infrequent drawdowns of Banks Lake for maintenance or construction purposes will continue to be necessary. The last one was in 1994. The DEIS does provide important information to better manage future drawdowns of that type. Those need to be planned well in advance and coordinated to simultaneously satisfy all foreseeable maintenance and construction needs in order to keep drawdowns as infrequent as possible.

Thank you for your consideration.

Sincerely,



Richard L. Erickson
Secretary-Manager

RLE:jd

Enclosures

cc: Directors
Attorney
SCBID
QCBID
GCPHA

REVIEW OF DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE PROPOSED BANKS LAKE DRAWDOWN

Prepared for

**East Columbia Basin Irrigation District
Quincy-Columbia Basin Irrigation District
South Columbia Basin Irrigation District
Grand Coulee Project Hydroelectric Authority**

Prepared by



TETRA TECH FW, INC.

April 2003



EXECUTIVE SUMMARY

On behalf of the East, South, and Quincy-Columbia Basin Irrigation Districts and the Grand Coulee Project Hydroelectric Authority (the Districts), Tetra Tech FW, Inc. (TtFW) reviewed and prepared comments on the Draft Environmental Impact Statement on the proposed Banks Lake Drawdown (draft EIS), which was prepared by the U.S. Bureau of Reclamation (Reclamation) in January 2003. The review focuses on the fish and flow issues related to the Proposed Action, which is the Reasonable and Prudent Alternative Action 31 (RPA 31) of the Biological Opinion (BIOP) for the Federal Columbia River Power System issued in December 2000 (NMFS 2000a). RPA 31 recommends study of an additional 5-foot drawdown of the lake level below the 1,565-foot level, which is 10 feet below full pool, during August.

A briefing on the main themes emphasized in the review comments is included in this Executive Summary. The Districts are concerned that the proposed 10-foot drawdown is certain to create adverse environmental and economic impacts, but is not certain to create any benefits. There are five main themes identified in this review:

- The No-Action Alternative is an action, and is different than current operations.
- Benefits to anadromous fish in the lower Columbia River were not demonstrated.
- The geographic scope of the resource impact assessments were inconsistent.
- The cumulative effects did not show the relative contribution of Banks Lake.
- Impacts to resident fish in Banks Lake were underestimated.

Issues related to each of the five main themes are summarized below. Because the draft EIS did not demonstrate benefits to fish in the lower Columbia River that could result from Banks Lake flow augmentation, an analysis of the potential benefits was conducted for this review using the CRiSP model. The model computed fish survival in the lower Columbia River for the 2000 BIOP. This scenario represented the baseline condition to which the various Banks Lake flow augmentation scenarios were compared. It is important to note that drawdown of the upper 5 feet of Banks Lake during August is included in the 2000 BIOP; therefore, the effects of this action, and all other flow augmentation RPAs implemented according to the 2000 BIOP, are included in the baseline condition. No other issues were further analyzed for this review, except to compare CRiSP-computed water velocities with actual measurements.

EXECUTIVE SUMMARY (CONTINUED)

No-Action Alternative

Reclamation considered the No-Action Alternative to be the 5-foot drawdown of Banks Lake, which was proposed under RPA 23 of the 2000 BIOP. The operation of Banks Lake under the No-Action Alternative is different than pre-2002 operations. The No-Action Alternative is not a true representation of no action because, historically, the lake in August has been above 1,565 feet 95 percent of the time. There is no assessment of this normal condition.

Additionally, there is no discussion in the draft EIS for the rationale behind the selection of a 5- and 10- foot drawdown. Reclamation does not present a master manual for the operation of the lake in the draft EIS. If such a manual existed, it would have provided a clear description of the No-Action Alternative. The selection of the no-action and action drawdown levels appear to be arbitrary. An analysis of the impacts of a lesser drawdown would provide better resolution of the change in impacts with drawdown below historical levels.

Lower Columbia River Anadromous Fish

The draft EIS lacked a demonstration of effects of fish in the lower Columbia River that would be derived from flow augmentation provided by a Banks Lake drawdown. The area that was to have been positively affected was not addressed in the draft EIS. This area is the lower Columbia River (downstream of McNary Dam). Reclamation focused the draft EIS on the immediate area surrounding Banks Lake. As part of this review, the effects of flow augmentation from the 10-foot drawdown of Banks Lake on fish survival in the lower Columbia River were analyzed. The CRISP model was used for this analysis. The model results indicate that the effect on fish survival would be infinitesimal. Therefore, there is great uncertainty about the ability of the Proposed Action to achieve the intended benefit.

The following are the main points regarding the benefits of flow augmentation from a 10-foot drawdown of Banks Lake:

- The timing of the Banks Lake drawdown is such that most of the fish that would be intended to benefit from the flow augmentation would not be present in the lower Columbia River during the period of increased flows. The vast majority of the fish migrate through the lower Columbia River during June and July, but the drawdown would occur one month later, during August.

EXECUTIVE SUMMARY (CONTINUED)

- The benefits of any flow augmentation, in general, for the subyearling chinook salmon in the mid- and lower Columbia are in question based on recent analysis and interpretation of flow effects (ISAB 2003). The Independent Science Advisory Board (ISAB) (2003) stated that the assumption of proportional survival benefits of flow could not be supported. For subyearling chinook salmon in the mid-Columbia, ISAB indicated that no variable was found to correlate with migration speed. Additionally, ISAB did not believe that incremental flow as now mandated would result in "dramatic benefits" to inriver smolt survival.
- CRiSP model results indicate that none of the Banks Lake alternatives increase estimated subyearling chinook salmon survival, relative to the estimated survival of the 2000 BIOP, by more than 0.006 percent. This is an increase in estimated smolt survival of less than one fish for every 10,000 smolts beginning the migration.
- CRiSP model results indicate that fish travel time, another factor often considered important in survival, would not be affected at all in the reach between McNary Pool and Bonneville Dam for most simulations. But where effects were estimated, the reduction was typically about 14 minutes of travel time in this reach out of a total travel time of an estimated 6 to 9 days.
- The regional managers at the NPPC are considering flow changes, including deviations from the BIOP-recommended flows, that would be much greater than those proposed in the Banks Lake alternatives. These changes would result in reduced flow in the lower Columbia River reach during much of the period when juvenile subyearling chinook salmon would be migrating through this region, including part of August when Banks Lake flows are to be released. The current NPPC position is that these changes would be adequate to protect the anadromous endangered fish species of the Columbia River.

As part of this review, the impact of flow augmentation from Banks Lake drawdown on water particle travel time through the lower Columbia River was analyzed. The U.S. Geological Survey (USGS) computed discharge from measurements taken on the Columbia River downstream of The Dalles. Velocity measurements were comparable to the velocities computed by the CRiSP model, which verified the model estimates of velocity. Also, water particle travel time was estimated using reservoir data from the HEC-5Q model of the Columbia River. These estimates also verified the CRiSP model estimates of velocity and water particle travel time.

EXECUTIVE SUMMARY (CONTINUED)

Inconsistent Geographic Scope

The draft EIS is inconsistent in its treatment of the scope of the impacts. For the economic analysis, the area includes Grant County and the Federal Columbia River Power System (FCRPC) and five Public Utility Districts' hydro powerplants, but the fisheries analysis is limited to Banks Lake. The fisheries and water resources analyses should include the entire affected environment, which includes the lower Columbia River. There is no section in the "Affected Environment Chapter" of the draft EIS that describes water resources, and no section on the impacts to water resources, other than water quality in Banks Lake. A hydrologic report appears in Appendix C of the draft EIS, but it is not referenced in the main body of the document. Any EIS should address the resources that would likely be affected, either positively or negatively, regardless of their geographical location.

Cumulative Effects

There are two key issues related to cumulative effects: the contribution of Banks Lake to the total flow augmentation specified in the 2000 BIOP, and the latest ISAB opinion on the benefits of flow augmentation. As mentioned above, the ISAB has stated that the assumption of proportional survival benefits of flow could not be supported. The ISAB position obviously casts doubt on the usefulness of flow augmentation. Nevertheless, the other issue of relative contribution should have been addressed in greater detail in the draft EIS. There should be some quantification of the flow augmentation contribution of the other RPAs and a comparison to the Banks Lake contribution. In the draft EIS, Reclamation simply refers to the Banks Lake drawdown as a small but important piece of the total flow augmentation plan for the Columbia-Snake River system.

The CRISP model results showed the increase in fish survival in lower Columbia River due to Banks Lake flow augmentation relative to the cumulative effects of all of the flow augmentation RPAs implemented according to the 2000 BIOP. The model did not analyze the pre-2000-BIOP (no-action) conditions. A complete cumulative effects analysis would compare fish survival resulting from implementation of all other flow augmentation to that of implementing only the proposed Banks Lake drawdowns.

Furthermore, a complete analysis should show how the effects change farther downstream. By the time flow reaches the estuary, additional flow has entered the Columbia River from the John Day, Deschutes, Willamette and other rivers below Bonneville Dam, so that the relative contribution of any flow from Banks Lake would be diluted.

EXECUTIVE SUMMARY (CONTINUED)

Resident Fish

Resident fish and their associated habitat are one of the major resources that will be affected by the alternatives. In general, Reclamation describes the existing condition of a broad range of resources and potential impacts to these resources. However, it appears that the magnitude and risk of impacts to these resources may be more severe than characterized in the draft EIS. The main points of the review are noted below:

- The impacts that would result from the No-Action Alternative scenarios need to be discussed more fully. In several areas, the effects of these scenarios are not differentiated from historical operations (see Section 2 of this document).
- Some of the No-Action Alternative scenarios have the potential to adversely affect submergent and emergent vegetation compared to historical operations. These adverse effects would result from exposure of area where this vegetation grows from 21 to more than 30 days. This exposure would reduce any benefit to fish resources. Benthic resources, important as food for fish, would also be affected by "No-Actions," although at a lower level than would occur under the 10-foot drawdown associated with the Action Alternative scenarios.
- The Action Alternative scenarios pose a greater risk of adverse effects to lake fish resources. Some vegetation would be adversely affected, juvenile fish would be subjected to greater predation from a loss of habitat during a period of high-food demand, and the overall habitat area will be reduced, at least for the short term.
- The level of effects of the Action Alternatives on fish appears to be greater than noted in the draft EIS, as indicated by statements in the USFWS CAR report.
- Summary tables need to include the impacts of the No-Action Alternative scenarios as well as the Action Alternative scenarios.
- The proposed mitigation (e.g., studies of effects, use of hatchery, fish habitat enhancement) may not be adequate to offset impacts.

There is one final issue, which primarily relates to resident fish, but it also is important to other resources within Banks Lake. The issue is the duration of drawdown. The duration is directly proportional to the amount of impact. The draft EIS indicates a range of target dates for refilling the lake: from early September to late November. The impact of longer durations should be addressed in the final EIS.

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1. INTRODUCTION

This report is an independent third-party technical review of the Banks Lake Drawdown Draft Environmental Impact Statement (draft EIS), which was prepared by the U.S. Bureau of Reclamation (Reclamation) in January 2003. Tetra Tech FW, Inc. (TtFW) (formerly Foster Wheeler Environmental Corporation) was retained by the East Columbia Basin Irrigation District, Quincy-Columbia Basin Irrigation District, South Columbia Basin Irrigation District, and the Grand Coulee Project Hydroelectric Authority (the Districts) to conduct this review and to prepare this report. The review focuses on fish and flow issues related to the Proposed Action, which is Reasonable and Prudent Alternative Action 31 (RPA 31) of the Biological Opinion (BIOP) for the Federal Columbia River Power System issued in December 2000 (NMFS 2000a). RPA 31 recommends study of an additional 5-foot drawdown of the lake level below the 1,565-foot level, which is 10 feet below full pool, during August of each year.

Five categories of issues concerning the draft EIS are identified and discussed in Sections 2 through 6 of this report:

- Alternatives Development
- Anadromous Fish
- Water Particle Travel Time
- Resident Fish
- Other Issues

Section 3, "Anadromous Fish Issues," refers to an additional analysis, the results of which appear in Attachment A of this document.

Section 4, "Water Particle Travel Time Issues," includes an analysis in addition to comments on the draft EIS, in accordance with the contract scope of work.

The page numbers shown in italics in the following sections refer to page numbers of the draft EIS.

2. ALTERNATIVE DEVELOPMENT ISSUES

Page 1-1

The draft EIS states that "under current historical August operations, the reservoir may be lowered from its maximum elevation of 1,570 feet to a minimum elevation of 1,565 feet." However, on p. 2-1, it states that "Banks Lake has always been authorized to operate between full pool elevation of 1,570 feet and a minimum elevation of 1,545 feet at any time of the year." There is no clear information presented to indicate what operating manual or operating "instrument" would be modified by a new "decision" contemplated in the draft EIS. Given that Reclamation apparently has the authority to draw the reservoir down to as low as 1,545 feet, there is no information presented concerning why the recent change in operations that has Reclamation operate Banks Lake at an elevation 5 feet below full during August (RPA 23) (to elevation 1,565) is not considered an action in this EIS, but somehow the next 5 feet (to elevation 1,560) does constitute a federal action requiring an EIS.

Page 1-2

The Scope section states that the "area included in the draft EIS consists of the actual lake and its surrounding areas." This is not the same as the area affected by the Proposed Action. According to the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) guidance, an EIS should address the resources that would likely be affected, either positively or negatively, regardless of their geographic location. On page 3-34, under "Regional/Local Economy," Grant County was "selected as the affected area for this study." However, the lower Columbia River would clearly also have to be "affected" by the action and thus resources in that "area" should be described and the effects on those resources analyzed.

The bulleted list described as issues identified during scoping are not issues. It is instead a list of resource topics. The issues under each topical area need to be called out so one can see the connection to the alternatives and mitigation.

Page 1-5

RPA 23 of the BIOP specifically directs Reclamation to operate Banks Lake at an elevation 5 feet below full pool during August, but this very relevant activity is not mentioned or described in the "Other Related Actions and Activities" section of Chapter 1. The 2002 Water Management Plan specifically called for a summer draft of Banks Lake to elevation 1,565 feet by the end of August to provide more water for

summer flow augmentation (U.S. Army Corps of Engineers, Northwest Division, May 22, 2002).

Pages 2-1 to 2-8

While Banks Lake has often been drawn down to 1,565 feet, the proposed operating manner for which this level is being considered differs from what has occurred in the past (see Appendix C, Figures 2 through 5). Historically, the lake in August has been above 1,565 feet 95 percent of the time. In fact, the elevation has been within 1 foot of full pool 75 percent of the time (Appendix C, Figure 2). While the draft EIS indicates that operation to 1,565 feet is "normal" for August, the manner, frequency, and duration that the lake would be drawn down to this level all differ markedly from historical operations. While Reclamation does assess the effects of the No-Action and the Action Alternatives, it does not supply an alternative that is representative of historical operations. The No-Action Alternative appears to be based on the directive of the BIOP (NMFS 2000a). RPA 23 indicates that Reclamation would operate Banks Lake with the 5-foot drawdown as specified in the No-Action Alternative. RPA 23 was not noted in the Draft EIS as an action that Reclamation is taking to comply with the BIOP. While the inclusion of an additional alternative may not be required, such an alternative could help better define the range of options that could occur at Banks Lake, especially since drawing the reservoir down to just 1,565 feet does have potential adverse effects within the system (see comments below).

3. ANADROMOUS FISH ISSUES

The whole purpose of the actions being considered in the draft EIS is to benefit downstream anadromous fish stocks of the Snake and Columbia Rivers that are listed as threatened or endangered under the Endangered Species Act (ESA). However, Reclamation chose to not address the details and depth of the potential effects of the Proposed Action on these anadromous fish. Therefore, this section is provided primarily as a source of information to help Reclamation address this critical issue so that the analysis in the EIS will be more complete. In this section, we have provided: 1) a section addressing the NEPA requirements for this analysis, 2) the background of what the historical and current information indicates about the effects of flow on the stocks of interest, 3) the methods available to quantitatively assess these effects, 4) the current thinking about the need for flow in the river at this time, and 5) a state-of-the-art quantitative model estimate of the effects that Reclamation's actions would have on anadromous stocks.

3.1 NEPA AND BIOLOGICAL OPINION DIRECTIVES

One of the requirements of NEPA is to disclose the direct and indirect effects, both positive and negative, of a proposed action. Reclamation's NEPA Handbook (Reclamation 2000) states that "the analysis should be in sufficient detail to determine if any significant impacts would result from the action." The draft EIS does not achieve this requirement for fish resources, specifically anadromous fish resources in the Columbia River system. While there are topical references to the effects on these resources, the presentation should be greatly enhanced to meet NEPA requirements.

As stated in the draft EIS, the purpose of the Proposed Action is to meet the directive of RPA 31 in the NMFS BIOP. Since the whole purpose of this RPA is to benefit listed anadromous fish species, the benefits need to be fully disclosed to allow managers, as well as the public, to weigh all effects of the considered actions. Without supplying this information, as required under NEPA guidelines, the analysis is not complete.

The draft EIS does note that the proposed flow augmentation in August is to benefit primarily Snake River fall chinook salmon. It also states that there is some "uncertainty" surrounding the benefits for fish survival, but does not elaborate on these environmental effects. It does not attempt to quantify the "benefits" or explain the controversy in a more quantitative or more detailed qualitative manner than the two paragraphs supplied on page 4-18. One of the main purposes of NEPA is to "insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken" (40 CFR 1800 1(b)). This is especially important in light of information that has been developed since the RPAs were issued by NMFS. For example, the Northwest Power Planning Council (NPPC) in October 2002 developed new plans for the operation of the Federal Columbia River Power System (FCRPS) that are not based on attempts to meet the NMFS-directed goal of 200 thousand cubic feet per second (kcfs) at McNary Dam in July and August (NPPC 2002). The meeting of the flow target for August was the main reason that flows developed by RPAs 23 and 31 were included in the draft EIS. Specifically, the NPPC stated on page 30 of the Draft Mainstem Amendments to the Columbia River Basin Fish and Wildlife Program that "The Council does not support the NMFS 2000 BIOP spring and summer flow target due to lack of evidence that they are related to survival within the range of the operating agencies' control given reservoir and other system constraints." This position by the NPPC, a major regional planning agency, supports the need for greater detail in the EIS concerning the predicted effects to the resource of primary interest, anadromous fish of the Columbia River.

3.2 DOWNSTREAM FLOW EFFECTS ON ANADROMOUS STOCKS

There are varying and sometimes conflicting sources of information about the benefits to summer migrating subyearling chinook salmon from flow augmentation. The relevant information needs to be summarized in the EIS. Flow is often considered relative to its effects on water particle travel time through the river reservoirs. This parameter is often used as a measure of effects on migrating fish. The effects of the alternative flows on water particle travel time are presented in Section 4. While we have not attempted to develop a complete picture of the effects of flow on survival, we have provided a summary of the relevant information below. We hope Reclamation finds this of use in completing the Final EIS.

3.2.1 ORIGINAL RATIONALE FOR SUMMER FLOWS FOR SUBYEARLING CHINOOK SALMON

The main thinking behind the need for flows in the summer was discussed in the National Marine Fisheries Service (NMFS) white paper addressing flow effects on survival in the Columbia River basin (NMFS 2000b). The majority of the studies cited in the white paper address fall chinook salmon in the Snake River. NMFS noted several studies, particularly on Snake River passage, that found a significant correlation of the migration rate of fall chinook salmon with flow (Berggren and Filardo 1993, Berggren 1994). However, Giorgi et al. (1997) did not find a relationship between flow and migration rate in the middle Columbia River.

One of the characteristics of subyearling chinook salmon that affects the interpretation of results, especially those concerning flow, is the fact that, unlike yearling smolts, subyearlings are rearing in the systems, not just outmigrating. But many of the results concerning travel time and flow have been conflicting for subyearlings. In particular, the relationship of flow, water temperature, fish length, and release date have all correlated significantly at times with migration rate in both the mid-Columbia and Snake River. On the Snake River, turbidity also correlated with migration rate (Muir et al. 1999). But correlation among the variables makes it difficult to determine what specific parameter affects movement.

The question of survival followed somewhat similar patterns in the data reviewed. Generally, on an annual flow basis, in-river survival of fall chinook salmon in the Snake River increased with increased flow, decreased with increased temperature, and increased with increased turbidity. Again, correlation among the parameters made interpretation of the effects impossible. However, within-year survival correlations with flow (1995 to 1998) were less clear, although often significant with these same factors. Some data from

Priest Rapids suggested that there was a significant relationship between the number of returning adults of subyearling chinook salmon outmigrants and flow, but when the data were reanalyzed, they were not sufficient to draw this conclusion (Hilborn et al. 1993, Skalski et al. 1996). The result is that movement is affected not only by the physical conditions to which to which subyearlings are exposed but also by their state of development and readiness to migrate.

The review conducted by NMFS (2000b) in its white paper concluded: "Evidence for survival benefits to fall chinook salmon from flow management is supported by research results. Data sets consistently demonstrate strong relationships between flow and survival, and temperature and survival. Thus, with the existing project configuration and outmigration timing, additional flow augmentation to benefit Snake River fall chinook salmon would likely increase survival." However, as indicated, the review was directed at Snake River fall chinook salmon and enhanced flows within the Snake River. This document was a primary basis for the recommendations for flow augmentations activities in the NMFS BIOP for the FCRPS.

3.2.2 RECENT INFORMATION

Since the development of the NMFS BIOP, a number of studies, particularly those using PIT tag data, have advanced the knowledge of the effects of augmentation flows on fall chinook salmon. While the picture is still not clear, the benefits of augmentation flows for fall chinook salmon appear to be more well defined and are less critical than portrayed in earlier documents. The primary example of the advance in the state of the knowledge concerning the benefits of flow augmentation is found in the Independent Science Advisory Board's (ISAB's) *Review of Flow Augmentation: Update and Clarification* (ISAB 2003). This document addresses questions specifically directed at the NPPC's consideration of modifying the flow operations of the FCRPS and cites many of the newer studies that cover the effects of flow on survival. Here too, most of the studies on which the ISAB based its assessment concerned data from Snake River stocks, with little data concerning middle or lower Columbia River fish. This document states that "The prevailing flow-augmentation paradigm, which asserts that in-river smolt survival will be proportionally enhanced by any amount of water, is no longer supportable. It does not agree with information now available." This statement sets the stage for the ISAB's new assessment of the effects of flow, particularly flow augmentation, on smolts.

Specifically addressing subyearling chinook salmon in the mid-Columbia, the ISAB stated, "For subyearling chinook salmon, no environmental variable was found to affect

migration speed in the mid-Columbia.” The document noted that there were only limited data on the mid- and lower Columbia regions. It also noted that: “The studies to date do not indicate any statistically significant effect of flow on survival of juvenile salmonids in the mid-Columbia Reach, other than Hanford Reach, where stable flows are an issue.” Much of the information in the ISAB report was derived from a summary document prepared by Giorgi et al. (2002). ISAB did not specifically address the issue of flow enhancement from the Columbia River on Snake River fall chinook salmon.

In addition, the ISAB document noted two other factors that could influence survival in the lower Columbia that are affected by flow. ISAB noted that temperature strongly influenced survival of subyearling chinook salmon. It also identified the timing of arrival at the Columbia River estuary as a factor that might affect survival. Addressing the potential benefits of augmentation on the estuary, ISAB stated, “the effects of the current management of flow augmentation on subsequent estuary and ocean survival are unknown.”

Concerning the relationship of flow to survival for fall chinook salmon in the Snake River, ISAB presented information from Berggren of the Fish Passage Center (Berggren 2000) that indicated a curvilinear relationship between survival and flow from release points to the Lower Granite tailrace (not the hydrosystem pools below the tailrace). ISAB noted that there may be a “break point” below which survival may be affected by flow and estimated that the break point in the Snake River may be in the range of 40 to 50 kcfs. The ISAB study concluded that the reduction in summer flows considered by the NPPC would result in discernable reductions in fall chinook salmon survival. The study noted, however, that the effects on survival of peaking operations at dams might be as important as flow augmentation during these periods.

In response to questions concerning the mandated flow augmentation, ISAB stated: “Based on a literal interpretation of studies reviewed, incremental flow augmentation of the magnitude presently mandated within a year is not likely to have dramatic beneficial effect on in-river smolt survival of out migrants. This conclusion holds for most likely yearling chinook and perhaps fall chinook salmon.”

ISAB addressed another issue of importance to the Banks Lake operation. When asked about the effects of drawdown on storage reservoirs in the Columbia System that are being used to supply augmentation water, ISAB noted that drawdown has an adverse effect on reservoir fisheries and that the needs of anadromous fish and resident fish need to be balanced. ISAB pointed out that the larger and more severe the drawdown, the more severe the effects.

In its conclusion about the NPPC flow scenario, ISAB made another important statement that may relate to the considered actions, noting that the flow reductions in the summer considered by the NPPC might result in reductions in survival of fall chinook salmon.

Prior to the ISAB review, another major review evaluated the effects of flow augmentation, among other factors, affecting survival (Giorgi et al. 2002). This review relied primarily on information from Muir et al. (1999), Conner et al. (1998), and Giorgi and Schlecte (1997) concerning augmentation effects on fall chinook salmon. As noted above, temperature and turbidity were important factors correlated with survival that could not be separated from flow. However Giorgi et al. noted that a CRiSP model evaluation estimated benefits of flow augmentation on annual fall chinook salmon survival over a 5-year period (1991 to 1995). The model results estimated that the total increase in overall survival during passage from Lower Granite Dam to Ice Harbor Dam was less than 1.5 percent for fall chinook salmon as result of all flow augmentations. The authors noted that this conclusion might change if the analysis were conducted using more recent data and models. However, the conclusion regarding the small increase in survival of fall chinook salmon gives some perspective on the likely benefits of flow augmentation. The implication would be that small amounts of flow augmentation would have very low, if any, effects on overall survival.

3.2.3 MODELS FOR ESTIMATING EFFECTS OF ACTIONS

Because of the complexity of multiple actions within the FCRPS and the need to quantify the effects of a host of actions on the anadromous species of interest, various fish passage survival models have been developed by various groups. The most prominent models that have been most recently used have included FLUSH, CRiSP, and SIMPAS juvenile passage survival models. FLUSH was developed by state and Tribal entities. CRiSP was developed by University of Washington researchers and SIMPAS by NMFS. We will not attempt to describe in detail the differences among the various models but will note that they vary in the way they evaluate the effects of different parameters, for example, flow, temperature, dissolved gas saturation, and spill. In general, CRiSP is the most complex (i.e., it uses more variables) and SIMPAS the least complex. Versions of FLUSH and CRiSP were used most extensively to aid in evaluation of the potential effects of removal of the Snake River dams. In addition to using other models, NMFS used SIMPAS primarily for the 1995 and 2000 BIOPs on the FCRPS to determine the effects on all of the listed anadromous stocks in the Columbia River system.

While each of these models has a different way of analyzing the effects of actions on the system, any of them could estimate the likely effects of the actions being considered as

part of the Banks Lake drawdown. The results of recent uses of the CRiSP and SIMPAS models were used to assess actions considered by the NPPC in Fall 2002. One of the key differences between the two models is that SIMPAS does not have a direct flow component in the model while CRiSP does. Suzumoto (2002) described how the SIMPAS model addressed the affects of flow changes. He indicated that reservoir survivals are fixed, based on past empirical data independent of flow. The only effect flow has on survival in this model is how fish are routed through dams. The survival changes that occur in this model are a result of fish taking different routes through a dam (e.g., there is greater mortality of fish that pass through turbines compared to those going over spillways). Suzumoto noted, "Other regionally developed juvenile passage models may be better suited to analyze flow effects." That is one of the reasons the CRiSP model was also used in the NPPC analysis of its proposed flow scenarios for the Snake and Columbia Rivers.

3.2.4 RELATIVE FLOW OF BANKS LAKE ALTERNATIVES AND NPPC ALTERNATIVES

The draft EIS noted that the relative change in flow in the lower Columbia River in August would be small, in the range of 1 to 2 percent, as a result of the alternatives considered. These changes are presented in Table 3-1 of Appendix C and in the text of the draft EIS. We have shown how these changes would appear in the Columbia River at McNary Dam compared to average and low-flow conditions based on outputs from the HYDROSIM models. We used the 1977 water year as representative of low flow and the average of the modeled 50-year period to represent the average flow conditions. We have presented how the No-Action Alternative with uniform drawdown and the Action Alternative with uniform drawdown compare to the BIOP flows without any Banks Lake contribution. The model of BIOP flows was based on HYDROSIM data received from the NPPC (personal communication, John Fazio, Hydrologist, NPPC, February 20, 2003). The average and low-flow years are shown in Figures 3-1 and 3-2 of this report. These figures show how the additional flow from Banks Lake would affect average monthly flows, assuming that no Banks Lake water would be contributed to the BIOP flows (e.g., BIOP w/o Banks in the figures). We have also estimated the change in flow for August for all of the alternative scenarios. These estimates appear in Table 3-1. As can be seen, the overall effect of flow is slight at McNary Dam, even during lowest flow years. For the No-Action Alternative, the range of monthly flow changed is 0 percent to less than 2 percent for any scenario, including the low-flow conditions. The increase at

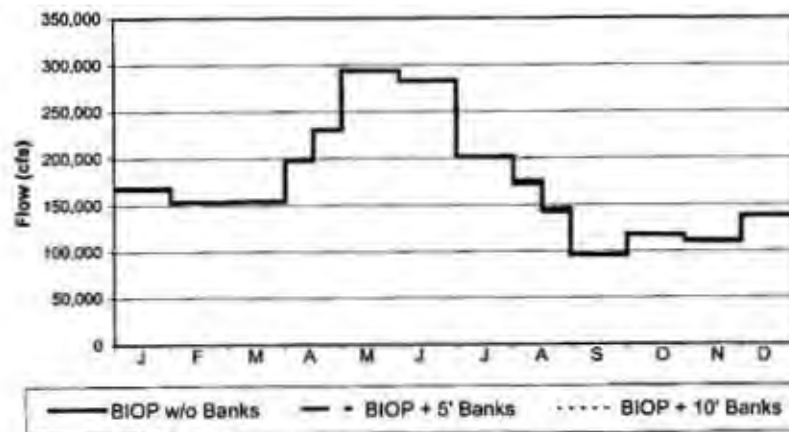


Figure 3-1. McNary Dam Average Flow under the BIOP Flows (without Banks Lake Flow) and Banks Lake Uniform 5- and 10-Foot Drawdown

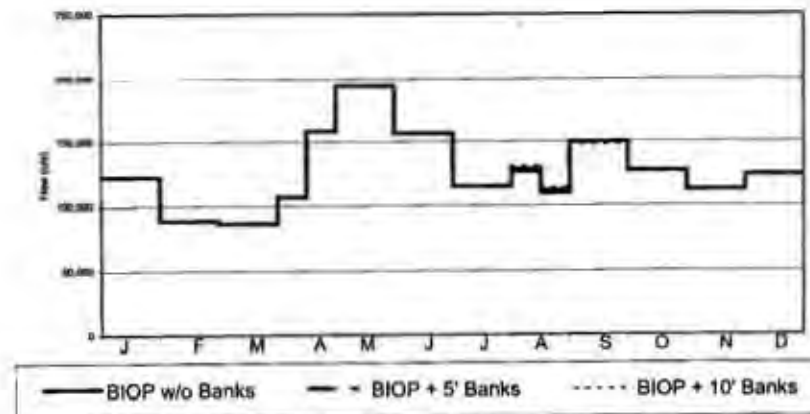


Figure 3-2. McNary Dam Low Flow (1977 Modeled) under the Modeled BIOP Flows (without Banks Lake Flow) and Banks Lake Uniform 5- and 10-Foot Drawdown

Table 3-1. Flow Contribution at McNary Dam from Banks Lake Drawdown Alternative Scenarios for Low-Flow (1977) and Average Years (1929 to 1978)

Alternative	Scenario	Flow Year	Flow (cfs) Additions to BIOP		Flow (cfs) for BIOP w/o Banks			Flow (cfs) for BIOP + Banks			% Flow Increase with Banks		
			Aug 1-15	Aug 16-31	Aug 1-15	Aug 16-31	Average	Aug 1-15	Aug 16-31	Average	Aug 1-15	Aug 16-31	Average
No Action	Low Water	1977	0	0	126,657	109,521	118,089	126,657	109,521	118,089	0.0	0.0	0.0
		All	0	0	172,115	142,626	157,370	172,115	142,626	157,370	0.0	0.0	0.0
	Uniform Draft	1977	2,173	2,173	126,657	109,521	118,089	128,830	111,694	120,262	1.7	2.0	1.8
		All	2,173	2,173	172,115	142,626	157,370	174,288	144,799	159,543	1.3	1.5	1.4
	Early Draft	1977	4,490	0	126,657	109,521	118,089	131,147	109,521	120,334	3.5	0.0	1.9
		All	4,490	0	172,115	142,626	157,370	176,605	142,626	159,615	2.6	0.0	1.4
	Late Draft	1977	0	4,209	126,657	109,521	118,089	126,657	113,730	120,194	0.0	3.8	1.8
		All	0	4,209	172,115	142,626	157,370	172,115	146,835	159,475	0.0	3.0	1.3
	Low Early	1977	4,275	0	126,657	109,521	118,089	130,932	109,521	120,227	3.4	0.0	1.8
		All	4,275	0	172,115	142,626	157,370	176,390	142,626	159,508	2.5	0.0	1.4
Action	Uniform Draft	1977	4,242	4,242	126,657	109,521	118,089	130,899	113,763	122,331	3.3	3.9	3.6
		All	4,242	4,242	172,115	142,626	157,370	176,357	146,868	161,612	2.5	3.0	2.7
	Early Draft	1977	7,923	790	126,657	109,521	118,089	134,580	110,311	122,446	6.3	0.7	3.7
		All	7,923	790	172,115	142,626	157,370	180,038	143,416	161,727	4.6	0.6	2.8
	Late Draft	1977	1,468	6,750	126,657	109,521	118,089	128,125	116,271	122,198	1.2	6.2	3.5
		All	1,468	6,750	172,115	142,626	157,370	173,583	149,376	161,479	0.9	4.7	2.6

Sources: Flow from HYDROSIM model for BIOP flows, John Fazio of NPPC, February 20, 2003; Alternative Flow Contribution, Banks Lake Drawdown EIS, Appendix C

McNary during August under the Action Alternative scenarios ranges from 1.4 to 3.7 percent. Even the largest discharge would increase flow by only 6.3 percent during a low-flow year for a 2-week period. As indicated, these changes are relative to no contribution from Banks Lake rather than having the No-Action flows (RPA 23) already added. The resulting flow changes in the lower Columbia River from any alternative scenario are slight, even during low-flow conditions.

To put some of these changes in flow in perspective, it is informative to compare them to possible future flow scenarios that are actively being considered for the Columbia River basin. As noted earlier, the NPPC is considering flow option changes that differ from those that would occur under the current BIOP plans. These were presented by the NPPC in October 2002 (NPPC 2002) and are currently being evaluated by concerned interests. The flows that are being considered are considerably different than the BIOP flows under average and especially under low-flow conditions. These flows are compared to the BIOP flows in Figures 3-3 and 3-4 for average and low-flow conditions. The relative changes from the BIOP flows resulting from the NPPC-considered flows are shown in Figure 3-5.

During the months of July and the first half of August under the average flow, the NPPC flows are lower than the BIOP flows by about 5,000 to 18,000 cfs (Figure 3-5). Even during low flow, the NPPC reduces flows in July and the first half of August by 18,000 cfs, but increases the flows in the second half of August by about 9,000 cfs. These reductions are in contrast to the expected average monthly contribution of about 2,100 to 4,200 cfs from Banks Lake under uniform drawdown (only about 2,100 cfs maximum over the BIOP because it already includes the flow from the first 5 feet of drawdown) (Table 3-1).

The July period when the NPPC would reduce flows is when many subyearling chinook salmon would be migrating through the lower Columbia River. A figure showing the index count of all smolts and subyearling smolts passing McNary Dam over the last 10 years shows that many of the subyearling chinook salmon pass this region in July and a reduced number pass in August (Figure 3-6). As indicated by the index count at Lower Monumental Dam, the lowest dam on the Snake River with juvenile fish-counting facilities, the timing of migration of Snake River fall chinook salmon is similar (Figure 3-7). The subyearling chinook salmon from the Snake River are the primary stock that the BIOP flows were intended to benefit. The implication is that the NPPC does not consider maintaining flows directed by the BIOP as being as critical or

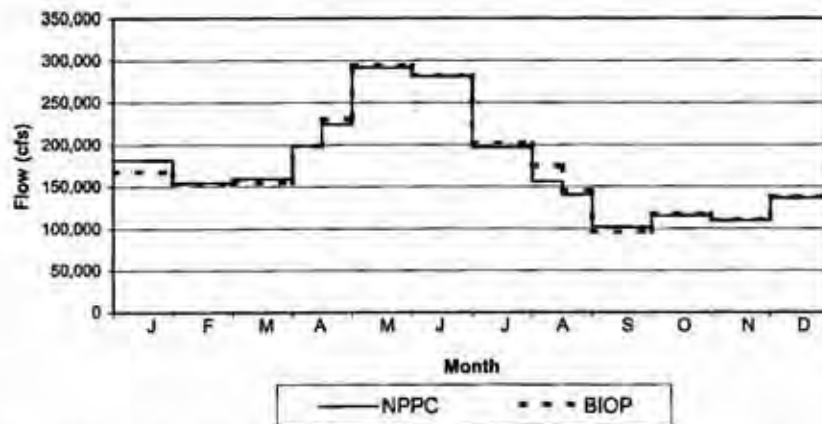


Figure 3-3. McNary Dam Average Flow under the BIOP and NPPC-Proposed Operations

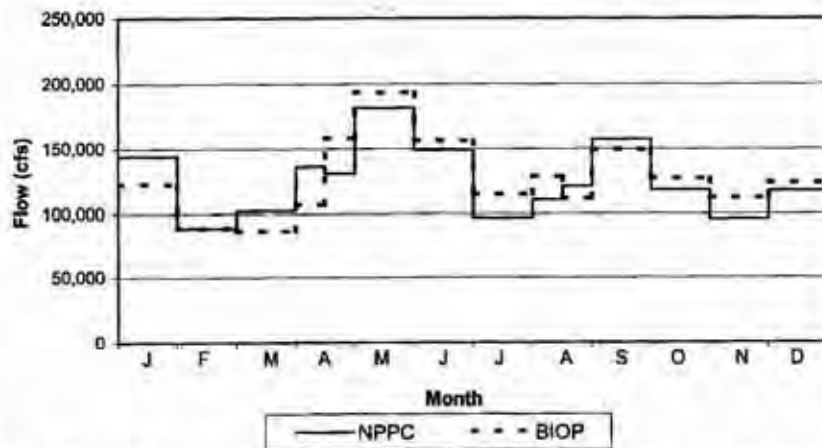


Figure 3-4. McNary Dam Low Flow under the BIOP and NPPC-Proposed Operations

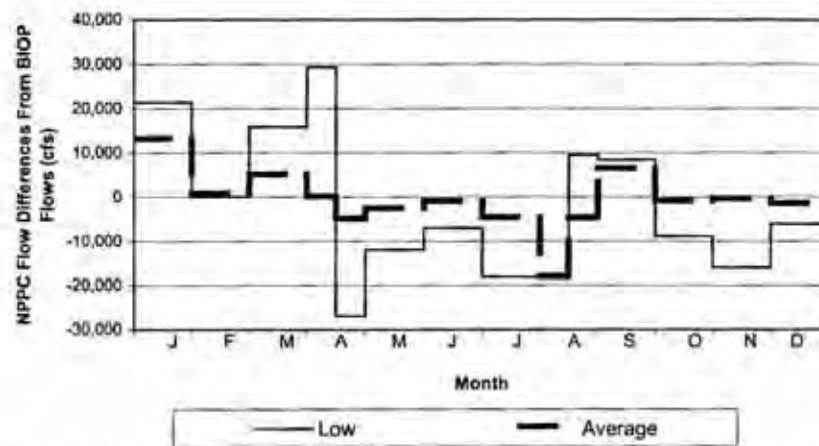


Figure 3-5. Flow Difference at McNary Dam between the NPPC and BIOP Operations

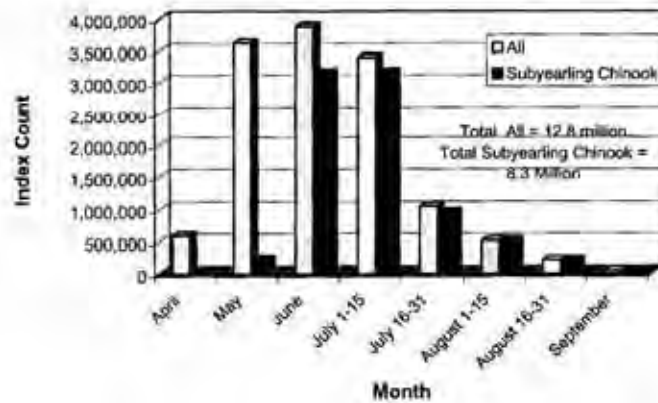


Figure 3-6. McNary Dam Average Total Smolt and Subyearling Chinook Salmon Smolt Indexes, 1993-2002

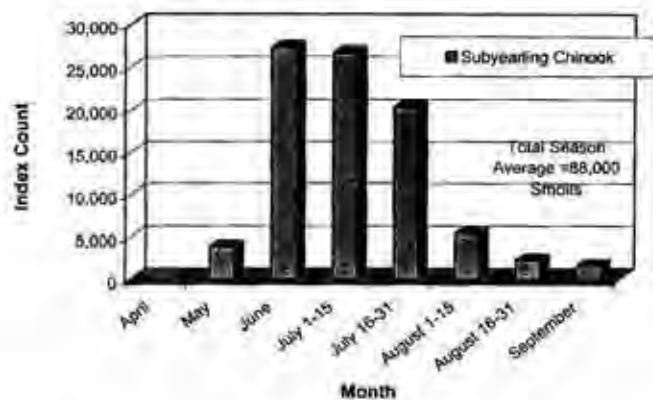


Figure 3-7. Lower Monumental Dam Average Subyearling Chinook Salmon Smolt Index, 1993-2002

necessary for fish in this reach of the river as it does for other flow uses. What is very apparent from the figures is that the NPPC alternative is much different in August at McNary than the BIOP. Also, contributions from Banks Lake flow are very small relative to the NPPC-proposed flow changes. The NPPC plan also recommends changes in the Snake River flows, which include a flow reduction of about 1,000 cfs in July during average years and 13,000 cfs in low-flow years during this period. The first-half-of-August flows were also reduced relative to the BIOP but the second half increased (HYDROSIM Model of NPPC and BIOP Flows: personal communication, John Fazio, Hydrologist, NPPC, Portland, Oregon, February 20, 2003).

Generally, during the highest outmigration period for juvenile fall chinook salmon (June and July, Figure 3-7), flows remained nearly the same or were reduced in the Snake River in the proposed NPPC plan. These changes may be important, particularly in July, which is typically a period of high outmigration of fall chinook salmon (subyearlings) in the Snake and Columbia River system (Figures 3-6 and 3-7). The NPPC attempted to address the effects of changes in flow partly through use of CRISP and SIMPAS fish passage model estimates of juvenile salmon survival.

3.2.5 MODEL ESTIMATES OF SURVIVAL

Using models to estimate juvenile salmonid survival through the Columbia Basin hydrosystem has become an accepted and frequently used method for evaluating the effects of actions considered by federal agencies. While model estimates of fish survival

have failings, they do provide a quantitative measure of the potential effects of actions. By their nature, they cannot include the effects of actions that do not have a quantitative measure or estimated effect.

We are unaware of model estimates being made for the scenarios being considered for the Banks Lake drawdown alternatives. We believe that Reclamation should have seriously considered using models to evaluate the alternatives so that an approximation of the benefits, if any, could be presented to the decision makers. Because Reclamation did not conduct this evaluation, the Districts retained Chris Van Holmes and Dr. James Anderson of Columbia Basin Research, University of Washington, to run their CRiSP juvenile passage model for a subset of the scenarios being considered. The results of this analysis and a description of the methods used are presented in Attachment A of this document (Van Holmes and Anderson 2003).

The CRiSP model was selected for several reasons. First, it has been used extensively in past analyses of the Columbia River. Second, it has recently been used by the NPPC in its evaluation of the various flow alternatives being considered for the newly proposed Draft Mainstem Amendments issued in October 2002. Third, it is continually being updated with recent empirical survival data to make it as current as possible. Finally, unlike SIMPAS, which has no flow component, CRiSP uses flow as one of the parameters for survival. We did not use the FLUSH model because we did not have direct access to it.

We selected five of the flow alternatives for evaluation with the CRiSP model. Relative survival comparisons use the BIOP flow conditions as the baseline against which the alternatives are compared. The current BIOP conditions include the 5-foot uniform drawdown of Banks Lake, so this alternative is the base case that other alternatives are compared against. The five flow alternatives encompassed the range of flow scenarios developed by Reclamation, as shown in Appendix C of the draft EIS:

- Low Water (LW): Banks Lake is at 1,565 feet at the start of August and no additional flow is supplied
- Uniform Draft 5 feet (UD5): Banks Lake is drawn down from 1,570 to 1,565 feet through August
- Uniform Draft 10 feet (UD10): Banks Lake is drawn down from 1,570 to 1,560 feet through August
- Early Draft 10 feet (ED10): Banks Lake is drawn down from 1,570 to 1,560 feet during the first half of August

- Late Draft 10 feet (LD10): Banks Lake is drawn down from 1,570 to 1,560 feet during the second half of August

The main emphasis of the CRiSP analysis was on the stock—Snake River fall chinook salmon—that the BIOP had intended to benefit through its drawdown-related RPAs for Banks Lake. In addition, the CRiSP model was run for all listed stocks that may be present in the river above Bonneville Dam during August. The model was run for the Hanford Reach fall chinook salmon, which is not listed under ESA but is important and is the most abundant stock in the river during August. The model was also run for lower Columbia River stocks. It was assumed that they would have the same survival as Snake River fall chinook salmon traveling in-river below the Dalles Dam. This reach is the first area in the lower Columbia River where this chinook salmon stock occurs in the system. Because of lack of specific data for this stock, survival estimates are less reliable.

All stocks were modeled from selected locations in the system for which tagging data were available to calibrate the models through Bonneville Dam. Modeling of survival through the estuary was also performed, but the results are not discussed because, unlike the survival modeled through the hydrosystem, the estimates for this lower area cannot be calibrated with empirical survival information from PIT tag data. While the estimates may supply some indication of changes in survival, the reliability of this information is much less than that through the hydrosystem. Also, considering the very low overall effects on survival estimated from the CRiSP model through Bonneville Dam and its lower reliability, we did not believe using this information would add to the analysis.

The CRiSP model was also used to estimate fish travel time through the system and water particle travel time.

The CRiSP model used three flow conditions to encompass the range of possible flows that may occur during Banks Lake drawdown. These modeled flows under the BIOP conditions with modification from the Banks Lake drawdown were: 1960 representing average, 1974 representing high flow, and 1977 representing low flow. These flow conditions were based on the HYDROSIM flows developed for the NPPC for the Draft Mainstem Amendments.

The results of all survival estimates are presented in Attachment A of this document. Table 3-2 summarizes the flow conditions and stocks for which the model estimated changes in survival. Based on the model results, spring migrating stocks, such as the

Table 3-2. Juvenile Passage Survival to Below Bonneville Dam of Five of the Banks Lake Drawdown Flow Scenarios Based on CRISP Model Results

Drawdown Alternative ^a	Stock	Flow	In-River Survival	Total Survival	Fraction of Released Transported	In-River Survival Change from UD5		Total Survival Change from UD5		Change per 10,000 Smolts ^b	
						Absolute	Percent	Absolute	Percent	In-River	Total
LW	Hanford Fall Chinook	Average	0.40856	0.50023	0.217	-0.00001	-0.002%	-0.00001	-0.002%	-0.1	-0.1
UD5	Hanford Fall Chinook	Average	0.40857	0.50024	0.217						
UD10	Hanford Fall Chinook	Average	0.40859	0.50026	0.217	0.00002	0.005%	0.00002	0.004%	0.2	0.2
ED10	Hanford Fall Chinook	Average	0.40860	0.50026	0.217	0.00003	0.007%	0.00002	0.004%	0.3	0.2
LD10	Hanford Fall Chinook	Average	0.40856	0.50024	0.217	-0.00001	-0.002%	-0.00000	0.000%	-0.1	0.0
LW	Hanford Fall Chinook	High	0.42732	0.51610	0.222	-0.00001	-0.002%	-0.00001	-0.002%	-0.1	-0.1
UD5	Hanford Fall Chinook	High	0.42733	0.51611	0.222						
UD10	Hanford Fall Chinook	High	0.42734	0.51611	0.222	0.00001	0.002%	0.00000	0.000%	0.1	0.0
ED10	Hanford Fall Chinook	High	0.42733	0.51610	0.222	0.00000	0.000%	-0.00001	-0.002%	0.0	-0.1
LD10	Hanford Fall Chinook	High	0.42735	0.51612	0.222	0.00002	0.005%	0.00001	0.002%	0.2	0.1
LW	Hanford Fall Chinook	Low	0.39530	0.56592	0.370	0.00000	0.000%	0.00001	0.002%	0.0	0.1
UD5	Hanford Fall Chinook	Low	0.39530	0.56591	0.370						
UD10	Hanford Fall Chinook	Low	0.39532	0.56592	0.370	0.00002	0.005%	0.00001	0.002%	0.2	0.1
ED10	Hanford Fall Chinook	Low	0.39530	0.56592	0.370	0.00000	0.000%	0.00001	0.002%	0.0	0.1
LD10	Hanford Fall Chinook	Low	0.39534	0.56593	0.370	0.00004	0.010%	0.00002	0.004%	0.4	0.2
LW	Snake Fall Chinook	Average	0.14200	0.43332	0.483	-0.00009	-0.063%	0.00000	0.000%	-0.9	0.0
UD5	Snake Fall Chinook	Average	0.14209	0.43332	0.483						
UD10	Snake Fall Chinook	Average	0.14216	0.43333	0.483	0.00007	0.049%	0.00001	0.002%	0.7	0.1
ED10	Snake Fall Chinook	Average	0.14228	0.43334	0.483	0.00019	0.134%	0.00002	0.005%	1.9	0.2
LD10	Snake Fall Chinook	Average	0.14224	0.43333	0.483	0.00015	0.106%	0.00001	0.002%	1.5	0.1
LW	Snake Fall Chinook	High	0.14946	0.42065	0.457	-0.00009	-0.060%	-0.00001	-0.002%	-0.9	-0.1
UD5	Snake Fall Chinook	High	0.14955	0.42066	0.522						
UD10	Snake Fall Chinook	High	0.14957	0.42066	0.457	0.00002	0.013%	0.00000	0.000%	0.2	0.0
ED10	Snake Fall Chinook	High	0.14954	0.42066	0.457	-0.00001	-0.007%	0.00000	0.000%	-0.1	0.0
LD10	Snake Fall Chinook	High	0.14956	0.42066	0.457	0.00001	0.007%	0.00000	0.000%	0.1	0.0

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Table 3-2. Juvenile Passage Survival to Below Bonneville Dam of Five of the Banks Lake Drawdown Flow Scenarios Based on CRISP Model Results (continued)

Drawdown Alternative ^{a/}	Stock	Flow	In-River Survival	Total Survival	Fraction of Released Transported	In-River Survival Change from UD5		Total Survival Change from UD5		Change per 10,000 Smolts ^{b/}	
						Absolute	Percent	Absolute	Percent	In-River	Total
LW	Snake Fall Chinook	Low	0.13970	0.45703	0.522	-0.00009	-0.064%	0.00000	0.000%	-0.9	0.0
UD5	Snake Fall Chinook	Low	0.13979	0.45703	0.522						
UD10	Snake Fall Chinook	Low	0.13990	0.45704	0.522	0.00011	0.079%	0.00001	0.002%	1.1	0.1
ED10	Snake Fall Chinook	Low	0.14014	0.45705	0.522	0.00035	0.250%	0.00002	0.004%	3.5	0.2
LD10	Snake Fall Chinook	Low	0.13972	0.45703	0.522	-0.00007	-0.050%	0.00000	0.000%	-0.7	0.0
LW	Snake Steelhead	Low	0.06469	0.60227	0.632	-0.00003	-0.046%	0.00000	0.000%	-0.3	0.0
UD5	Snake Steelhead	Low	0.06472	0.60227	0.632						
UD10	Snake Steelhead	Low	0.06481	0.60227	0.632	0.00009	0.139%	0.00000	0.000%	0.9	0.0
ED10	Snake Steelhead	Low	0.06488	0.60227	0.632	0.00016	0.247%	0.00000	0.000%	1.6	0.0
LD10	Snake Steelhead	Low	0.06474	0.60227	0.632	0.00002	0.031%	0.00000	0.000%	0.2	0.0
LW	Lower River Chinook	Average	0.82889		0.000	-0.00051	-0.061%			-5.1	
UD5	Lower River Chinook	Average	0.82940		0.000						
UD10	Lower River Chinook	Average	0.82970		0.000	0.00030	0.036%			3.0	
ED10	Lower River Chinook	Average	0.83045		0.000	0.00105	0.127%			10.5	
LD10	Lower River Chinook	Average	0.82998		0.000	0.00058	0.070%			5.8	
LW	Lower River Chinook	High	0.84565		0.000	-0.00032	-0.038%			-3.2	
UD5	Lower River Chinook	High	0.84597		0.000						
UD10	Lower River Chinook	High	0.84599		0.000	0.00002	0.002%			0.2	
ED10	Lower River Chinook	High	0.84584		0.000	-0.00013	-0.015%			-1.3	
LD10	Lower River Chinook	High	0.84599		0.000	0.00002	0.002%			0.2	
LW	Lower River Chinook	Low	0.82941		0.000	-0.00051	-0.061%			-5.1	
UD5	Lower River Chinook	Low	0.82992		0.000						
UD10	Lower River Chinook	Low	0.83033		0.000	0.00041	0.049%			4.1	
ED10	Lower River Chinook	Low	0.83158		0.000	0.00166	0.200%			16.6	
LD10	Lower River Chinook	Low	0.82945		0.000	-0.00047	-0.057%			-4.7	

^{a/} See text for description of alternatives

^{b/} Indicates alternative resulting change in number of smolts relative to 10,000 smolts at the start of the migration

Source: Van Holmes and Anderson 2003

Snake River spring/summer chinook salmon and upper Columbia spring chinook salmon, are unaffected by flows in August because nearly all of these stocks have completely left the river system by this time (Attachment A of this document). While the model results showed some slight change in in-river survival during low-flow conditions for Snake River steelhead in-river migrants, there was no overall effect on survival even to the 1 in 100,000 (0.00001) level of estimated change in survival (Table 3-2). Based on the model, this means that the survival of not one spring migrating fish in over 100,000 beginning migration would be affected by the addition of flow under any of the scenarios.

Theoretically, the Hanford Reach fall chinook salmon and Snake River fall chinook salmon would be the stocks most likely to be affected by changes in the reaches below the Snake River from flows added in August. As shown in Table 3-2, estimated changes in survival are at the lowest limit of model precision. The estimated maximum increase in total survival over baseline conditions for any flow alternative or Banks Lake drawdown alternative was 0.00002 for these two stocks. If the uniform 5-foot drawdown were not included in the BIOP conditions, the maximum reduction in total survival estimated would be 0.00001. In other words, fewer than 0.5 smolt in 10,000 smolts beginning their migration to the sea would be affected through Bonneville Dam by any of the Banks Lake flow scenarios. Modeled effects would be greater for smolts remaining in the river, but very few of either the Snake River or Hanford Reach subyearling chinook salmon are in the river below McNary Dam because many of them are transported. Typically, 80 percent of Snake River fall chinook salmon that arrive below Bonneville Dam are transported. During the low-flow year of 2001, about 99 percent of the Snake River fall chinook salmon arrived by barge. While the portion that were transported is lower for Hanford Reach fish because they are collected only at McNary Dam, the majority arriving below Bonneville Dam were also in barges.

Slightly larger increases in survival are estimated for the portion of the lower Columbia River chinook salmon originating in the Bonneville pool (Table 3-2). However, the portion of lower Columbia River fish originating in the Bonneville pool is small; the vast majority of these fish originate in major tributaries below Bonneville Dam. Also, the model assumed that all fish began their passage from the base of the Dalles Dam, while in reality they would originate from several small streams entering the reservoir below the dam. Furthermore, as noted above, these values are based on Snake River fish passage survival, not Columbia River stock. Even so, the majority of model results show a less than 0.001 increase in survival, or a less than 0.1 percent increase in relative survival from increased flow.

As presented in Attachment A of this document, some additional effects on survival may occur for stocks below Bonneville Dam from increased flow, although we believe numerical estimates for this region to be unreliable due to the inability to calibrate the data. However, the extremely low estimate of survival changes within the reach for which data are available suggests that if flow from Banks Lake does have any effect, it would be extremely small below Bonneville Dam.

Another way to examine the effects of flow on fish is to consider how flow affects their travel time in the system. Travel time has often been considered a factor influencing survival of smolts in the Columbia River system. Table 3-3 presents the results of the CRISP analysis for changes in estimated travel time resulting from the drawdown alternatives. This table shows only where travel time changes would occur between McNary Pool to below Bonneville Dam. Following the trend of survival numbers, changes in estimated travel time were extremely small for fish remaining in the river. While most stocks and conditions show no modeled changes in travel time (Table 4, Attachment A of this document), the largest modeled change from the base case (UD10) is on the order of minutes, not days or hours. The largest change estimated for Snake River fall chinook salmon was a reduction of 72 minutes out of a 8.9-day travel period though the reach. It is also interesting to note that changes in travel time were undetectable for Hanford Reach fall chinook salmon.

Table 3-3. Fish Travel Time (TT) for Stocks Showing Deviation from Base Case UD5 between McNary and Bonneville Dams

Drawdown Alternative ^{a/}	Release site	Stock	Flow	McNary-Bonneville TT (days)	Change in TT (days) from UD5	Change in TT (Minutes) from UD5
ED10	Snake R. Trap	Snake River Fall Chinook	Average	7.25	-0.01	-14
LD10	Snake R. Trap	Snake River Fall Chinook	Average	7.27	0.01	14
LW	Snake R. Trap	Snake River Fall Chinook	High	6.29	-0.01	-14
UD10	Snake R. Trap	Snake River Fall Chinook	High	6.29	-0.01	-14
ED10	Snake R. Trap	Snake River Fall Chinook	High	6.29	-0.01	-14
LW	Snake R. Trap	Snake River Fall Chinook	Low	8.98	0.01	14
UD10	Snake R. Trap	Snake River Fall Chinook	Low	8.96	-0.01	-14
ED10	Snake R. Trap	Snake River Fall Chinook	Low	8.92	-0.05	-72
LD10	Snake R. Trap	Snake River Fall Chinook	Low	8.98	0.01	14
LW	Snake R. Trap	Snake River Steelhead	Low	11.83	-0.02	-29
UD10	Snake R. Trap	Snake River Steelhead	Low	11.88	0.03	43
ED10	Snake R. Trap	Snake River Steelhead	Low	11.91	0.06	86
ED10	Rock Is. Tailrace	Upper Columbia Spring Chinook	Average	8.54	0.01	14

^{a/} See text for alternative descriptions.

Source: Table 3 in Attachment A of this report.

Van Holmes and Anderson's (2003) analysis of the effects of the alternatives included the following statement concerning survival changes and travel time influences:

"To put these changes into perspective note that on the average (1992-2002) the total smolt index migrating past McNary Dam in August is 630,000 smolts of all species, of which 99 percent are fall chinook salmon. A Banks Lake drawdown of 10 ft from the early, late or uniform drawdown periods over August would increase the number of smolts reaching Bonneville Dam by between 6 to 13 smolts out of the total of 630,000. In comparison, the total yearly smolt index at McNary Dam is 12 million smolts. The corresponding reduction in travel time between McNary and Bonneville dams is at most one hour on a 9-day travel time. Most scenarios increased travel time to Bonneville Dam by less than 14 minutes on travel times of about 2 weeks."

Even if the flow amount had some influence on direct-passage survival of subyearling chinook salmon in the summer, it would have very little direct effect on the Snake River fall chinook salmon stock. This is because upwards of 80 percent of all Snake River fall chinook salmon may be barged to below Bonneville Dam, with only 20 percent or less actually traveling in the lower Columbia River. Many of the Hanford Reach fall chinook salmon stock are also barged at McNary Dam, although the percent is lower because McNary is the last facility with barging operations, while Snake River fish pass four dams with barging facilities. In addition, as is shown in Figures 3-6 and 3-7, most subyearling chinook salmon from both the Snake River and Hanford Reach have passed beyond McNary Dam by the first of August. Based on average passage index counts between 1993 and 2002, over 90 percent of all subyearling chinook salmon have passed McNary Dam by July 31 (DART passage data). The same holds true for the Snake River fall chinook salmon. Based on similar data, over 89 percent of the in-river migrants have passed Lower Monumental Dam by July 31. While some of the late July migrating fish that were not barged may still be in the reach below McNary Dam in early August, most of these would have passed through the region, based on estimated typical travel times of less than 9 days, even under low flow conditions (Table 3-3). Many of these factors ultimately are included in the CRISP model, resulting in almost no estimated change in survival of any of the stocks originating upstream of McNary Dam. The lower Columbia River chinook salmon really do not enter the system until Bonneville pool or downstream of the dam, so they only pass one dam at most. Like the stocks originating upstream, most of these would have already outmigrated prior to August. The lower river chinook stocks included in the analysis consist primarily of subyearling outmigrating fish, although some yearling migrants are present (Myers et al. 1998). Yearling fish leave in

the spring, while only some of the subyearlings would possibly still be in the river during August. By the time flow reaches this area, additional flow has entered the Columbia from the John Day, the Deschutes, and other rivers, and just below Bonneville, the Willamette River enters, so that the relative contribution of any flow from Banks Lake would be even more diluted. Other factors not modeled may also be of importance in overall survival relative to flow.

The additional flow to the estuary may have benefits that cannot be modeled. Current models cannot be calibrated, so the validity of survival results cannot be confirmed and therefore should not be relied on at this time. At any rate, the effect of flow from Banks Lake on the estuary would be very slight, as the Columbia flow is greatly increased by the Willamette River, as well as many other major rivers, before reaching the estuary. Benefits to other lower river subyearling chinook salmon could not be determined with the CRISP, but they are likely to be much less than those measured, as these fish are further downstream (most below Bonneville Pool and below), where flow effects would be greatly reduced because of the increased volume from other river inflows.

3.2.6 SUMMARY

To meet the requirements of NEPA, the EIS needs to not only evaluate the effects of reservoir changes on Banks Lake resources but also needs to answer the question: What are the effects of the intended actions on the resources of concern? NMFS has specified in its BIOP what resources would receive the benefits. We believe that Reclamation should evaluate the effects on these resources in as quantitative a manner as possible with available data and methods. We have included one set of model results addressing the range of flows on downstream passage survival using the CRISP passage model. This analysis contributes to the full disclosure required under NEPA.

Our analysis makes the following major points:

- First, the benefits of any flow augmentation for the subyearling chinook salmon in the mid- and lower Columbia are in question, based on recent analysis and interpretation of flow effects (ISAB 2003). The ISAB (2003) stated that the assumption of proportional survival benefits of flow augmentation could not be supported. For subyearling chinook salmon in the mid-Columbia, ISAB indicated that no variable was found to correlate with migration speed. Additionally, ISAB did not believe that the incremental flow now mandated would result in "dramatic benefits" to in-river smolt survival.

- Second, based on the CRISP model analysis, none of the Banks Lake scenarios increased estimated subyearling chinook salmon survival by more than 0.01 percent; in other words, there is an increase in estimated smolt survival of less than one fish for every 10,000 smolts beginning the migration.
- Third, modeled fish travel time, another factor often considered important in survival, would not be affected at all in the reach between McNary Pool and Bonneville Dam for most fish under the flow and drawdown scenarios. Where effects were estimated, the reduction was typically about 14 minutes of travel time in this reach out of a total travel time of an estimated 6 to 9 days.
- Additionally, most subyearling chinook salmon pass the reach from McNary Dam to Bonneville in barges, and typically 80 to 90 percent of subyearling fish pass McNary Dam before August 1.
- Uncertainty concerning both the benefits and deficits of flow changes will remain because not all factors potentially affected by flows are included in the models, and different models use different sets of assumptions, giving different results.
- Finally, the regional managers at the NPPC are considering flow changes, including deviations from the BIOP recommended flows, that would be much greater than those proposed in the Banks Lake alternatives. These changes would result in reduced flows in the lower Columbia River reach during much of the period when juvenile subyearling chinook salmon would be migrating through this region, including part of August when Banks Lake flows are to be released. The current NPPC position is that its proposed flow changes would adequately protect the anadromous endangered fish species of the Columbia River.

4. WATER PARTICLE TRAVEL TIME ISSUES

The proposed changes in Columbia River flow volumes resulting from implementation of BIOP RPA 31 would affect flow velocity and water particle travel time in the lower Columbia. The draft EIS refers to this effect in several sections. Comments on these sections and evaluation of existing velocity relationships with flow (discharge and volume) in the lower Columbia River are included in this section. The proposed flow augmentation from Banks Lake drawdown was added to the existing flow data to determine the potential change in velocity and water particle travel time.

4.1 COMMENTS ON DRAFT EIS WATER PARTICLE TRAVEL TIME ASSESSMENT

The draft EIS did not thoroughly assess the effect of BIOP RPA 31 on water particle travel time through the lower Columbia reservoirs. The purpose of the Proposed Action as stated in the draft EIS was to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed salmonid stocks. However, the issues related to this action, as identified during the scoping process for the draft EIS, did not include the effect on Columbia River water particle travel time downstream of McNary Dam.

The No-Action Alternative is based on some other operation than historical operations. On page 2-7, the impact on Columbia River flow at McNary Dam was discussed. The increase in flow volume at the dam resulting from implementation of the Action Alternative scenarios would range from 1 to 2 percent during August, compared to the No-Action Alternative scenarios. This assessment should have been included in the Environmental Consequences chapter. The assessment of the effect on existing flow conditions in the Columbia River in the main body of the draft EIS is inadequate.

The Affected Environment chapter did not include a water resources subsection. This is where the existing water resources of the Columbia River would have been described if the list of issues included flow conditions in the lower Columbia River.

The Environmental Consequences chapter also did not assess impacts on the lower Columbia. The only water resources impact assessment was on Banks Lake surface water quality. There is no discussion in the main body of the draft EIS of the Hydrologic Report included in Appendix C, where calculations of changes in flow volume at McNary Dam appear.

The description of the hydrologic analysis method in Appendix C lacks sufficient detail to determine if the flow volume from RPA 31 was properly added to the flow at McNary Dam. On page 2 of Appendix C, the use of the Bonneville Power Administration (BPA) hydro-simulation data is discussed. The data include output from the FCRPS studies that reflect operations that comply with the 2000 BIOP. The additional flows resulting from the various draft scenarios at Banks Lake are added and subtracted from the modeled flows at McNary Dam. It is unclear how the Banks Lake flows were accounted for at McNary. If the hydro-simulation data are already included RPA 23 and 31, then there could have been double counting of the Banks Lake flow contribution at McNary Dam.

Methodology aside, the results of the hydrologic analysis indicate (page 5 of Appendix C) that the addition of Banks Lake flow augmentation water will not

significantly increase the probability of meeting the BIOP flow objective at McNary. A flow objective of 195,000 cfs was used rather than the actual BIOP objective of 200,000 cfs because of model uncertainty. On page 2 of Appendix C, this compensation for the model uncertainty is discussed. The uncertainty of the model results reinforces the comment on significance. The flow augmentation from Banks Lake drawdown ranges from 790 to 7,923 cfs. This range is the same order of magnitude of the 5,000 cfs compensation for model uncertainty. Any level of impacts inferred from the model results should consider the limits of the ability of the model to predict effects with sufficient certainty.

On page 4-18, there is a discussion of threatened, endangered, and special-status species (Snake River fall chinook salmon). The intended benefit of the 200,000 cfs flow objective at McNary Dam is stated, but there is no discussion of how this benefit would be achieved. There is no discussion of the particle travel time downstream of McNary at this or any other discharges.

On Page 4-45, in the Cumulative Impacts subsection, the contribution of Bank Lake flow augmentation to the total contributed by all sources adding flow is mentioned. There is no quantification of the amount of flow augmentation provided by other sources and no comparison to the amount provided by Banks Lake. The draft EIS states only that the individual contribution of Banks Lake is not significant to the overall flow of the Columbia River. Because there was not an impact assessment of flow conditions in the lower Columbia, the draft EIS did not demonstrate enhancements to juvenile out-migration of ESA-listed salmonid stocks.

4.2 EVALUATION OF WATER PARTICLE TRAVEL TIMES

Velocity measurements can be used to determine water particle travel time through a given river reach. In standard hydraulic engineering analysis, water velocity is related to flow (discharge or volume-per-time) through a specific river cross-section by use of a rating curve. A curve is developed by surveying the cross-sectional profile of the river and measuring depth and velocity at several points across the river cross-section. The U.S. Geological Survey (USGS) has been measuring depth, velocity, and cross-sectional area to calculate discharge at two locations on the lower Columbia River. Particle travel time was evaluated using USGS data from The Dalles location.

Additionally, water particle travel time can be determined without specific velocity data. For reservoirs in particular, an alternative method is typically used to determine water particle travel time. This method uses the volume of water in the reservoir and the discharge to determine the residence time of flow through the reservoir. Several

hydraulic models, including the CRISP model, use residence time to represent water particle travel time. Water particle travel time was evaluated using volume and discharge data for the reservoirs upstream of Bonneville, The Dalles and John Day dams, which were obtained from the U.S. Army Corps of Engineers (Corps) HEC-5Q models of the Columbia/Snake River system.

The HEC-5Q model input specifies the relationship between reservoir stage, volume, and discharge, where discharge is the maximum outlet capacity at the dam. It is important to note that the maximum discharge does not always occur for a given reservoir stage.

One of the most important aspects of velocity-flow relationships within reservoirs is the fact that the reservoir water-surface elevation (stage) is controlled by the dam outlet gates and spillways. There is a specific volume-stage relationship for each reservoir. Stage and volume are controlled at the dam outlet. Water particle travel time can also be controlled at the dam outlet because water particle travel time is dependent on reservoir volume. Furthermore, the NPPC has been considering theories regarding the effect of the rate of closure of dam outlet gates on reservoir residence time (ISAB 2003). According to the theories, a rapid gate closure could reduce the hydraulic gradient of the flow through the reservoir and therefore increase water particle travel time.

The velocity data that the USGS collected at its monitoring station (#14105700) near The Dalles are shown in Table 4-1 (Attachment A of this document shows the complete USGS data sheets). The monitoring station is located just downstream of the dam. The period of record of the station begins on June 11, 1985, and ends on December 20, 2002. Width, area, mean velocity, gage height, and streamflow are reported. The streamflow (i.e., discharge) was measured by taking several velocity and depth measurements across the river. The relationship between these basic measurements and stage are shown in Figures 4-1 and 4-2. Generally, area increases with increasing stage, which is expected. However, velocity does not show this regular relationship. This is due to the control of stage at Bonneville Dam. Recall that velocity through a reservoir is a function of reservoir volume (i.e., stage) and discharge. The USGS calculated discharge, which is equal to the product of measured quantities: mean velocity and area of the wetted river cross-section. There were several zero mean velocity recordings with concurrent non-zero stages, areas and streamflows. Apparently, USGS was able to estimate discharge without measuring velocity. TtFW performed a regression analysis of the non-zero velocity, streamflow and stage. Discharge was specified as the independent variable, and stage and velocity were the dependent variables. A plot of the regression results is shown as Figure 4-3.

Table 4-1. USGS Velocity, Stage, and Area Measurements

Date/Time	Area (ft ²)	Velocity (fps)	Stage (ft)	Discharge (cfs)
19d	12s	12s	12s	12s
6/11/85	98700	2.88	78.49	284000
10/23/90 7:45	92800	1.67	74.74	155000
10/23/90 8:25	93800	1.64	74.75	154000
3/27/91 15:05	96100	1.88	76.63	181000
6/21/91 10:20	98300	2.74	78.29	269000
7/3/91 10:45	96900	2.95	77.5	286000
7/3/91 11:33	98200	2.84	77.57	279000
7/9/92 10:40	95100	1.23	76.17	117000
7/9/92 11:40	96700	1.16	76.17	112000
2/22/93 12:47		1.9	75.45	179000
6/8/93 15:05		3.2	79.3	318000
8/23/93 13:15		1.22	75.22	115000
9/28/93 14:06		0	76.09	131000
12/10/93 11:20		0	76.73	90800
4/12/94 11:23		0	74.56	152000
6/7/94 11:47		0	77.18	217000
10/12/94 9:18		0	76.81	132000
2/8/95 11:56		0	77.05	212000
3/23/95 11:34		0	78.49	289000
11/22/95 10:30		0	75.59	207000
5/22/97 10:00		0	85.14	510000
6/27/97 14:29		0	81.3	383000
1/21/98 10:59		0	76.88	218000
4/24/98 11:48		0	77.97	229000
7/22/98 14:28		0	77.71	211000
11/25/98 11:03		0	76.04	138000
5/18/99 12:44		0	77.85	220000
10/25/99 13:20	95900	0	76.71	112000
4/20/00 10:56	100000	0	80	303000
6/15/00	99300	0	79.29	284000
8/31/00	94500	1.47	75.7	139000
3/9/01 11:11	93100	1.5	74.62	140000
9/26/01 12:13	95700	1.36	76.61	150000
2/6/02 11:57		0	74.66	159000
7/24/02 10:07		0	78.71	214000
12/20/02 10:19	101000	1.03	76.56	104000
12/20/02 10:20	101000	1.03	76.52	104000

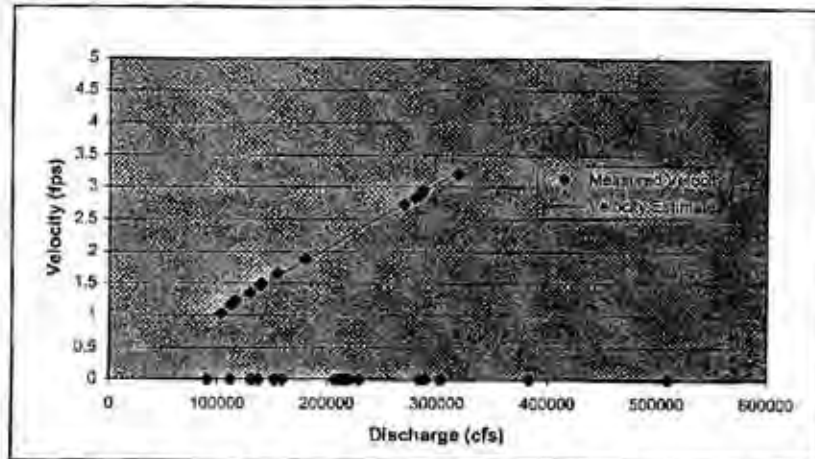


Figure 4-1. Velocity-Discharge Rating Curve, USGS Columbia River at The Dalles Gauge (14101500)

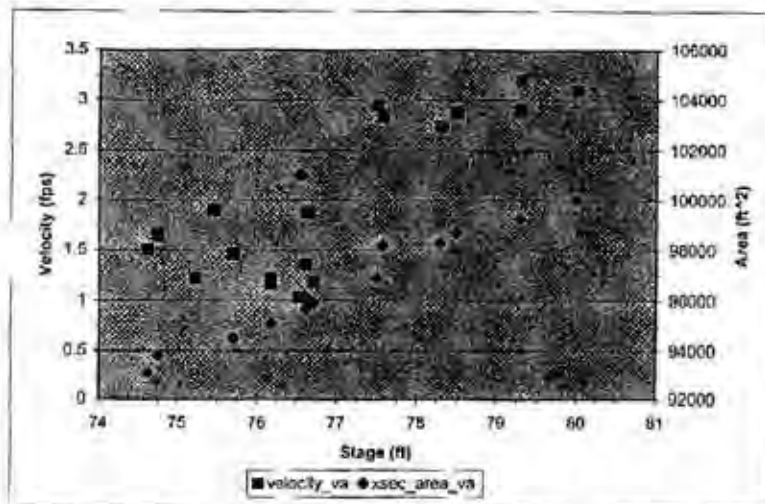


Figure 4-2. Stage-Velocity-Area Rating Curve, USGS Columbia River at The Dalles Gauge (14101500)

Table 4-2. Travel Time Estimate using HEC-5Q Model Data

John Day Pool					The Dalles Pool					Bonneville Pool				
Residence					Residence					Residence				
Storage (ac-ft)	Discharge (cfs)	Stage (ft)	Time (hrs)	Velocity (fps)	Storage (ac-ft)	Discharge (cfs)	Stage (ft)	Time (hrs)	Velocity (fps)	Storage (ac-ft)	Discharge (cfs)	Stage (ft)	Time (hrs)	Velocity (fps)
300000	50000	190	72.6	1.5	100	10	101	121.0	0.3	145000	50000	35	35.1	1.9
470000	100000	200	56.9	2.0	5000	20000	110	3.0	11.7	185000	125000	40	17.9	3.8
650000	300000	210	26.2	4.3	21000	50000	120	5.1	7.0	235000	250000	45	11.4	5.9
850000	500000	220	20.6	5.4	40000	100000	125	4.8	7.3	305000	300000	50	7.4	9.1
1120000	700000	230	19.4	5.8	67000	200000	130	4.1	8.7	385000	765000	55	6.1	11.1
1420000	1000000	240	17.2	6.5	102000	400000	135	3.1	11.5	485000	1000000	60	5.9	11.5
1760000	1350000	250	15.8	7.1	142000	600000	140	2.9	12.3	585000	1250000	65	5.7	11.9
2160000	1690400	260	15.5	7.2	181000	800000	145	2.8	12.7	690000	1396000	70	6.0	11.3
2400000	1995200	265	14.8	7.7	232000	1000000	150	2.8	12.6	795000	1550000	75	6.2	10.9
2640000	2300000	270	13.9	8.0	282000	1221460	155	2.8	12.7	900000	1700000	80	6.4	10.5
2544000	257MOP	268Normal Pool			307000	1300000	157.5	2.9	12.4			70MOP		
					333000	1463000	160	2.8	12.8	837000	77Normal Pool			
					384000	1800000	165	2.6	13.7					
Length	76.4 mi							155MOP		Length	46.0 mi			
					333000			160Normal Pool						
							Length	24.1 mi						
					113993.8	200000								
Comparison														
2544000	200000		153.9	0.7	333000	200000		20.1	1.8	837000	200000		50.6	1.3
2544000	207923		148.0	0.8	333000	207923		19.4	1.8	837000	207923		48.7	1.4

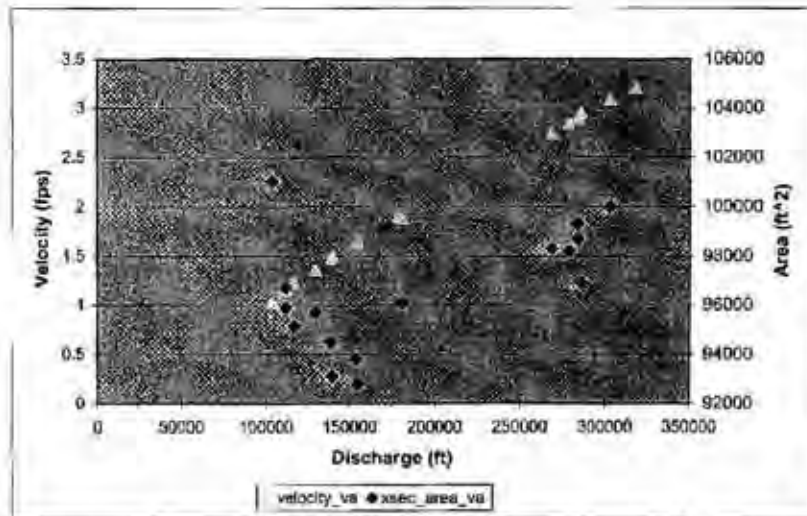


Figure 4-3. Discharge-Velocity-Area Rating Curve, USGS Columbia River at The Dalles Gauge (14101500)

The analysis results show that velocity increases with streamflow and that there is a strong correlation between these variables (r -squared equals 0.997). The velocity at 100,000 cfs is about 1.0 foot-per-second (fps). The velocity at 318,000 cfs is about 3.2 fps. With the maximum Banks Lake flow augmentation of 7923 cfs, the velocity increase at the 100,000 cfs and 318,000 cfs levels would be less than 0.05 fps, which is about a 1.5 to 5.0 percent increase.

The Corps' HEC-5Q model data showing reservoir stage, volume, and discharge were used to determine residence time. Table 4-2 shows these data and the corresponding residence times for reservoirs upstream of John Day, The Dalles, and Bonneville dams. The discharge data are the maximum outlet capacity for the given stage. The estimate of residence time using these data represents the lower limit. The estimate of velocity using these data represents the upper limit. The reservoirs could be operating at a higher stage for the discharges given, which would result in a greater residence time and lesser velocity.

The comparison of velocities measured by the USGS downstream of The Dalles with the velocity calculated using the Bonneville HEC-5Q data show that measured velocities are lower. This confirms that the calculated velocities represent the upper limit. To better estimate actual velocity and water particle travel time, the McNary flow objective was used for discharge along with the reservoir volume at normal operating pool level. These data were used to demonstrate the level of the effect of Banks Lake flow augmentation on

water particle travel time in the lower Columbia River. The approximate residence time through the three lower Columbia River reservoirs at 200,000 cfs is about 224.7 hours (see Table 4-2). With the maximum flow augmentation from Banks Lake, the approximate residence time would be about 216.1 hours, which is about a 3.8 percent decrease.

Average velocity through the lower Columbia River was computed by the CRISP model. The model simulated fish survival for five different Banks Lake drawdown scenarios. According to the CRISP model, water velocity affects fish survival in reservoirs. The computed velocities for each lower Columbia pool and the reaches downstream of Bonneville Dam were averaged for comparison of the drawdown alternatives. Table 4-3 shows the Bonneville pool velocities, and average velocities through the lower Columbia River, for the five drawdown scenarios for three different flow conditions: average, high, and low. The discharges modeled for these scenario-flow-condition combinations ranged from about 110 kcfs to 216 kcfs. The computed Bonneville pool velocities ranged from 1.03 to 1.83 fps. These velocities and discharges closely match the velocity-discharge relationship at the USGS monitoring station downstream of The Dalles. Therefore, the CRISP model appears to be accurately estimating velocity.

CRISP model results indicate that the changes in average velocity with respect to the base case (scenario UD5) were about the same for each flow conditions—an increase of about 0.013 fps—except for the LW scenario. Under that scenario, velocity decreased with respect to the base case, but with the same insignificant magnitude as under the other scenarios. These results indicate that the 10-foot drawdown would reduce water particle travel time between McNary and Bonneville dams by at most 1 hour of a 9-day travel time (Van Holmes and Anderson 2003).

This result should be considered in the context of model uncertainty. Per the draft EIS Appendix C discussion, a 5000 cfs compensation for model uncertainty at the 200,000 cfs level represents an uncertainty of 2.5 percent. This uncertainty is only 1.3 percent less than the percent decrease in lower Columbia River reservoir residence time resulting from the Banks Lake flow augmentation.

Table 4-3. CRISP Computed Velocities

Flow Condition	Location	Velocities in ft/s				
		ED10	LD10	LW	UD10	UD5
Average	Bonneville_Pool	1.424	1.428	1.390	1.426	1.408
	Average Velocity	0.997	0.999	0.973	0.999	0.986
	Δ from base (UD5)	0.011	0.014	-0.013	0.013	
	Bonneville_Pool	1.826	1.829	1.791	1.828	1.810
High	Average Velocity	1.278	1.281	1.254	1.280	1.267
	Δ from base (UD5)	0.011	0.013	-0.013	0.013	
	Bonneville_Pool	1.065	1.068	1.030	1.067	1.049
	Average Velocity	0.751	0.753	0.727	0.753	0.740
Low	Δ from base (UD5)	0.011	0.014	-0.013	0.013	

5. RESIDENT FISH ISSUES

Resident fish and their associated habitat are one of the major resources that will be affected by the alternatives. In general, Reclamation describes the existing condition of a broad range of resources and potential impacts to these resources. However, it appears that the magnitude and risk of impacts to these resources may be more severe than characterized in the draft EIS. Also, the impacts of the No-Action Alternative appear to be understated in general. While the No-Action Alternative activities have already been implemented, they are new reservoir conditions as they represent a change from what has normally occurred over the last 20 years of operations. Drawdown of 5 feet in August has been the exception, not the norm.

The full effects to reservoir resources from this action are not yet known because shoreline changes will continue to occur annually until the shorelines are stabilized (see soils impacts section of the draft EIS). Changes to the shoreline need to be brought out more clearly in the analysis of the impacts. While drawdown may be considered to have some benefits to the resources of interest, dewatering of littoral areas is rarely considered to have a net gain for aquatic resources (Ploskey 1983). Drawdown will generally kill macrophytes, at least in the short term, and eliminate their use as cover for fish during the drawdown period. The shoreline erosion that will occur from more exposed areas will increase turbidity, if only temporarily, possibly reducing primary production in the short term. The dewatered littoral areas, which typically are the highest production areas of lakes, whose levels do not fluctuate, may well experience a change in benthic resource composition, possibly losing benthic organisms that are important as fish food resources (Ploskey 1983). Movement of fish to deeper offshore water during high temperature periods may increase predation of prey resources and possibly important game species.

The drawdown will also reduce total lake volume to about 87 and 75 percent of full pool volume for the 5-foot and 10-foot drawdown, respectively. The net effect, although for short periods, would be concentration of the resident fish into a reduced area during the warmest period of year when food demand would be at its highest. The result is not clear at this time, but has the potential to be detrimental. The U.S. Fish and Wildlife Service (USFWS) noted that a 10-foot drawdown would cause ideal rearing habitat for some species to be "vastly reduced," that shallow vegetative structure would be changed, and that increased predation of prey species would occur (USFWS 2002, Attachment A). While the effects of a 10-foot drawdown would be more severe, similar types of effects will likely occur even with some of the 5-foot drawdown scenarios being considered. We have noted in following sections where we think adding information concerning some of these effects would aid the document.

5.1 DRAFT EIS CHAPTER 3

Page 3-10, Under FISH

1st Paragraph: Check fish genus species names; some are in error. Also supply genus species name for burbot.

2nd Paragraph: Effects to lake whitefish need to addressed in the analysis of the effects of drawdown. Also the citation should be Stober et al. 1976.

Thomas (1978) noted that drawdown likely affected feeding habitats for lake whitefish and yellow perch. The result was that these fish relied more on pelagic zooplankton than benthic invertebrates than was expected based on known feeding characteristics. He suggested this might have been caused by low littoral benthic invertebrate abundance, possibly from large drawdowns that occurred during his studies. This type of feeding behavior was noted by Thomas (1978) in other reservoirs with drawdown. According to Thomas (1978), the reliance of lake whitefish and yellow perch on zooplankton in Banks Lake puts them in competition with kokanee for food resources.

Page 3-12, Table 3-3

Kokanee and lake whitefish should be included in the table. Kokanee, which historically were very abundant in Banks Lake, are currently still receiving much attention by the Washington Department of Fish and Wildlife (WDFW) through an intensive stocking program. Lake whitefish, while not a major game species, was (Thomas 1978), and likely still is, the largest fish biomass in Banks Lake.

Information from Thomas (1978) should be directly cited when discussing some of the characteristics of the species on this list. Site-specific information is better when

available. For example, kokanee were reported to spawn in 1 to 8 meters of water along the shoreline of Banks Lake.

5.2 DRAFT EIS CHAPTER 4

Page 4-9, No-Action Alternative

The impacts of the No-Action Alternative appear to be understated based on the data presented. Two of the four scenarios have water levels down to 1,565 feet for 21 to 31 days. The littoral area would therefore be exposed during what is typically the hottest and driest periods of the summer. Another scenario would have about half of this area exposed for at least 15 days. In the subsection on susceptibility of juvenile fish to predation, it was noted that the reservoir level would remain "at or above 1,565 elevation through August, keeping emergent vegetation available to juvenile fish for cover and protection from predation." But, according to the vegetation discussion, all of the emergent vegetation is found above 1,566 feet, which would imply that much of this habitat would not be available through much of August. As indicated in Section 3, aquatic vegetation is used by many fish life stages and is highly productive for benthic invertebrates. Additionally, benthic invertebrates in the littoral areas are typically the most diverse and productive in lake and reservoir systems (Ploskey 1983). The discussion of fish feeding habits notes that benthic invertebrates are often major food sources for fish found in Banks Lake. This likely includes rainbow trout as well as other important game fish. Studies have noted that in some reservoirs, the diversity of invertebrates in drawdown areas is greatly reduced and many of the taxa lost are those most often consumed by fish (Ploskey 1983).

It appears that drawdown under at least some of the No-Action Alternative scenarios would adversely affect each of the three habitat/life stage categories noted.

Page 4-10, under "Shallow Emergent Vegetation"

In general, the conclusion appears correct. As was noted earlier in the draft EIS, the abundance of some plants like pondweed may be reduced. While long-term effects on plant communities may generally require extended desiccation (i.e., greater than 3 months, Ploskey 1983), these communities would be lost for the season as it is unlikely that plants would regrow in the fall once the water level is returned to full pool. However, it seems probable that the amount of vegetation, especially in the shallowest water, would be reduced because the exposure period would be longer. Even plants that are somewhat tolerant to desiccation may be affected. The USFWS noted this in its CAR report (Attachment A). If drawdown extends into the falls, the emergent vegetation

would likely suffer even greater impacts. Therefore, plant community structure and distribution may be altered from the Proposed Action, especially if lake levels remain low.

Page 4-10, under "Shallow Unvegetated Flats"

The drawdown should be referred to as a 10 foot drawdown, not a 5-foot drawdown.

While similar habitat morphology would replace that lost, the production of benthic resources of the region will be reduced because the greatest diversity of benthic resources is generally present in the littoral regions (Ploskey 1983), which is the area being dewatered.

The soils section (page 4-42) should be referred to in assessing the likely effects of drawdown. That section notes the potential for loss of vegetation and disturbance of spawning beds from soil erosion. The soil section indicates that the erosion will occur at the lake surface elevation. While the lake surface elevation may be at 1,560 feet for only 30 to 40 days, wind and wave action, either from natural conditions or boats and other water craft, would cause increases in erosion not often experienced in the past. The increased erosion has the potential to increase turbidity and reduce primary production, as well as affect benthic production within the wave area.

Page 4-11, under "Centrarchidae"

Black crappie is an abundant and popular recreational species in the lake (Stober et al. 1977, Reclamation 2001); black crappie juveniles remain near shore. Other centrarchids such as pumpkinseed are also typically present in the shallow vegetative areas of the lake. Loss of vegetative cover would expose these fish to greater predation. Another important point related to predation is that the food requirements of cold-blooded animals are a function of temperature. August typically contains some the warmest water temperatures of the year, with surface temperatures typically near 18 to 20°C (Knutzen 1977). The effect is that, in order for a predator to maintain growth during warmer periods, it will need to consume a much higher number or biomass of prey. For example, the consumption rate of largemouth bass doubles between 15 and 20°C, with the near-maximum consumption rate at 20°C (Coutant 1975). Increased consumption was demonstrated in the John Day Pool by northern pikeminnow consuming about four times the biomass of salmonid prey in July and August than they did in May and June when temperatures were much cooler (Poe et al. 1991). While the period of displacement of juveniles from the littoral areas may be relatively short, it will occur during a period when predators will have high-energy requirements, and are likely to have high predation rates.

Page 4-11, Last Paragraph

One other factor not noted that will also affect predation within the system is total reservoir volume and surface area. A drawdown of 5 feet and 10 feet from full pool (1,570 feet) will reduce Banks Lake volume to 87 and 75 percent of full pool volume. Total reservoir surface area will also be reduced but likely not to the magnitude of the volume due to steep banks along much of the shoreline. These reductions would also affect predation, which is not dependent only on changes in shoreline cover. In effect, all predators and prey will be concentrated in a smaller area and in a smaller volume during a high-temperature, energy-demanding period. This will contribute to greater predation rates on many of the young-of-the-year and probably on larger fish also, including those that have moved away from the shoreline, making them more susceptible to major piscivorous predators like walleye and bass.

Page 4-12, 2nd and 3rd paragraph

See comments on page 4-11

The analysis appears to suggest that predation pressure may be significant for some species within the system due to the duration, timing (during high temperatures), and magnitude of the action. Even the smaller drawdown period of the No-Action Alternative, if maintained for the longer periods, differs from what has occurred in the past and may cause adverse effects to some of the lake fish population, such as crappie, other sunfish, and possibly yellow perch. It may also increase the growth of predator species, such as walleye and smallmouth bass. Such occurrences have been noted with minor reservoir drawdowns in late summer (Ploskey 1986, Groen and Schroeder 1978). The net effect is likely to be adverse, however, as it may well alter the current fish population structure in the lake, with potentially positive and negative effects to different game and prey species. If refill of the lake is delayed into the fall, these impacts would increase as the drawdown duration increases.

Page 4-12, Benthic Invertebrates

Drawdown will adversely affect major fish food resources in the reservoir. The shallow shoreline areas are typically the regions with the highest benthic production and abundance in lakes (Ploskey 1983). These areas, because they are in the photic zone, grow macrophytes where substrate is suitable, but also grow attached periphytic algae. Both macrophytes and periphyton supply a food source and attachment areas for benthic invertebrates. Drawdown for the period being considered will reduce access by fish to these littoral resources and additionally eliminate much of the production of this area as a benthic food source for the fish, lasting for a period after the reservoir refills. Thomas

(1978) noted that in Banks Lake, yellow perch relied heavily on zooplankton as opposed to benthic invertebrates, which is more common in many other systems. This may have been partly a result of low benthic abundance from extensive drawdowns during his study periods. He noted that benthic studies conducted along the Banks Lake shorelines indicated a reduction in abundance in the drawdown zones of the lake, with the highest benthic organism abundance below the maximum drawdown depth. Within the same year, however, abundance levels appeared to increase substantially in the drawdown areas if additional drawdown did not occur (Thomas 1978). He also suggested that the restriction of the main fish food source to small zooplankton may well have been a factor in the slower growth of yellow perch and the reduced longevity of both yellow perch and lake whitefish, which feed on zooplankton almost exclusively in Banks Lake.

Reservoir aging may be affecting overall production within Banks Lake (Korth 1996). Although other factors, such as increased predation, may have contributed to the loss of the once highly abundant kokanee, their lack of success in sustaining their high abundance and good growth may be partly the result of the aging of this reservoir and a resulting decline in food production. If these are major factors, any additional loss of food sources in the system may well contribute to a further reduction in overall fish production, either from direct loss of food resources or increased competition for the major remaining food base, zooplankton.

Page 4-13, 2nd Paragraph

A change in fish composition and abundance in Banks Lake appears to be a possibility if the 10-foot drawdown is implemented. Maintaining the existing fish abundance with a 10-foot or even the 5-foot drawdown is questionable. The reservoir may well be suffering from overall reduced production as a result of aging, and, as you noted, other studies have shown that drawdown does affect production of fish resources. In its Coordination Act Report (Attachment A of the draft EIS), the USFWS concurred that several adverse effects would occur to fish and fish habitat from a 10 foot drawdown (Page 24 of Attachment A). USFWS noted that ideal rearing habitat would be "vastly reduced," that vegetative structure and shallow water habitat would also be reduced, and that the quality of habitat for cover from predators would be "vastly lowered." They noted a loss of fish habitat in Osborn Bay and other important protected areas during the period of drawdown, loss of vegetative structure, die back of several macrophytic and other plant species, increased fish predation, and a large loss of the forage base of fish forced to deeper water as a result of drawdown. The USFWS concluded that the level of predation would increase as a result of the drawdown. It appears to us that even the 5-

foot drawdown of the No-Action Alternative, if maintained for the longer periods, would have similar impacts, although at somewhat reduced levels.

While the USFWS notes several potential mitigation measures to help offset these impacts, it is not clear that they would ultimately mitigate for the impacts of this action.

Pages 4-13 to 4-15

Slight changes in water temperature from the drawdown may have significant effects, under the right conditions, on some abundant and important fish stocks. We agree that the overall water temperature effects are not likely to be large. However, lake whitefish and kokanee are two fish that could be adversely affected by increasing lake temperatures in August. During August, lake thermal heating has typically been at its maximum (Knutzen 1977). While the surface temperature may peak in July, the highest bottom temperatures, particularly in the south pool, are at their highest in August. While we have seen no predictions of the magnitude of the changes in temperature that would result from the drawdown, the temperature in the lake would undoubtedly increase for several reasons: first, no cool water would be pumped into the lake from Lake Roosevelt; second, irrigation withdrawal would be taking water from the cooler mid to deep water of the lake, leaving the warmer surface water; and, third, there would be a reduced body of water to absorb solar heating.

Lake whitefish likely are one of the highest biomass fish in Banks Lake. Past studies have found that lake whitefish are nearly absent from the main lake body, with vast numbers of these fish migrating to the Devil's Punchbowl area in the hottest part of summer to avoid high lake temperatures. In fact, they have been found to concentrate in regions of very low oxygen (3 mg/l), a stressful dissolved oxygen level, to avoid the higher lake temperatures that occur throughout the lake at this time (Stober et al. 1977). Lake whitefish are already stressed at this time of the year because of high temperatures. Should this drawdown occur during an extremely hot August, the effects to these fish could be significant if they are unable to find adequate refuge from high temperatures. Whether this would be considered a positive or negative effect on the Banks Lake fish resources is debatable, since few people fish for them and because of their high abundance, they consume a large share of the limited food resources) but it would certainly be a very negative effect to the species.

Kokanee, while now primarily maintained through stocking, are often temperature-stressed during the warm summer months in Banks Lake (Thomas 1978). Their optimum temperature is closer to 12 to 15°C, depending on food supply (Brett 1952), while in August, the near-bottom temperatures have typically been over 16°C in most of the south

pool lake bottom and over 18°C on the surface. Even moderate temperature increases in August would be detrimental to this stock.

It should be noted that some species, such as smallmouth bass and walleye, have optimum growth at higher temperatures and may benefit from warmer water if they are able to maintain sufficient food intake.

Page 4-13, Table 4.2

Items in the No Action column are not "impact(s)" as the title states. The No-Action Alternative scenarios have impacts over historical operations. Please enter these in the table. A few examples are presented below.

Page 4-13, under "Shallow Aquatic Emergent Habitat"

According to the plant discussion, this topic includes submergent vegetation also, such as Pondweed species.

- No Action – Note that there will be some temporary seasonal loss of submergent vegetation from desiccation
- Action – Note that there will be seasonal loss of access by nearshore fish stocks

Page 4-13, under "Shallow Unvegetated Flats"

- No Action – Note that there will be a loss of littoral benthic production in the short term
- Action – Note that there will be reduced benthic diversity and potential fish food resources

5.3 DRAFT EIS CHAPTER 5

Page 5-5, last two paragraphs

While studies may be good for determining effects, there is no indication of what will be done if the impacts are considered significant and the only mitigation would be to change back to the previous way of operating. Would Reclamation consider changing operations back (i.e., reduced August drawdown) if drawdown was found to have unacceptable impacts even after implementation of the mitigation included in the draft EIS? Should reverting to the previous operating scenario be added to the list of mitigation measures?

Page 5-6, 5th bullet

Many fish species are not good candidates for hatchery operations. Also, as has been found with kokanee in Banks Lake, once a species has problems in a system, it is difficult

to have success at achieving the former conditions. As has been well documented in the Columbia River system for salmon and steelhead, hatcheries have not been the answer that many intended them to be. While resident fish populations are a different story, the lessons are similar.

The point is that if impacts do occur to fish resources and their habitat in Banks Lake, and they likely will from either alternative, the mitigations being proposed may well not be adequate to mitigate for the affected fish habitat population conditions. The actions being considered have risks to the resources of interest in Banks Lake that may not be fully evaluated.

5.4 SUMMARY

The primary points of the review of the Resident Fish sections were noted in the introduction to this section and will be summarized briefly. Overall impacts to resident fish and their habitat are well discussed and referenced in the draft EIS. However, our review of the information suggests areas where the level of impact may differ from that presented and a few areas where Reclamation may need to expand or modify its discussion. The major points are noted below.

- The impacts that would result from the No-Action Alternative scenarios need to be discussed more fully. In several areas, the effects of these scenarios are not differentiated from historical operations (see Section 2 of this document).
- Some of the No-Action Alternative scenarios have the potential to adversely affect submergent and emergent vegetation compared to historical operations. These adverse affects would result from exposure of area where this vegetation grows from 21 to more than 30 days. This exposure would reduce any benefit to fish resources. Benthic resources, important as food for fish, would also be affected by "No-Actions," although at a lower level than would occur under the 10-foot drawdown associated with the Action Alternative scenarios.
- The Action Alternative scenarios pose a greater risk of adverse effects to lake fish resources. Some vegetation would be adversely affected, juvenile fish would be subjected to greater predation from a loss of habitat during a period of high-food demand, and the overall habitat area will be reduced, at least for the short term.
- The level of effects of the Action Alternatives on fish appears to be greater than noted in the draft EIS, as indicated by statements in the USFWS CAR report.
- Summary tables need to include the impacts of the No-Action Alternative scenarios as well as the Action Alternative scenarios.

- The proposed mitigation (e.g., studies of effects, use of hatchery, fish habitat enhancement) may not be adequate to offset impacts,

6. OTHER ISSUES

6.1 DRAFT EIS CHAPTER 3

Page 3-1

Reclamation makes substantial use of the Banks Lake Resource Management Plan (RMP) of March 2001 in characterizing the affected resources indicated on page 3-1; however, the environmental conditions of those resources are different than those of today (drawdown years 2001 and 2002) and beyond, as described under the No-Action Alternative. Based on Figure 2 of Appendix C, August water levels in Banks Lake from 1981 to 2000 were above elevation 1,565 feet over 95 percent of the time. Therefore, using resource characterizations that were based on that historic lake level regime represent a different set of resource conditions than those conditions that would be realized under the No-Action Alternative, which would lead to a higher frequency of August days reaching elevation 1,565 feet. The EIS should highlight the condition of each specific resource in years 2001 and 2002 to describe how the resources were actually affected in years when the reservoir was operated in a manner similar to the No-Action Alternative.

Page 3-4 and Table 3-1

Pondweed, duckweed, and Eurasian water milfoil are not true emergent plants. They are macrophytes that remain floating on or below the water surface.

Page 3-32

The description of existing hydropower resources should include the historical operation of the pump/generation units for power production. The Grand Coulee Operations Office reported that between Banks Lake elevations of 1,570 feet and 1,568 feet, all six units can run. Below 1,568 feet, one unit drops off with the loss of every 1.5 feet in Banks Lake elevation. At the present time, Reclamation operating criteria allows for no generations below elevation 1,567.5 feet (John O'Callaghan, Reclamation, personal communication February 13, 2003). The total August power generation flows through the units for the period 1992 to 2002 ranged from 0 (6 out of 11 years) to 2,015 second-feet-day (sfd) in 1997. Figure 4 of Appendix C of the draft EIS shows that during August 1997, the Banks Lake elevation exceeded the 1,567.5-foot power generation cut-off level.

Page 3-34

It is stated that "any impacts on the economic environment from the Action Alternative due to changes in recreation use of the lake would be expected to occur in Grant County." However, on page 3-37, it is stated that both local residents and people who generally travel 100 to 200 miles use the area. It goes on to state that most out-of-area users are from the Puget Sound (Seattle/Tacoma) area. Clearly, if many users are from the Puget Sound area, then any changes in recreation use would lead to some economic effects in areas outside of Grant County, where many of these visitors reside. Many studies have shown expenditures for recreation trips start in the place of origin and include spending along the way, both to and from the destination. In the case of water skiing, decisions to spend several thousands of dollars on boats could be made based on perceived opportunities to use such equipment on reservoirs like Banks Lake. If potential users feel constrained in their opportunities to boat because of low pool conditions during the prime summer month of August, their capital expenditures for recreation equipment may also be constrained, thus affecting other industries throughout the area.

6.2 DRAFT EIS CHAPTER 4*Page 4-1, Last Paragraph*

The range of depth report for the littoral region seems narrow. Is this the depth where macrophytes grow, or only where emergent vegetation grows? It appears the definition used here would be considered the upper littoral if significant macrophytes are present below this depth (Wetzel 1975). Based on Figure 4-1 in the draft EIS, it appears that the definition used refers only to the emergent plant zone. If macrophytes are present in moderate abundance below 1,566 feet, the depth to which they extend should be included as part of the littoral zone.

Page 4-5, 1st Paragraph

While in general this statement appears correct, effects to pondweed may be significant under some of the No-Action scenarios. The USFWS Coordination Act Report (see Attachment A) noted plant loss of some of these species from drawdown.

Page 4-5, 4th Paragraph

If pondweed and duckweed are affected by drawdown, would it not constitute a change in "structure and function" of the aquatic vegetation?

Table 4-1

The descriptions under No-Action Alternative need to indicate the impacts that would result from this alternative. For example, under pondweed and duckweed, no impacts are disclosed. Compared to historical operations, there would be impacts to these species even under the No-Action Alternative.

Page 4-9

Under the No-Action Alternative, there clearly would be some effects to fish resources that are different from the historic conditions to which these fish have adjusted.

Page 4-20

The geographic scope of the impact assessment of hydropower resources includes power generation facilities downstream of Grand Coulee Dam. This geographic area was not included in the fish resources impact assessment. There should be consistency in the geographic scope of all resource impact assessments.

Page 4-21

The reference to BPA's 2002 Final Power Rate Proposal Marginal Cost Analysis Study is (May 2000). This reference should be corrected. If the actual date of the document is 2000, then the information should be updated to reflect current economic conditions.

The FCRPS impacts should describe what the change from historical power generation would be under the No-Action and Action Alternative scenarios. For example, the operation of all six pump/generation units would be cut off for both alternatives. In 1997, the power generation reduction associated with the loss of 2,015 second-foot-day (sfd) generation flows in 1997 should be reported as the greatest change from historical operations.

Page 4-27

The No-Action Alternative is not presented under Regional Local Economy.

Page 4-31

In Recreation, it is stated that, "historically, elevation changes to Banks Lake have an effect on the availability of recreational resources surrounding the lake. Under the No-Action Alternative, there are no additional effects on the current recreation opportunities at Banks Lake." However, because Banks Lake level only drops below 1,565 feet 5 percent of the time (see Appendix C, Figure 2) in August, there would indeed be some adverse effects resulting from implementing the No-Action Alternative.

Page 4-32

Under Recreation Visits, it is stated that "a degree of difficulty regarding watercraft access may be present at water elevations below 1,565 feet." However, as with most boat launching and access facilities, there is always some difficulty with any site and elevation. The statement as it is currently worded is therefore meaningless. If 7 out of 12 boat ramps become unusable at 1,565 feet (page 2-11), then the impact is large enough to warrant consideration as a significant impact. If 10 out of 12 boat launches are rendered unusable at elevation 1,562 feet under the Action Alternative, then the impact to boating in August would be significant.

Page 4-41

It is stated under "Visual Quality" for the No-Action Alternative that the visual quality of Banks Lake will not be affected. However, the lake is going to be operated differently than it has for the past 20 years (see 1981-2000 frequency of lake levels shown in Figure 2 of Appendix C of the draft EIS). Under the "Lake Classification" of the State of Washington water quality regulations, the reservoir should support beneficial uses, including "recreation for primary contact, boating, sport fishing, and aesthetic enjoyment" (Page 3-48). Because the lake will be operated at a slightly lower level than it has in the past, there would be some adverse effect on visual quality under the No-Action Alternative due to an increased presence and duration of exposed shoreline in the drawdown condition below elevation 1,570 feet.

Under the Action Alternative, the analysis concludes there will be a "minimal" visual quality effect "because of the 5-foot strip of bare land during the drawdown period." This is highly inaccurate, since the strip of land is much more than 5 feet in width at all locations. Furthermore, this conclusion is not supported by other conclusions found throughout the draft EIS. For instance, in the Vegetation Section, it is stated that the littoral zone will be exposed from anywhere between 21 and 41 days, which would be during the high-use recreation season. This effect is certain to present more than a "minimal effect" on visual quality. Under "Soils" for the No-Action Alternative, erosion of the shoreline between elevation 1,570 and 1,565 feet would be in "previously undisturbed areas" that "would cause mechanical disturbance to the soil surface and destruction of the protective vegetative cover including vascular plants and soil stabilizing microbiotic soil crusts." To further support that there is more than just a "minimal effect," it is concluded on page 4-32 that "at lower lake levels, sandy beach areas may be far from the water's edge with unattractive and unappealing mud flats being exposed." All of the effects are related in that they take place in the drawdown zone of the No-Action Alternative. Beyond the simplistic analysis found in the EIS, more effects

would be found by performing a simple analysis in the field using key viewpoints to document viewsheds at the various lake levels in order to fully characterize the extent and magnitude of the effects.

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ATTACHMENT A
**LOWER COLUMBIA RIVER MODELED SALMONID SURVIVAL
AND WATER VELOCITIES UNDER PROPOSED BANKS LAKE
AUGUST DRAWDOWN SCENARIOS**

LOWER COLUMBIA RIVER MODELED SALMONID SURVIVAL AND WATER VELOCITIES UNDER PROPOSED BANKS LAKE AUGUST DRAWDOWN SCENARIOS

Chris Van Holmes and Dr. James Anderson

March 17, 2003

The NMFS 2000 Biological Opinion directed in their Reasonable and Prudent Alternatives (#23 and #31) that the drawdown of Banks Lake be considered in August to enhance flows in the lower river to help meet the objective of 200 kefs at McNary Dam in August. The intent of achieving of 200 kefs, as indicated in the Biological Opinion, was to benefit "subyearling Chinook salmon in the lower Columbia River." As part of the review of the US Bureau of Reclamation's Banks Lake Drawdown Draft Environmental Impact Statement, Columbia Basin Research (CBR) modeled the effects of the flow contributed from the Proposed Actions on downstream anadromous endangered species units: native Snake River fall chinook, Lower Columbia chinook and, potentially, the Snake River spring chinook and steelhead. Unlisted naturally spawning Hanford Reach fall chinook are also included in the analysis.

The impacts of Banks Lake flows were simulated with the Columbia River Salmon Passage model (CRiSP) by altering the equivalent flow from Grand Coulee Dam (the source of water for Banks Lake). CRiSP predicted survivals, travel times and water velocities over a range of Banks Lake outflow scenarios resulting from scenario drawdowns.

Scenarios

The drawdown scenarios were modeled under three flow regimes of average, high, and low flow years as determined by HYDROSIM modeling. The base case was established as the Northwest Power Planning Council's BIOP HYDROSIM model for the 1960 (average), 1974 (high), and 1977 (low) water years. These modeled flows incorporated the 5-foot uniform draft of Banks Lake from 1,570-1,565 during the month of August, representing a flow augmentation of 2,173 cfs. Adjustment of Grand Coulee outflow was made to these modeled flows to represent 4 additional drawdown scenarios. The drawdown scenarios analyzed are presented in Tables 1 and 2.

All scenarios were run with the same stock release schedules, headwater dissolved gas levels, water temperatures and transport schedules with the exception of using 2001's water temperatures and full transport at Snake River projects in the low flow scenarios to more closely model warm conditions and low flow transport operations.

Table 1. Flow Scenario for Banks Lake Drawdown Study

Drawdown Scenario	Scenario Description	Δ from Base Case (cfs)	
		Aug 1-15	Aug 16-31
UD5	Uniform Draft at Banks lake from elevation 1,570 to 1,565 spread evenly throughout August	Base Case	
LW	Low Water – Banks Lake held at elevation 1,565 through August	-2173	-2173
UD10	Uniform Draft – 10 ft of draft at Banks lake from elevation 1,570 to 1,560 spread evenly throughout August.	2069	2069
ED10	Early Draft – 10 ft of draft at Banks Lake from elevation 1,570-1,560 during first ½ of August	5750	-1383
LD10	Late Draft – 10 ft of draft at Banks Lake from elevation 1,570-1,560 during last ½ of August	-705	4577

Release Sites

Snake River stocks were released at the Snake Trap at the head of Lower Granite pool. Upper Columbia spring chinook and steelhead were released in the Rock Island Dam tailrace. Hanford Reach fall chinook were released at river kilometer 590, the average release location of PIT-tagged wild Hanford Reach fall chinook. All stocks were modeled through the Bonneville Dam tailrace as well as the estuary. Modeled release timing was determined by averaging actual passage timing at each release site over the past 10 years.

Model Description

CRISP.1 models passage and survival of multiple salmon stocks through the Snake and Columbia rivers, their tributaries, and the Columbia River Estuary. The model recognizes and accounts for several aspects of the life-cycle of migratory fish—fish survival, migration, and passage—and their interaction with the river system in which they live.

Fish Survival through a dam depends on:

- Spill percent and spill efficiency
- Turbine, spill, and bypass mortality estimates
- Fish Guidance Efficiency

Fish survival through reservoirs depends on:

- Predator density
- Temperature dependent predator activity
- Spill dependent total dissolved gas (TDG) super saturation levels
- Travel time through the reservoirs.

Fish migration rate depends on:

- Smolt age.
- Migration experience.
- Flow-dependent water velocity.
- Day of migration season.

CRISP.1 computes daily fish passage on a release-specific basis for all river segments and dams. Passage and survival of fish through a reservoir is expressed in terms of the fish travel time through the reservoir, the predation rate in the reservoir, and a mortality rate resulting from fish exposure to total dissolved gas supersaturation, an effect called gas bubble disease (GBD). Fish enter the forebay of a dam from the reservoir and may experience predation during delays due to diel and flow related processes. They leave the forebay and pass the dam mainly at night through spill, bypass or turbine routes, or the fish are diverted to barges or trucks for transportation. Once they leave the forebay, each route has an associated mortality rate and fish returning to the river are exposed to predators in the dam tailrace before they enter the next reservoir. CRISP.1.6 integrates a number of submodels that describe interactions of isolated components. Together they represent the complete model.

Travel Time

The smolt migration submodel, which moves and spreads releases of fish down river, incorporates flow, river geometry, fish age and date of release. The arrival of fish at a given point in the river is expressed through a probability distribution.

The underlying fish migration theory was developed from ecological principles. Each fish stock travels at an intrinsic velocity as well as a particular velocity relative to the water velocity. The velocities can be set to vary with fish age and experience. In addition, within a single release, fish spread as they move down the river.

PIT-tagged data over the past 10 years was used to calibrate the travel time parameters for Rock Island, Hanford Reach, and Snake River trap releases through the tailrace of Bonneville dam. Post-Bonneville migration is an extension of these migration parameters through the estuary but no travel-time data past Bonneville was available for the calibration.

Predation Rate

The predation rate submodel distinguishes mortality in the reservoir, the forebay, and the tailrace of dams. The rate of predation depends on temperature, smolt age, predator density and reservoir elevation.

The predation rate parameters were calibrated using laboratory studies of the response of predators to temperature and field studies of smolt migration survival. The model is calibrated for spring and fall chinook salmon and steelhead from the Snake River Basin and the Upper Columbia River Basin using NMFS published survival data through Bonneville dam. Wild Hanford Reach fall chinook salmon were calibrated using survival estimates through Bonneville generated from PIT-tag release and observation data (Ptagis) available at Columbia Basin Research's DART web pages. Post-Bonneville predation is an extension of

these parameters through the estuary but no survival data from below Bonneville was available for calibration.

The calibrated predation rate parameters for Snake River fall chinook salmon were used as a surrogate for Lower Columbia fall chinook salmon as no PIT-tag migration or survival data is available for this stock.

Gas Bubble Disease

A separate component of the mortality submodel is mortality from gas bubble disease produced by total dissolved gas (TDG) supersaturation. The mortality rate is species specific, and it is adjusted to reflect the relationship of fish length and population depth distribution to TDG supersaturation experienced by the fish. The gas bubble disease rate is calibrated from laboratory studies.

Dam Passage

Timing of fish passage at dams is developed in terms of a species dependent distribution factor and the distribution of fish in the forebay. The model uses the current best estimates of fish guidance efficiency (FGE), spill efficiency, and route specific mortalities as incorporated into NMFS's Simpass model.

Transportation Passage

Transportation of fish at collection dams is in accordance with the methods implemented by the U.S. Army Corps of Engineers. Low flow years employ full transport at Snake River projects.

Total Dissolved Gas Supersaturation

Total dissolved gas (TDG) supersaturations are described by mechanistic models, which include information on geometry of the spill bay and physics of gas entrainment. The TDG generation equations used for gas production include the newest developments by U.S. Army Corps of Engineers, Waterways Experiment Station (WES) as well as additional work done by Columbia Basin Research. The gas calibration has been verified for 13 dams for the years 1995 through 2001.

Flow

In these scenarios, flow is specified at dams using results of system hydro regulation models and historical flows as provided by the NPPC for the years 1960, 1974 and 1977. Augmentation scenarios are developed by adjusting Grand Coulee outflow volumes.

Water Velocity

Water velocity is used in CRISP.1.6 as one of the elements defining fish migration. Velocity is determined from flow, reservoir geometry and reservoir elevation.

Results

Spring migrants are not affected by the modeled August flow adjustments because the fish have migrated out of the river system before August.

On a base survival of about 0.5 from McNary Pool and Bonneville Dam the maximum increase in survival from the Banks Lake Baseline drawdown is 0.00001 and 0.00002 for average and low flows. Under high flow conditions the maximum survival increase is less than 0.000005. Removing all Banks Lake drawdown the survival decreases by at most -0.00001. These increases and decreases only occur for Snake River fall chinook salmon and Hanford Reach fall chinook salmon. Banks Lake drawdowns had no effect on spring chinook salmon.

To put these changes in to perspective note that on the average (1992-2002) the total smolt index migrating past McNary Dam in August is 630,000 smolts of all species, of which 99 percent are fall chinook salmon. A Banks Lake drawdown of 10 ft from the early, late or uniform drawdown periods over August would increase the number of smolts reaching Bonneville Dam between by 6 to 13 smolts out of the total of 630,000. In comparison, the total yearly smolt index at McNary Dam is 12 million smolts. The corresponding reduction in travel time between McNary and Bonneville dams is at most one hour on a 9 day travel time. Most scenarios increased travel time to Bonneville Dam by less than 14 minutes on travel times of about 2 weeks.

Table 2. McNary August Flow (kcfs) and Percent Change from Base Case (UD5)

Flow	Flow Period	UD5	UD10	LW	ED10	LD10
Average	Aug 1-15	197.5	199.6	195.3	203.2	196.8
	Aug 16-31	119.4	121.4	117.2	118.0	124.0
High	Aug 1-15	210.1	212.1	207.9	215.8	209.4
	Aug 16-31	200.0	202.1	197.8	198.6	204.6
Low	Aug 1-15	128.8	130.9	126.7	134.6	128.1
	Aug 16-31	111.7	113.8	109.5	110.3	116.3
Average	Aug 1-15		1.04%	-1.11%	2.83%	-0.36%
	Aug 16-31		1.04%	-1.11%	-0.68%	2.33%
High	Aug 1-15		0.98%	-1.04%	2.66%	-0.33%
	Aug 16-31		0.98%	-1.04%	-0.64%	2.19%
Low	Aug 1-15		1.58%	-1.71%	4.27%	-0.55%
	Aug 16-31		1.59%	-1.71%	-1.02%	3.58%

Table 3. Smolt Survivals in Scenarios and Change from Base Case UD5

Scenario	Rel. Site	Stock	Flow	Survival thru BON		Survival thru Estuary		transport fraction	Survival Change from base	
				In-river	Total System	In-river	Total System		Absolute	Percent
ED10	Hanford Reach	Fall Chinook	Average	0.409	0.500	0.310	0.380	0.217	0.00002	0.004%
ED10	Hanford Reach	Fall Chinook	High	0.427	0.516	0.326	0.394	0.222	-0.00001	-0.002%
ED10	Hanford Reach	Fall Chinook	Low	0.395	0.566	0.288	0.412	0.370	0.00001	0.002%
ED10	Rock Is. Tailrace	Steelhead	Average	0.546	0.511	0.482	0.452	0.036	0.00000	0.000%
ED10	Rock Is. Tailrace	Steelhead	High	0.568	0.553	0.513	0.499	0.091	0.00000	0.000%
ED10	Rock Is. Tailrace	Steelhead	Low	0.219	0.289	0.112	0.147	0.237	0.00000	0.000%
ED10	Rock Is. Tailrace	Yearling Chinook	Average	0.456	0.443	0.422	0.410	0.029	0.00000	0.000%
ED10	Rock Is. Tailrace	Yearling Chinook	High	0.461	0.476	0.418	0.432	0.153	0.00000	0.000%
ED10	Rock Is. Tailrace	Yearling Chinook	Low	0.265	0.350	0.148	0.195	0.261	0.00000	0.000%
ED10	Snake R. Trap	Steelhead	Average	0.343	0.657	0.251	0.480	0.005	0.00000	0.000%
ED10	Snake R. Trap	Steelhead	High	0.456	0.775	0.363	0.615	0.734	0.00000	0.000%
ED10	Snake R. Trap	Steelhead	Low	0.065	0.602	0.039	0.364	0.632	0.00000	0.000%
ED10	Snake R. Trap	Subyearling Chinook	Average	0.142	0.433	0.092	0.282	0.483	0.00002	0.005%
ED10	Snake R. Trap	Subyearling Chinook	High	0.150	0.421	0.105	0.294	0.467	0.00000	0.000%
ED10	Snake R. Trap	Subyearling Chinook	Low	0.140	0.457	0.081	0.265	0.522	0.00002	0.004%
ED10	Snake R. Trap	Yearling Chinook	Average	0.381	0.661	0.273	0.473	0.567	0.00000	0.000%
ED10	Snake R. Trap	Yearling Chinook	High	0.443	0.688	0.341	0.530	0.553	0.00000	0.000%
ED10	Snake R. Trap	Yearling Chinook	Low	0.348	0.635	0.264	0.633	0.667	0.00000	0.000%
LD10	Hanford Reach	Fall Chinook	Average	0.409	0.500	0.310	0.380	0.217	0.00000	0.000%
LD10	Hanford Reach	Fall Chinook	High	0.427	0.516	0.326	0.394	0.222	0.00001	0.002%
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LD10	Rock Is. Tailrace	Yearling Chinook	High	0.461	0.476	0.418	0.432	0.153	0.00000	0.000%
LD10	Rock Is. Tailrace	Yearling Chinook	Low	0.265	0.350	0.148	0.195	0.261	0.00000	0.000%

Table 3. Smolt Survivals in Scenarios and Change from Base Case UD5 (continued)

Scenario	Rel. Site	Stock	Flow	Survival thru BON		Survival thru Estuary		transport fraction	Survival Change from base	
				In-river	Total System	In-river	Total System		Absolute	Percent
LD10	Snake R. Trap	Steelhead	Average	0.343	0.657	0.251	0.480	0.605	0.00000	0.000%
LD10	Snake R. Trap	Steelhead	High	0.456	0.775	0.363	0.615	0.734	0.00000	0.000%
LD10	Snake R. Trap	Steelhead	Low	0.065	0.602	0.039	0.364	0.632	0.00000	0.000%
LD10	Snake R. Trap	Subyearling Chinook	Average	0.142	0.433	0.092	0.282	0.483	0.00001	0.002%
LD10	Snake R. Trap	Subyearling Chinook	High	0.150	0.421	0.105	0.294	0.457	0.00000	0.000%
LD10	Snake R. Trap	Subyearling Chinook	Low	0.140	0.457	0.081	0.265	0.522	0.00000	0.000%
LD10	Snake R. Trap	Yearling Chinook	Average	0.381	0.661	0.273	0.473	0.567	0.00000	0.000%
LD10	Snake R. Trap	Yearling Chinook	High	0.443	0.688	0.341	0.530	0.553	0.00000	0.000%
LD10	Snake R. Trap	Yearling Chinook	Low	0.348	0.635	0.264	0.633	0.867	0.00000	0.000%
LW	Hanford Reach	Fall Chinook	Average	0.409	0.500	0.310	0.380	0.217	-0.00001	-0.002%
LW	Hanford Reach	Fall Chinook	High	0.427	0.515	0.326	0.394	0.222	-0.00001	-0.002%
LW	Hanford Reach	Fall Chinook	Low	0.395	0.566	0.288	0.412	0.370	0.00001	0.002%
LW	Rock Is. Tailrace	Steelhead	Average	0.546	0.511	0.482	0.452	0.036	0.00000	0.000%
LW	Rock Is. Tailrace	Steelhead	High	0.566	0.553	0.513	0.499	0.091	0.00000	0.000%
LW	Rock Is. Tailrace	Steelhead	Low	0.219	0.289	0.112	0.147	0.237	0.00000	0.000%
LW	Rock Is. Tailrace	Yearling Chinook	Average	0.456	0.443	0.422	0.410	0.029	0.00000	0.000%
LW	Rock Is. Tailrace	Yearling Chinook	High	0.461	0.476	0.418	0.432	0.153	0.00000	0.000%
LW	Rock Is. Tailrace	Yearling Chinook	Low	0.265	0.350	0.148	0.195	0.261	0.00000	0.000%
LW	Snake R. Trap	Steelhead	Average	0.343	0.657	0.251	0.480	0.605	0.00000	0.000%
LW	Snake R. Trap	Steelhead	High	0.456	0.775	0.363	0.615	0.734	0.00000	0.000%
LW	Snake R. Trap	Steelhead	Low	0.065	0.602	0.039	0.364	0.632	0.00000	0.000%
LW	Snake R. Trap	Subyearling Chinook	Average	0.142	0.433	0.092	0.282	0.483	0.00000	0.000%
LW	Snake R. Trap	Subyearling Chinook	High	0.149	0.421	0.104	0.294	0.457	-0.00001	-0.002%
LW	Snake R. Trap	Subyearling Chinook	Low	0.140	0.457	0.081	0.265	0.522	0.00000	0.000%
LW	Snake R. Trap	Yearling Chinook	Average	0.381	0.661	0.273	0.473	0.567	0.00000	0.000%
LW	Snake R. Trap	Yearling Chinook	High	0.443	0.688	0.341	0.530	0.553	0.00000	0.000%

Table 3. Smolt Survivals in Scenarios and Change from Base Case UD5 (continued)

Scenario	Ref_Site	Stock	Flow	Survival thru BON		Survival thru Estuary		transport fraction	Survival Change from base	
				In-river	Total System	In-river	Total System		Absolute	Percent
LW	Snake R. Trap	Yearling Chinook	Low	0.348	0.835	0.264	0.633	0.867	0.00000	0.000%
UD10	Hanford Reach	Fall Chinook	Average	0.409	0.500	0.310	0.380	0.217	0.00002	0.004%
UD10	Hanford Reach	Fall Chinook	High	0.427	0.516	0.326	0.394	0.222	0.00000	0.000%
UD10	Hanford Reach	Fall Chinook	Low	0.395	0.566	0.288	0.412	0.370	0.00001	0.002%
UD10	Rock Is. Tailrace	Steelhead	Average	0.546	0.511	0.482	0.452	0.036	0.00000	0.000%
UD10	Rock Is. Tailrace	Steelhead	High	0.568	0.553	0.513	0.499	0.091	0.00000	0.000%
UD10	Rock Is. Tailrace	Steelhead	Low	0.219	0.289	0.112	0.147	0.237	0.00000	0.000%
UD10	Rock Is. Tailrace	Yearling Chinook	Average	0.456	0.443	0.422	0.410	0.029	0.00000	0.000%
UD10	Rock Is. Tailrace	Yearling Chinook	High	0.461	0.476	0.418	0.432	0.153	0.00000	0.000%
UD10	Rock Is. Tailrace	Yearling Chinook	Low	0.265	0.350	0.148	0.195	0.261	0.00000	0.000%
UD10	Snake R. Trap	Steelhead	Average	0.343	0.657	0.251	0.480	0.605	0.00000	0.000%
UD10	Snake R. Trap	Steelhead	High	0.456	0.775	0.363	0.615	0.734	0.00000	0.000%
UD10	Snake R. Trap	Steelhead	Low	0.065	0.602	0.039	0.364	0.632	0.00000	0.000%
UD10	Snake R. Trap	Subyearling Chinook	Average	0.142	0.433	0.092	0.282	0.483	0.00001	0.002%
UD10	Snake R. Trap	Subyearling Chinook	High	0.150	0.421	0.105	0.294	0.457	0.00000	0.000%
UD10	Snake R. Trap	Subyearling Chinook	Low	0.140	0.457	0.081	0.285	0.522	0.00001	0.002%
UD10	Snake R. Trap	Yearling Chinook	Average	0.361	0.661	0.273	0.473	0.567	0.00000	0.000%
UD10	Snake R. Trap	Yearling Chinook	High	0.443	0.688	0.341	0.530	0.553	0.00000	0.000%
UD10	Snake R. Trap	Yearling Chinook	Low	0.348	0.835	0.264	0.633	0.867	0.00000	0.000%

Table 4. Fish Travel Time Between McNary and Bonneville Dams and Deviation from Base Case UD5

Scenario	Release site	Stock	Flow	MCN-Bon TT (d)	Change in TT (d) from UD5
ED10	Hanford Reach	Fall Chinook	Average	18.08	0.00000
ED10	Hanford Reach	Fall Chinook	High	17.43	0.00000
ED10	Hanford Reach	Fall Chinook	Low	19.75	0.00000
ED10	Rock Is. Tailrace	Steelhead	Average	7.44	0.00000
ED10	Rock Is. Tailrace	Steelhead	High	3.9	0.00000
ED10	Rock Is. Tailrace	Steelhead	Low	15.07	0.00000
ED10	Rock Is. Tailrace	Yearling Chinook	Average	8.54	0.01000
ED10	Rock Is. Tailrace	Yearling Chinook	High	9.32	0.00000
ED10	Rock Is. Tailrace	Yearling Chinook	Low	14.12	0.00000
ED10	Snake R. Trap	Steelhead	Average	11.31	0.00000
ED10	Snake R. Trap	Steelhead	High	6.01	0.00000
ED10	Snake R. Trap	Steelhead	Low	11.91	0.00000
ED10	Snake R. Trap	Subyearling Chinook	Average	7.25	-0.01000
ED10	Snake R. Trap	Subyearling Chinook	High	6.29	-0.01000
ED10	Snake R. Trap	Subyearling Chinook	Low	8.92	-0.05000
ED10	Snake R. Trap	Yearling Chinook	Average	10.24	0.00000
ED10	Snake R. Trap	Yearling Chinook	High	8.44	0.00000
ED10	Snake R. Trap	Yearling Chinook	Low	9.34	0.00000
LD10	Hanford Reach	Fall Chinook	Average	18.08	0.00000
LD10	Hanford Reach	Fall Chinook	High	17.43	0.00000
LD10	Hanford Reach	Fall Chinook	Low	19.75	0.00000
LD10	Rock Is. Tailrace	Steelhead	Average	7.44	0.00000
LD10	Rock Is. Tailrace	Steelhead	High	3.9	0.00000
LD10	Rock Is. Tailrace	Steelhead	Low	15.07	0.00000
LD10	Rock Is. Tailrace	Yearling Chinook	Average	8.53	0.00000
LD10	Rock Is. Tailrace	Yearling Chinook	High	9.32	0.00000
LD10	Rock Is. Tailrace	Yearling Chinook	Low	14.12	0.00000
LD10	Snake R. Trap	Steelhead	Average	11.31	0.00000
LD10	Snake R. Trap	Steelhead	High	6.01	0.00000
LD10	Snake R. Trap	Steelhead	Low	11.85	0.00000
LD10	Snake R. Trap	Subyearling Chinook	Average	7.27	0.01000
LD10	Snake R. Trap	Subyearling Chinook	High	6.3	0.00000
LD10	Snake R. Trap	Subyearling Chinook	Low	8.96	0.01000
LD10	Snake R. Trap	Yearling Chinook	Average	10.24	0.00000
LD10	Snake R. Trap	Yearling Chinook	High	8.44	0.00000
LD10	Snake R. Trap	Yearling Chinook	Low	9.34	0.00000
LW	Hanford Reach	Fall Chinook	Average	18.08	0.00000
LW	Hanford Reach	Fall Chinook	High	17.43	0.00000
LW	Hanford Reach	Fall Chinook	Low	19.75	0.00000
LW	Rock Is. Tailrace	Steelhead	Average	7.44	0.00000
LW	Rock Is. Tailrace	Steelhead	High	3.9	0.00000
LW	Rock Is. Tailrace	Steelhead	Low	15.07	0.00000
LW	Rock Is. Tailrace	Yearling Chinook	Average	8.53	0.00000
LW	Rock Is. Tailrace	Yearling Chinook	High	9.32	0.00000
LW	Rock Is. Tailrace	Yearling Chinook	Low	14.12	0.00000
LW	Snake R. Trap	Steelhead	Average	11.31	0.00000
LW	Snake R. Trap	Steelhead	High	6.01	0.00000
LW	Snake R. Trap	Steelhead	Low	11.83	-0.02000

Table 4. Fish Travel Time Between McNary and Bonneville Dams and Deviation from Base Case UD5 (continued)

Scenario	Release site	Stock	Flow	MCN-Bon TT (d)	Change in TT (d) from UD5
LW	Snake R. Trap	Subyearling Chinook	Average	7.26	0.00000
LW	Snake R. Trap	Subyearling Chinook	High	6.29	-0.01000
LW	Snake R. Trap	Subyearling Chinook	Low	8.96	0.01000
LW	Snake R. Trap	Yearling Chinook	Average	10.24	0.00000
LW	Snake R. Trap	Yearling Chinook	High	8.44	0.00000
LW	Snake R. Trap	Yearling Chinook	Low	9.34	0.00000
UD10	Hanford Reach	Fall Chinook	Average	18.08	0.00000
UD10	Hanford Reach	Fall Chinook	High	17.43	0.00000
UD10	Hanford Reach	Fall Chinook	Low	19.75	0.00000
UD10	Rock Is. Tailrace	Steelhead	Average	7.44	0.00000
UD10	Rock Is. Tailrace	Steelhead	High	3.9	0.00000
UD10	Rock Is. Tailrace	Steelhead	Low	15.07	0.00000
UD10	Rock Is. Tailrace	Yearling Chinook	Average	8.53	0.00000
UD10	Rock Is. Tailrace	Yearling Chinook	High	9.32	0.00000
UD10	Rock Is. Tailrace	Yearling Chinook	Low	14.12	0.00000
UD10	Snake R. Trap	Steelhead	Average	11.31	0.00000
UD10	Snake R. Trap	Steelhead	High	6.01	0.00000
UD10	Snake R. Trap	Steelhead	Low	11.88	0.03000
UD10	Snake R. Trap	Subyearling Chinook	Average	7.26	0.00000
UD10	Snake R. Trap	Subyearling Chinook	High	6.29	-0.01000
UD10	Snake R. Trap	Subyearling Chinook	Low	8.96	-0.01000
UD10	Snake R. Trap	Yearling Chinook	Average	10.24	0.00000
UD10	Snake R. Trap	Yearling Chinook	High	8.44	0.00000
UD10	Snake R. Trap	Yearling Chinook	Low	9.34	0.00000

Table 5. In-river Survivals of Snake River Fall Chinook Salmon from the Head of McNary Pool through Bonneville Dam

		UD5	UD10	LW	ED10	LD10
1960	Survival	0.56362	0.56393	0.56327	0.56440	0.56421
	Δ from base		0.055%	-0.062%	0.138%	0.105%
1974	Survival	0.58662	0.58671	0.58628	0.58657	0.58665
	Δ from base		0.015%	-0.058%	-0.009%	0.005%
1977	Survival	0.53037	0.53076	0.53001	0.53169	0.53010
	Δ from base		0.073%	-0.069%	0.247%	-0.051%

Table 6. Snake River Fall Chinook Salmon In-river Survivals from the Head of the Bonneville Pool through Bonneville Dam as a Surrogate for the Listed Lower Columbia Chinook Stock

		UD5	UD10	LW	ED10	LD10
1960	Survival	0.82940	0.82970	0.82889	0.83045	0.82998
	Δ from base		0.036%	-0.062%	0.127%	0.069%
1974	Survival	0.84597	0.84599	0.84565	0.84584	0.84599
	Δ from base		0.002%	-0.038%	-0.016%	0.002%
1977	Survival	0.82992	0.83033	0.82941	0.83158	0.82945
	Δ from base		0.049%	-0.061%	0.200%	-0.057%

Table 7. Water Velocity between McNary Pool and Bonneville Dam for the Five Scenarios

		Velocities in ft/s				
Location		ED10	LD10	LW	UD10	UD5
Average Flow	Estuary	0.513	0.514	0.500	0.514	0.507
	Jones_Beach	1.418	1.421	1.384	1.420	1.402
	Columbia_Gorge	0.843	0.845	0.823	0.844	0.834
	Bonneville_Tailrace	1.371	1.374	1.338	1.373	1.356
	Bonneville_Pool	1.424	1.428	1.390	1.426	1.408
	The_Dalles_Pool	0.986	0.989	0.962	0.988	0.975
	John_Day_Pool	0.480	0.482	0.468	0.481	0.475
	Deschutes_Confluence	1.244	1.247	1.213	1.246	1.230
	McNary_Pool	0.695	0.696	0.677	0.696	0.686
	Average Velocity	0.997	0.999	0.973	0.999	0.986
	Δ from base (UD5)	0.011	0.014	-0.013	0.013	
High Flow	Estuary	0.662	0.663	0.649	0.663	0.656
	Jones_Beach	1.830	1.833	1.796	1.832	1.814
	Columbia_Gorge	1.088	1.090	1.068	1.089	1.079
	Bonneville_Tailrace	1.770	1.773	1.737	1.772	1.755
	Bonneville_Pool	1.826	1.829	1.791	1.828	1.810
	The_Dalles_Pool	1.254	1.257	1.230	1.256	1.243
	John_Day_Pool	0.619	0.620	0.607	0.619	0.613
	Deschutes_Confluence	1.588	1.591	1.556	1.590	1.573
	McNary_Pool	0.869	0.871	0.851	0.870	0.861
	Average Velocity	1.278	1.281	1.254	1.280	1.267
	Δ from base (UD5)	0.011	0.013	-0.013	0.013	
Low Flow	Estuary	0.391	0.392	0.378	0.392	0.385
	Jones_Beach	1.080	1.084	1.046	1.082	1.065
	Columbia_Gorge	0.642	0.644	0.622	0.644	0.633
	Bonneville_Tailrace	1.045	1.048	1.012	1.047	1.030
	Bonneville_Pool	1.065	1.068	1.030	1.067	1.049
	The_Dalles_Pool	0.722	0.725	0.698	0.724	0.711
	John_Day_Pool	0.358	0.359	0.346	0.359	0.353
	Deschutes_Confluence	0.906	0.908	0.874	0.907	0.891
	McNary_Pool	0.552	0.554	0.534	0.553	0.544
	Average Velocity	0.751	0.753	0.727	0.753	0.740
	Δ from base (UD5)	0.011	0.014	-0.013	0.013	

**ATTACHMENT B
USGS COLUMBIA RIVER
MEASUREMENTS NEAR THE DALLES**

FEISWP-273710459.d06

Surface water measurements
 # Further descriptions of the columns and codes used can be found at:
 # http://waterdata.usgs.gov/nwis/dv/output_format.php#streamflow_measurement_data
 # Stations in this file include:
 # USGS 14105700 COLUMBIA RIVER AT THE DALLES, OR

site_no	agency_cd	measurement		party_nm	channel_width_va	cross_area_va	velocity_va	inside_gage_va	outside_gage_va	discharge_ft	measured_rating_dif	section_va	gage_va_change	gage_va_base	measurement_type_cd	control_type_cd
		no	dt													
15a	5a	5a	10a	12a	12a	12a	12a	12a	12a	12a	12a	2a	6a	6a	12a	12a
14105700	USGS	350	8/11/85	STA/FF	1140	18700	2.65	75.48		264000	G	24	0.2	1.2	BOAT	
14105700	USGS	351	10/23/85 7:45	JEP/KOL	1140	82800	1.87	74.74		155000	G	20		0	BOAT	
14105700	USGS	352	10/23/85 8:25	JEP/KOL	1120	92800	1.64	73.75		154000	G	22		0	BOAT	
14105700	USGS	353	10/27/85 15:05	KUL/DCC	1140	98100	1.85	75.62		161000	G	23	0.52	1.2	BOAT	
14105700	USGS	354	5/21/86 10:20	KAK/TAH	1160	100000	2.74	75.29	75.2	269000	G	25	0.05	1	BOAT	
14105700	USGS	355	7/3/87 10:45	JEP/TAH	1140	94800	2.05	77.3	77.5	286000	G	25	0.3	0.8	BOAT	
14105700	USGS	356	7/3/87 11:30	JEP/TAH	1170	98200	2.54	77.57	77.57	279000	G	25	14.15	0.7	BOAT	
14105700	USGS	357	7/9/87 10:40	TAH/GWY	1150	85700	1.22	75.17	75.17	117000	G	21	6.15	1	BOAT	
14105700	USGS	358	7/9/87 11:40	TAH/GWY	1150	98700	1.16	75.17	75.17	112000	F	20	0.88	1	BOAT	
14105700	USGS	359	2/22/88 12:47	TAH/MAJ			1.9	75.45		179000	G			0	BOAT	
14105700	USGS	360	5/8/89 15:05	TAH/ST			3.2	79.3		318000	F			0	BOAT	
14105700	USGS	361	6/23/89 13:15	KAL/MAJ			1.22	75.22		116000	F			0	BOAT	
14105700	USGS	362	8/20/89 14:06	CKR/TAH			0	76.00		131000	G			0	BOAT	
14105700	USGS	363	12/10/89 11:20	KUL/BUF			0	75.73		90800	G			0		
14105700	USGS	364	4/13/89 11:23	KUL/OP			0	74.56		152000	G			0	BOAT	
14105700	USGS	365	5/7/89 11:47	KUL/DCT			0	77.18		217000	G			0	BOAT	
14105700	USGS	366	10/12/89 9:18	RLK/REW			0	76.81		132000	G			0	BOAT	
14105700	USGS	367	3/6/88 11:55	REW/RLK			0	77.05		212000	G			0	BOAT	
14105700	USGS	368	5/23/85 11:34	RLK/REW			0	75.49		285000	G			0	BOAT	
14105700	USGS	369	11/22/85 10:30	RLK/REW			0	75.59		207000	G			0	BOAT	
14105700	USGS	370	5/22/87 10:00	REW/TKE			0	85.14		510000	G		0.14	0.4	BOAT	CLEAR
14105700	USGS	371	8/27/87 14:20	REW/RLK			0	81.3		363000	G		0.01	0.5	BOAT	CLEAR
14105700	USGS	372	1/21/88 10:59	RLK/REW			0	76.88		218000	G		0.23	0.8	BOAT	CLEAR
14105700	USGS	373	4/24/88 11:45	REW/RLK			0	77.97		228000	G		0.56	0.5	BOAT	
14105700	USGS	374	7/22/88 14:28	REW/MAJ			0	77.71		211000	G		0.07	0.1		
14105700	USGS	375	11/25/88 11:03	REW/RLK			0	76.04		138000	G		0.09	0.0	BOAT	CLEAR
14105700	USGS	376	5/18/89 12:44	RLK/REW			0	77.85		220000	F		0.35	0.8	BOAT	
14105700	USGS	377	10/25/89 13:20	REW/RLK		35800	0	76.71		112000	G		0.25	1.3	BOAT	CLEAR
14105700	USGS	378	4/20/89 10:55	REW/RLK		160000	0	82		303000	G			0	BOAT	
14105700	USGS	379	8/15/89	RLK/REW		99000	0	75.28		254000	G			0		
14105700	USGS	380	8/21/89	RLW/GWY		94500	1.47	75.7		139000	G		0.03	0.7		
14105700	USGS	381	3/8/89 11:11	GWY/REW		97500	1.3	74.82		140000	G		0.08	0.9	BOAT	
14105700	USGS	382	9/26/89 12:13	RLK/REW		95700	1.30	76.81		130000	G		0.13	0.9	BOAT	
14105700	USGS	383	2/6/82 11:57	GWY/REW	1100		0	74.66		150000	F			0	BOAT	
14105700	USGS	385	1/24/82 16:07	GWY/RLK	1110		0	73.71		214000	G			0	BOAT	CLEAR
14105700	USGS	386	12/20/82 18:10	GWY/RLK	1110	101000	1.08	75.56		104000	F		0.06	0.6	BOAT	
14105700	USGS	387	12/20/82 18:29	GWY/RLK	1110	101000	1.03	75.52		104000	F		0.08	0.6	BOAT	



IN REPLY REFER TO:
EPH-2000
FIN-1.10

United States Department of the Interior

BUREAU OF RECLAMATION

Ephrata Field Office
P. O. Box 815
Ephrata, Washington 98823

E.C.B.I.D.
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MAR 28 2000

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Mr. Richard Erickson
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Mr. Shannon McDaniel
Secretary-Manager
South Columbia Basin Irrigation District
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Subject: 2000-04 Diversion Rate (DR) Columbia Basin Project

Gentlemen:

We are in receipt of the East, Quincy, and South Columbia Basin Irrigations District's (Districts) joint-letter of March 9, 2000, in which the Districts accepted the draft narrative and proposed DR for Calendar Year (CY) 2000-04 as outlined in our January 13, 2000 letter.

The DR for the CY 2000-04 has been set at \$1.0676 per acre-foot and is in accordance with your March 9 letter. We have enclosed a final copy of the narrative, Columbia Basin Diversion Rate 2000-2004, dated January 11, 2000, which outlines the methodology used to develop the rate and the spread sheet, Diversion Rate: CY 2000 through 2004, dated December 17, 1999, which provides a breakdown of the rate calculation. Both documents are consistent with the drafts provided in our January 13 letter.

As stated in your letter, we are in agreement that the CY 2000-04 DR is set without prejudice to the respective positions of Reclamation and the Districts regarding the allocation and inclusion of replacement costs in future diversion rates.

Sincerely,

William D. Gray
Deputy Area Manager

Enclosures

Enclosure (2)

January 11, 2000

Columbia Basin Diversion Rate

2000-2004

The methodology associated with setting the Columbia Basin Diversion Rate relies on the Theory of Ultimate Development (TUD). TUD distributes costs based on development levels at the time of the rate setting. This diversion rate setting shall continue to use the TUD process with an adjustment for equipment operating conditions. Under the TUD process, the ultimate development of the basin is projected to be a diversion of 21,847,000 acre-feet over a five-year rate period, of which, 19,710,000 acre-feet (3,942,000 per year) is identified with irrigation and 2,137,000 acre-feet (427,400 per year) is identified with pump/back generation. Pump/back generation is the operation of the pump/generator (p/g) plant for power purposes.

Under the TUD methodology, the distribution of costs is in proportion to the development level of the project. In the current case, irrigation diversions for the 2000-2004 year period are projected to be 2,500,000 acre-feet per year or 12,500,000 acre-feet over the five-year rate period. The projected diversion of 12,500,000 acre-feet is 57.22% of the ultimate diversion. Under the TUD methodology, this 57.22 % is applied as irrigation costs of operation and maintenance of the p/g plant. The remaining percentage would be paid by power.

The establishment of 427,400 acre-feet per year as the pump/back generation development level is based on use of the plant, three months out of the year, typically during winter high-power demand periods. Planned pumping occurs for eight hours per day with generation also occurring eight hours per day during weekday periods. Assuming a pumping rate of 1,795 cfs for a p/g unit, 6 units pumping eight hours a day will pump 7,123 acre-feet per day. For a three month period (20 weekdays per month or 60 pumping days) the total pumped is 427,400 acre-feet.

The amount of water used for pump/back generation contributes to the ultimate development level of 21,847,000 acre-feet, but does not affect the irrigation diversion rate setting except to establish a basis for cost of storage and transmission services. In these cases, the cost is distributed on a "prorata" basis in proportion to the number of acre-feet diverted.

Discussion:

Only in the past four years has the pump/back generation feature of the plant been used to any great extent. For a number of years in the 1980's and early 1990's, pg-7, and pg-8 were in a "decommissioned" status due to design deficiencies, maintenance problems and the lack of plant operation in the pump/back mode. P/g-7 and p/g-8 were put back into service in 1996. Since 1996, the plant has been used extensively to help meet the requirements and flexibility demanded of the power system. Pumping for irrigation purposes now takes place during light load hours and weekends. Light load hours are generally from about 10:00 p.m. to about 6:00 a.m. on week

days, and during all weekend hours. During heavy irrigation periods, all available pump and p/g units may be started at 10:00 p.m. and pumping normally continues until around 6:00 a.m. when shutdown occurs. When the irrigation demand lessens, fewer pump and p/g units are used. When daily power demands are such that generation is necessary from the p/g plant, the p/g units may be started at midnight for pumping and shutdown in the morning, restarted in the generation mode during the morning peak then shut down, restarted for the evening peak and shut down again before starting the cycle over the next day. Weekends typically call for pump and p/g units to be started and run throughout the weekend and then shutdown Monday morning at about 6:00 a.m.

Operation in the above manner allows for significant flexibility in operation of the power system. During high pumping periods, pumping power loads can be as much as 600 megawatts. Shutdown and reversal of the p/g units allows generation of as much as 300 megawatts. The flexibility to "adjust" the power system load by up to 900 megawatts (-600 to + 300) provides significant operational flexibility. Operation of the p/g plant in the generation mode also allows for power sales during "heavy load" conditions and maximizes revenue opportunities.

Deregulation of the power industry has contributed greatly to the current plant operating conditions. Load shaping through pump timing, power generation through use of the p/g units, and use of the p/g units to meet spinning reserve requirements have all become important considerations. These considerations have manifested themselves largely due to deregulation of the power industry and the sales and marketing opportunities it has created.

Not all of this has happened without cost. The substantial increase in starting and stopping of the pump and p/g units has taken its toll on the equipment. Unit circuit breaker operations have risen by a factor of over eight. In the period from 1990 to 1994, the average annual number of circuit breaker operations was 178, with a high of 267 and a low of 143. The average number of breaker operations for the period of 1996 to 1999 was 1,485 with a high of 1,893 and a low of 1,139. The year 1996 was omitted, because it is considered a transition year between past and current operations. This increase in the starting and stopping of units has also increased operation and maintenance requirements. Costs associated with the plant maintenance have nearly doubled in the past three years. Plant equipment, particularly circuit breakers, have required overhaul and refurbishment on an increased basis. Much of the equipment is nearly 50 years old, and parts are difficult to obtain. The increased service conditions have accelerated maintenance requirements and shortened the remaining useful life of the equipment accordingly.

The TUD principle, when used to figure cost distribution for the Columbia Basin, is premised on a distribution of benefits as compared to ultimate development. This works well in a project where capacity was built and unutilized. It worked well for the pumping plant when the primary purpose in its use was irrigation pumping. However, with the dramatic increase in use of the plant due to power deregulation and the corresponding increase in maintenance costs, without refinement, use of TUD may now be distributing a disproportionate share of the plant maintenance costs to irrigation interests.

The reliability of pump and p/g units is critical to both irrigation and power interests; however, different degrees of reliability are required to serve the needs of both. Irrigation interests can normally be met with seven pump or p/g units. Power interests are met best when all units are available as maximum load shaping and generation ability is then available. This apparent conflict and the costs associated with ensuring those different levels of reliability require TUD to be modified when costs of pump and pump generating equipment O&M are considered. On the one hand, irrigation interests are paying for the majority of the costs for O&M (57%); while on the other hand, power operations are subjecting the units to increased operating requirements and much harsher maintenance conditions.

Adjustment for Power Operating Conditions:

Since the operation and maintenance conditions of the p/g plant does not affect storage or transmission costs, those costs continue to be calculated using TUD methods. In addition, the costs of the p/g plant structure and associated equipment such as sump pump, elevators, lighting, janitorial, etc., are unaffected by the service conditions of the pumps and p/g's. Therefore, the irrigation share of these items shall continue to be determined using the TUD methodology.

However, a straight application of TUD does not provide an equitable distribution of operation and maintenance costs when applied to pumps, pump generators and associated equipment. Under TUD, the cause of significantly increased maintenance costs and loss of equipment service life, namely power operations, would continue to pay a minor share (43%) of the cost.

An adjustment to the cost distribution for equipment replacement, and extraordinary maintenance (RAX) items on pumps and p/g's, transformers, other associated equipment and the daily maintenance cost associated with the pump and p/g units and equipment is in order to account for the increases caused by the "deregulated" operational conditions. For purposes of this rate setting, the following process was used to establish a distribution rate to be applied to "deregulated" equipment. A new distribution factor is based on comparison of the adjusted estimated daily O&M costs of the previous rate period to the increased estimated costs for the current rate period. It is assumed that the estimate for daily O&M for the last rate period was reasonably accurate, if the effects of power deregulation had not raised costs. It is also assumed, that daily O&M costs would have risen at approximately the same rate as inflation, if the plant had continued to operate under historic conditions without power deregulation.

The estimate for basic routine maintenance for the previous five-year rate period was \$4,500,000. This amount is then considered the cost "baseline." This amount is escalated by inflation (consumer price index factor of 1.12117 since September of 1994, approximately 2.3%) and becomes \$5,045,265. This would be the "baseline" amount for the new rate period. Application of the TUD percentage of 57.22% would result in an irrigation share of \$2,886,704 ($\$5,045,265 \times .5722$). Under the assumption that increases beyond this amount are attributable to the effects of deregulation and power operations, the remaining cost should be borne by power. The

"calculated" irrigation share of \$2,886,704 is 36.10% of the new rate period estimate of \$7,996,000. This 36.10% is then applied to expenses associated with the maintenance of equipment such as pumps and pump/generators.

Operations costs should also be subject to the 36.10% irrigation share. The increased number of operations of plant units requires a corresponding increase in the attendance of operations staff in the pumping plant. Operations costs are increased due to power operations requirements; therefore, it is appropriate that these additional costs be borne by the power interest.

Since facility maintenance costs, other than those associated with pump and p/g units and associated equipment, are not effected by increased service factors, costs for these items should continue to be paid by applying the TUD process resulting in an irrigation assessment of 57.22%.

660.

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JUL 15 1983

Memorandum

To: Regional Director, Boise, Idaho
Attention: PH 770

From: Project Manager, Grand Coulee, Washington

Subject: Proposed Operating Plan for Banks Lake and Grand Coulee
Pumping/Generating Plant

Several Project personnel have been in discussion with both Regional office staff and Columbia Basin Project personnel related to future operations with implementation of pumped storage. We felt that it would be advantageous to draft an Operating Plan for your use which could also be used as a reference in future power and water discussions; e.g., NWPP-DC meetings.

The enclosed Operating Plan also serves to document several telephone conversations between your staff and Grand Coulee Operations.

R.E. Etheridge

Enclosure

cc: Regional Director, Boise, Idaho
Attn: PH 240, PH 400, PH 460 (all w/encl.)

Project Manager, Columbia Basin Project, Ephrata, Washington
Attn: CBP 400, CBP 430, CBP 470 (all w/encl.)

bcc: Files, Chron. 100, 140, 150, 320, 400, 600, 620, 630, 1000
(all w/encl. except Chron)

JA Pederson:lfn:06-30-83

Enclosure (3)

BANKS LAKE
and
GRAND COULEE PUMPING/GENERATING PLANT
OPERATING PLAN

INTRODUCTION

As we gradually convert from a pure irrigation pumping plant to a two-season pumped storage and pumping plant, careful consideration should be given to a new operating plan. The planned maintenance program will undergo major change since: (a) 12 units will require maintenance instead of 6 and (b) units will be in daily operation every month except March and November. The inspection and attendance by Operations personnel will be intensified due to load factoring in the summer months and the many unit starts during the winter peaking period for both modes of operation.

We can expect a strong "learning curve" for the first couple of years before we settle into a smooth "modus operandi" and firm Maintenance schedule.

SUMMER PUMPING PLAN

Background (Historical). In 1983 a total of 520,000 acres are under irrigation by waters delivered to Banks Lake by the P/G Plant. Over the last 7 years an average of 2,200,000 acre-feet of water has been delivered for irrigation purposes. The pump operation may start anywhere from March 26 to May 4 and typically the last pump is shutdown on October 20--22. The total energy consumed by the pump motors (including P/G-7-8) on an annual basis has varied from a minimum of 485,733,000 kWh to a maximum 997,607,000 kWh over the period 1975--1982. (See Attachment No. 1) Normal operating range of Banks Lake during the summer varies between elevation 1568.0 and elevation 1570 which is full pool. The maximum water delivery through the main canal to date was 9700 cfs on June 22, 1982. The total water pumped exceeds the South Dam withdrawals by about 4% primarily due to evaporation. (See Attachment No. 2) An unusual operating level occurred during the winter of 1980--81 to provide a maximum drawdown for: (a) freezing roots of the Eurasian Watermilfoil and (b) cofferdam work associated with the Grand Coulee Feeder Canal expansion contract. For this purpose, the lake was lowered to El. 1545.13 (10/31/80) and remained there until February 12 to freeze the roots of the milfoil.

Future. With the expansion of the Columbia Basin Project irrigated lands, additional water deliveries will be required each year until a maximum of over 1,000,000 acres is realized. The present water delivery profile will be valid with a factor applied directly to acreage additions; i.e., the starting and stopping pump dates will never change dramatically. If a major crop change occurred (similar to the demise of the sugar beet), some shifting of delivery times may occur but overall volume of water required should be fairly predictable.

The South Dam outlet works has a minimum delivery capacity of 10,400 cfs with a Banks Lake elevation of 1537 and a maximum capacity of 19,000+ cfs at El. 1570. With the second Bacon Siphon tunnel in service the Main Canal is rated at 19,300 cfs. Water deliveries are expected to peak in the future at 19,000 cfs for a projected irrigated land development of 1,095,000 acres.

A minimum of 10 units will be in service in the P/G Plant to meet this demand and maintain an acceptable water surface elevation during parts of June, July, and August. Maximum power demands will be approximately 470 MW during the June, July period at the full development level.

P-1---6 Limitations. The pump units P-1---6 may be operated at any FDR Lake elevation above 1208.00. There are certain gross head combinations of the G-1-2-3 turbines and P-1---6 pumps which preclude attaining synchronous speed during a two-pump start. This can be determined by overlaying a pump requirement curve (MW vs. gross head) on a generator output curve (MW vs. gross turbine/load) and determining the net difference in MW. A one-pump start is always possible at FDR elevation above 1208.00 regardless of the elevation of Banks Lake.

There are several major reasons to minimize pumping at higher pump heads. The major consideration is to attain the maximum volume of water pumped for a given amount of energy consumed. For this reason, it is desirable for FDR to be $\geq$ E1. 1240 when the pumping requirement climbs to a first peak of 6000 cfs on May 10--20 each year.

<u>Gross Head</u>	<u>CFS Pumped</u>
362 (1570-1208)	967
328 (1568-1240)	1363
280 (1570-1290)	1605

P/G-7-8 Limitations. The Pump/Generators P/G-7-8 are not to be operated at heads greater than 317' except in an emergency. Normal operation (by choice) will not exceed a gross head of 306'. This gross head should include a contingency of the siphon breaker opening inadvertently which approximates an upper pool elevation of 1580. With these considerations, pumping should occur when FDR Lake is $\geq$ 1263 elevation (1580 minus 317).

<u>Gross Head</u>	<u>CFS Pumped</u>
317	1645
307	1735
280	1948

P/G-9---12 Limitations. These units appear satisfactory for operation at a pumping head up to 339' which was performed during a test of P/G-9 on April 12, 1983. Again considering the possibility of the siphon breaker opening, pumping should occur at FDR elevations $\geq$ 1241 feet (1580 minus 339).

<u>Gross Head</u>	<u>CFS Pumped</u>
340	1372
330	1440
300	1742
280	1912

Overall Recommendations. Taking into considerations the above water requirements and technical limitations plus recreation and fish and wildlife concerns the following plan is proposed:

<u>Date</u>	<u>Banks Lake</u>	<u>FDR Lake</u>
3/11 - start withdrawals	1570.0	1250 - 1260
3/26--4/5 - start pumping	1568.5	1235 - 1245
5/10 - pumping $\cong$ 6000 cfs	1568.5 $\pm$ 0.5	1220 - 1235
6/25 - max. pumping required	1568.5 $\pm$ 0.5	1275 - 1285
Minimum elevations:	1565.0	1208
10/25 - stop pumping	1570.0	1286.0 - 1290

NOTE: At upper elevations of Banks Lake, each foot of elevation change $\cong$ 25,700 acre-feet or 8.4 conventional pump days. Actual diversions will depend on flood control operation of FDR.

WINTER PEAKING (Pumped Storage) OPERATION

Load Projections. Rather than try to forecast loads, a plan to provide maximum generation capability in a minimum amount of time and operate on a weekly cycle is our objective.

<u>Gross Head</u>	<u>MW Capability</u>	
	<u>P/G-7-8</u>	<u>P/G-9---12</u>
280	46.6	45.67 1/
290	48.8	---
$\geq$ 293.5	49.5	---

The BPA will be apprised of unit availability and operating flexibility on a daily basis.

1/ January 28-29, 1983 - P/G-9 at 100% gate for commissioning.

P/G-7-8 Limitations. The major operating constraint is a maximum wicket gate opening of 82% for any given head. Although the generator is capable of a 115% continuous overload rating or 53 KVA, a 46.5 - 48.5 MVA will be used for nominal output capability.

P/G-9---12 Limitations. No known limitations at this time. At 280' gross head, the full gate output is over 45 MW with about a 1 MW increase at 290' head. Specific operating criteria will be developed during commissioning and acceptance tests.

Overall Operating Plan. A weekly cycle of pumped storage is planned during the months of December, January, and February. Pumping would occur between 2200 on Friday night and 0600 on Monday morning for a maximum of 56 hours depending on excess generation available to the Federal system for such pumping use. At 280' gross head:

	<u>Unit CFS</u>	<u>Pumped</u>	
		<u>Total CFS</u>	<u>A/F (56 hours)</u>
P/G-7-8	1948	3896	18,031
P/G-9---12	1912	7648	35,396
Total - 56 Hours			53,427

	Generating		
	Unit CFS	Total CFS	A/F (8-hour day)
P/G-7-8	2260	4520	2,988
P/G-9---12	2320	8880	5,871
Total - 8-hour day			8,859

40 hour week $\cong$ 44,295 acre-feet; 53,427 acre-feet $\cong$ 48 hour week. As noted below, pumping with conventional pumps may also be required. Minimum Banks Lake elevation for different generator configurations will be developed from experience. Weir and headwall will be limiting factors.

OFF-SEASON MAINTENANCE

Winter Period, P-1---6. Pump units P-1---6 may be available for maintenance activities from late October until April each year. If increased generation periods were required during winter peaking that exceeded P/G unit weekend pumping capability, some conventional pump operation may be required during the December---February period. (Drum gate maintenance may affect manpower.)

Summer Period, P/G-7---12. The major maintenance activities should be limited to March, April, May, and September, October, November. During the peak pumping periods of June---August, 10 of the 12 units will be in operation with one or both standby units available for immediate operation for first contingency failures.

Feeder Canal and Waterways. With the onset of winter peaking operation, the only two months available for Feeder Canal inspection/maintenance are March and November. Special consideration will have to be given to waterway maintenance until the wave dampening gates are modified and because we can now "saturate" the UNW header and backfill open suction elbows and draft tubes.

REFERENCES

Drawings. The historical hydrographs of Project water levels and flows will be useful in projecting future operations. (All are 222-117-xxxx drawings)

	1975	1976	1977	1978	1979	1980	1981	1982
Dam Hydrograph	15176	15235	15662	15768	16249	16442	16178	17047
Head, Gen. & Efficiency	15238	16824	15637	16073	16250	16443	16180	17048
Weekly Releases	15237	16823	15644	16074	16251	16444	16179	17049
FDR Lake	15236	16822	15645	15769	16252	16441	16177	17046

Columbia Basin Farm Deliveries, 1975--82

222-117-12364 Banks Lake Live Storage Capacity and Surface Area

Standing Operating Procedures (SOP's). Nameplate data and operating limitations are available in:

B-5 Pumps, P-1---6
B-6 Pump/Turbines, P/G-7-8
B-7 Pump/Turbines, P/G-9---12

B-16 Motor, P-1---6
B-17 Generator/Motors, P/G-7-8
B-18 Generator/Motors, P/G-9---12

Rating Tables for Pumping P-1---6
Rating Tables for Pumping/Generating P/G-7-8
Rating Tables for Pumping/Generating P/G-9---12

Memoranda

<u>From</u>	<u>To</u>	<u>Subject</u>	<u>Dated</u>
Chief, Operations Branch	Operations Personnel	Pump Operation	5/11/65
Project Manager, Ephrata	Chief Engineer, Denver	Capacity Test on P-3	6/25/69
Chief, Operations Division	Project Manager	Pumping-Past, Present & Future	6/28/76
Project Manager	Regional Director	Primary Pumping - Preferred Operation at Grand Coulee	7/14/82

Attachment No. 1

Energy Consumption (kWh)

<u>Year</u>	<u>P-1---6</u>	<u>P/G</u>	<u>Total</u>
1975	763,272,000	6,712,000	769,984,000
1976	628,313,000	214,567,000	842,880,000
1977	924,788,000	0	924,788,000
1978	718,139,000	65,569,000	783,708,000
1979	801,626,000	121,112,000	922,738,000
1980	311,286,000	174,447,000	485,733,000
1981	923,617,000	73,990,000	997,607,000
1982	858,412,000	0	858,412,000
Annual Average			823,231,000

Attachment No. 2

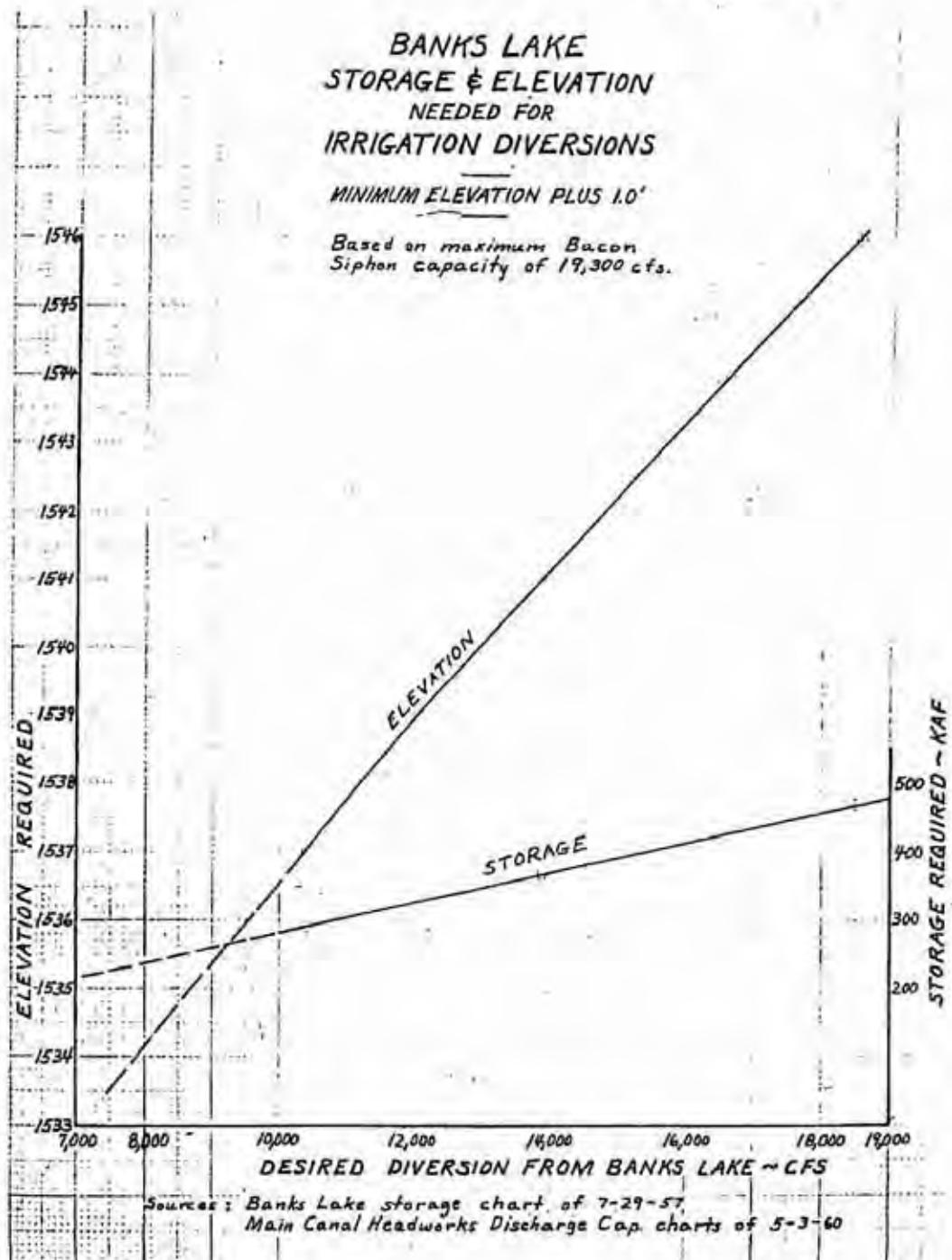
Difference in Irrigation Withdrawals and Our Total Pumped

<u>Year</u>	<u>Acre-feet</u>
1973	+ 215,969
1974	+ 35,638
1975	+ 59,145
1976	+ 108,448
1977	+ 95,496
1978	+ 38,470
1979	+ 125,621
1980	- 579,255 ^{1/}
1981	+ 701,257 ^{1/}
1982	+ 77,691

Annual Average = 87,848

^{1/} The unusually large numbers reflect the drawdown for Eurasian Watermilfoil freezing. A negative number indicates more water was withdrawn than pumped.

Attachment No. 3



Attachment No. 4

Page 1 of 2

PUMPING REQUIREMENTS AT GRAND COULEE
Electric Power and Energy and Water for Primary Pumping
at Grand Coulee-Median or Adverse Hydro

	<u>July</u>	<u>Aug. 1-15</u>	<u>Aug. 16-31</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Mar.</u>	<u>May</u>	<u>June</u>
*1980-81									
Peak MW	373	272	0	0	0	0	361	258	272
Energy MW	372	272	0	0	0	0	226	106	264
Water cfs	13,580	9,680	0	0	0	0	11,380	3,290	9,090
	<u>July</u>	<u>Aug. 1-15</u>	<u>Aug. 16-31</u>	<u>Sept.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>May</u>	<u>June</u>	
*1980-81									
Peak MW	373	272	180	135	90	0	258	272	
Energy MW	372	272	180	131	56	0	128	264	
Water cfs	13,580	9,680	6,400	4,690	2,000	0	3,970	9,090	
1981-82									
Peak MW	373	272	180	135	90	0	258	272	
Energy MW	372	272	180	131	56	0	135	264	
Water cfs	13,580	9,680	6,400	4,690	2,000	0	4,180	9,090	
1982-83									
Peak MW	373	272	180	135	90	0	258	272	
Energy MW	372	272	180	131	56	0	140	264	
Water cfs	13,580	9,680	6,500	4,690	2,000	0	4,340	9,090	
1983-84									
Peak MW	373	272	180	135	90	0	258	272	
Energy MW	372	272	180	131	56	0	144	264	
Water cfs	13,580	9,680	6,400	4,690	2,000	0	4,460	9,090	
1984-85									
Peak MW	373	272	180	135	90	0	258	272	
Energy MW	372	272	180	131	56	0	146	264	
Water cfs	13,580	9,680	6,400	4,690	2,000	0	4,540	9,090	

* Alternative schedules depending on Eurasian watermilfoil eradication program.

Page 2 of 2

	<u>July</u>	<u>Aug. 1-15</u>	<u>Aug. 16-31</u>	<u>Sep.</u>	<u>Oct.</u>	<u>May</u>	<u>June</u>
1985-86							
Peak MW	373	272	180	135	90	258	272
Energy MW	372	272	180	131	56	149	264
Water cfs	13,580	9,680	6,400	4,690	2,000	4,620	9,090
1986-87							
Peak MW	373	272	180	135	90	258	272
Energy MW	372	272	180	131	56	151	264
Water cfs	13,580	9,680	6,400	4,690	2,000	4,700	9,090
1987-88							
Peak MW	373	272	180	135	90	258	272
Energy MW	372	272	180	131	56	154	264
Water cfs	13,580	9,680	6,400	4,690	2,000	4,780	9,090
1988-89							
Peak MW	373	272	180	135	90	258	272
Energy MW	372	272	180	131	56	156	264
Water cfs	13,580	9,680	6,400	4,690	2,000	4,830	9,090

1989-90 through 1999-2000 same as 1988-89

COMMENT ID 03



The Great Spirit of the Columbia 1820-1900

South Columbia Basin Irrigation District

OFFICE 1135 E. HILLSBORO, SUITE A

TELEPHONE 509/547-1735 FAX 509/547-8609 • P.O. BOX 1006 • PASCO, WASHINGTON 99301

April 10, 2003

Mr. James Blanchard
Special Projects Officer
Ephrata Field Office
U.S. Bureau of Reclamation
P.O. Box 815
Ephrata, WA 98823-0815

Dear Mr. Blanchard:

Subject: Draft Environmental Impact Statement
Banks Lake Drawdown
Douglas and Grant Counties, Washington

Thank you for the opportunity to comment on the Banks Lake Draft Environmental Impact Statement dated January 2003, which analyzes the environmental impacts of the proposed action to lower the water surface elevation for Banks Lake from 1,565 feet to 1,560 feet in August of each year.

It is the District's position that the DEIS does not evaluate all the impacts of the proposed action. For this reason, the South Columbia Basin Irrigation District joined with the East and Quincy-Columbia Basin Irrigation Districts and Grand Coulee Project Hydroelectric Authority to hire Tetra Tech (Foster Wheeler Environmental Corporation) to conduct a complete, independent third-party technical review of the DEIS. The District's goal was to have an impartial review of the applicability of NEPA requirements and to fill in the voids of a scientific analysis. Additionally, the District contracted with Chris Von Holmes and James Anderson of Columbia Basin Research to model the proposed flows addressed in the scenarios put forth in the DEIS to identify the actual benefits to Snake River fall chinook smolts migrating through the Columbia River System during the proposed drawdown period.

The Tetra Tech review is attached hereto and included in these written comments by reference. The document in its entirety encompasses the District's views, concerns, and comments. The final EIS needs to address all the issues identified.

01

Mr. James Blanchard

Page 2

April 10, 2003

The District realizes the need for the operational drawdowns of Banks Lake on an infrequent basis for maintenance activities. The District is firm in its standpoint that the operational flexibility for Banks Lake be maintained for Project purposes, which would include deep drafts to elevation 1,545 feet as needed for maintenance activities.

01

The District emphasizes that the actual implementation of RPA 23, the 5-foot drawdown, is not identified in the document as an Action Alternative. We believe that a 5-foot drawdown IS an Action Alternative because it differs from the normal operation of the reservoir. For the past decade or more, Banks Lake has been operated during the irrigation season at 1,568 to 1,570 feet. Elevations have varied due to load volume and pumping conditions in order to accommodate the most efficient power generation and pumping efficiencies for BPA. Any change in that historical operation should be identified in the DEIS as an Action Alternative.

02

The American Heritage Dictionary defines *opinion* as "a belief or conclusion held with confidence but not substantiated by positive knowledge or proof." The 2000 FCRPS Biological Opinion, RPA 31, is an opinion, and the lack of proof of an ESA-listed salmonid benefit does not merit the implementation of drawing down Banks Lake to elevation 1,560 during the month of August of each year.

03

The independent third-party technical review indicates that the flow augmentation effect on ESA-listed salmonid stocks in the lower Columbia River would be infinitesimal—*less than one fish for every ten thousand smolts*. The 5-foot and 10-foot drawdowns listed in RPA 23 and RPA 31 have not been selected by the use of any scientific process. The numbers seem to have been selected arbitrarily for their convenience. The District does not support and will not support the use of Columbia Basin Project facilities under conditions that are not supported by sound science.

Sincerely,



Shannon McDaniel
Secretary/Manager

SM:kgm

Enclosure

cc/enc: Senator Patty Murray
Senator Maria Cantwell
Representative Doc Hastings
Representative George Nethercutt
USBR Commissioner John Keys

Review of Draft Environmental Impact Statement on the
Proposed Banks Lake Drawdown

prepared for

East Columbia Basin Irrigation District
Quincy-Columbia Basin Irrigation District
South Columbia Basin Irrigation District
Grand Coulee Project Hydroelectric Authority

prepared by

Tetra Tech (Foster Wheeler Environmental Corporation), Inc.

April 2003

This report was included with the East Columbia Basin Irrigation District letter of comments, which begins on page 299, and is not repeated here.

COMMENT ID 04

Quincy-Columbia Basin Irrigation District

Telephone (509) 787-3591 Fax (509) 787-1906

Post Office Box 188

Quincy, Washington 98848

April 10, 2003

Mr. Jim Blanchard
United States Bureau of Reclamation
PO Box 815
Ephrata, WA 98823-0815

RE: Comments to Banks Lake Drawdown Draft Environmental Impact Statement

Dear Mr. Blanchard:

The Quincy Columbia Basin Irrigation District appreciates this opportunity to comment on the Banks Lake Drawdown Draft Environmental Impact Statement.

To aid the Columbia Basin Irrigation Districts in evaluating and commenting on the proposed DEIS, the Districts contracted with an environmental corporation Tetra Tech FW, Inc., who's report will be referred to and made a part of the Quincy Districts comments.

The Quincy District is opposed to the No Action Alternative as outlined in the DEIS. "No action" should be meant to mean Banks Lake would continue to operate in the same historical manner as it has been in the past which shows the lake at above 1565 95% of the time. However, the proposed No Action Alternative seems to have been derived from the 2000 Federal Columbia River Power System Biological opinion where the Bureau of Reclamation would operate Banks Lake with a five foot drawdown in the month of August. The Bureau should include a third alternative in the DEIS that contain drawdown scenarios to elevation 1565 as an action item.

By drawing the lake down to elevation 1565, the DEIS says there would be 133,600 acre-feet of water available to increase stream flow for fish migration targets during August. As part of the DEIS process, the Bureau should have made an investigation as to whether or not there is any real scientific justification to return 133,600 acre-feet to the Columbia River. As will be discussed further, the Quincy District believes there is evidence to show little or no benefit exists.

In addition to the No Action Alternative, the Quincy District is also very much opposed to any proposal that includes an annual drawdown to an elevation of 1560 for the possibility of meeting flow augmentation targets at McNary Dam. The District is again of the opinion that the DEIS is flawed by not addressing whether or not there is any scientific justification that additional water from Banks Lake will aid in the ESA-listed juvenile salmonid stocks out-migration. The District believes the Bureau must address

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the issue of justification before any action involving drawdowns are proposed or implemented.

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On February 10, 2003, the Independent Scientific Advisory Board for the Northwest Power Planning Council, the National Marine Fisheries Service and the Columbia River Basin Indian Tribes issued a report the purpose of which was to update and clarify its review of flow augmentation on the lower Columbia and Snake Rivers. The Advisory Board concluded the prevailing flow-augmentation model, which asserts that in-river smolt survival will be proportionally enhanced by any amount of added water, is no longer supportable and does not agree with information now available.

04

This latest information, from the science community, would support an argument for an action to leave the operation of Banks Lake status quo until alternatives have been developed that have both scientific justification and practical value for managing the hydro-system for multiple uses including salmon recovery.

In addition, Tetra Tech FW, Inc. evaluated the impacts of the various proposed Banks Lake drawdowns to the lower Columbia by using the Columbia River Salmon Passage model (CRISP) to see if there is any benefit to migrating smolts. Modeled August flow adjustments indicated spring migrants were not affected because the fish have migrated out of the river system before August. At average to low flows, the survival change from the Banks Lake drawdown is between 0.00001 and 0.00002 and at high flows the maximum survival rate increase was less than 0.000005. To put these changes in perspective, a Banks Lake drawdown of ten feet in August would only increase the number of smolts reaching Bonneville Dam by between 6 to 13 smolts out of an average total of 630,000. The corresponding reduction in travel time between McNary and Bonneville Dams is, at most, one hour in a nine-day travel time. Most scenarios increased travel time to Bonneville Dam by less than 14 minutes on travel times of about two weeks.

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This modeled analysis clearly shows, for all practical purposes, an insignificant benefit to migrating smolts and further substantiates the Districts position of no drawdowns.

In regards to irrigated agriculture, the DEIS stated it's possible for Reclamation to deliver the capacity of the main Canal (10,000 cfs) down to elevation 1537 and put forth conditions that may trigger a lesser drawdown such as drought, mechanical failure or Reclamation's inability to refill Banks Lake by September 10th. However, by locking into an annual drawdown for purposes other than O & M the Quincy District believes there remains an element of uncertainty for refill that could impact the next years irrigation season. Drawdowns for O & M purposes are justifiable necessities where a considerable amount of doubt exists as to whether the proposed Action or No Action Alternatives are justifiable to benefit fish.

06

- 3 -

April 3, 2003

On an annual basis, if the No Action Alternative is implemented to bring Banks Lake elevation down to elevation 1565 or the Action Alternative to elevation 1560 the impact to recreation is underestimated, not only to the user but to area businesses as well.

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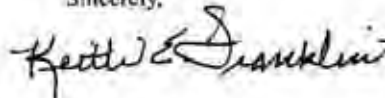
For instance, the DEIS points out that seven of the twelve boat launches will be unusable at elevation 1565 and only two will remain usable at elevation 1562 with no launches usable below the south half of the lake including Steamboat Rock State Park. The DEIS suggests users that would normally use Banks Lake during August could move to other available recreational facilities in the area such as Lake Roosevelt. This might be okay for the users if they are willing to go elsewhere, but the affected businesses don't have the flexibility to relocate. More than likely, traditional August lake visitors will quit coming to the area altogether. Again, why promote an action that will create a detrimental impact to area business without sound justification.

The Columbia Basin Project, of which Banks Lake is a major facility, was authorized by Congress as a multi-purpose federal reclamation project to provide benefits for irrigation, power, recreation, fish and wildlife, domestic, municipal, industrial, and miscellaneous uses. Practically every beneficial use intended by Congress is harmed and damaged to some degree (some to a much greater degree than others) by the proposals in the DEIS without any demonstrable, scientific or measurable benefit to out-migration of fish, which benefit in the final analysis should be the basis for any drawdown of Banks Lake other than for required operational purposes.

08

For a more thorough and in-depth analysis of the DEIS, the Quincy District includes Tetra Tech FW, Incorporation's review as part of its comments for Reclamation's consideration. If you have any questions feel free to contact me at this office.

Sincerely,



Keith Franklin
General Manager

KF/mb

cc: John Baird
East Columbia Basin Irrigation District
South Columbia Basin Irrigation District
Grand Coulee Project Hydroelectric Authority
Board of Directors

Review of Draft Environmental Impact Statement on the
Proposed Banks Lake Drawdown

prepared for

East Columbia Basin Irrigation District
Quincy-Columbia Basin Irrigation District
South Columbia Basin Irrigation District
Grand Coulee Project Hydroelectric Authority

prepared by

Tetra Tech (Foster Wheeler Environmental Corporation), Inc.

April 2003

This report was included with the East Columbia Basin Irrigation District letter of comments, which begins on page 299, and is not repeated here.

COMMENT ID 05

Quincy-Columbia Basin Irrigation District

Telephone (509) 787-3591 Fax (509) 787-3906
Post Office Box 188
Quincy, Washington 98848

April 10, 2003

Jim Blanchard
United States Bureau of Reclamation
PO Box 815
Ephrata, WA 98823-0815

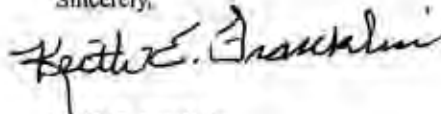
RE: Comments to the Banks Lake DEIS

Dear Mr. Blanchard:

On behalf of landowners and citizens of the State of Washington I am forwarding signed comments opposing the proposed drawdowns of Banks Lake as outlined in the Draft Environmental Impact Statement.

01

Sincerely,



Keith E. Franklin
General Manager

KEF/mb

Enclosure

Feb. 22, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

02

1. The idea is theoretically supposed to help spawning salmon; however, statistics record that only once in 50 years would the effect actually have this effect.
2. The action WOULD DEFINITELY affect the recreational use of Banks Lake by leaving boat launches, and other attractions high and dry. Recreation is one of the primary focuses of the Columbia Basin Project and will definitely hurt those who use the lake for recreation and those who make a livelihood from recreation.
3. The draw down will also hurt the district's generating capacity at the hydropower plant at the south end of the lake.
4. There is a concern that the supply of irrigation water could be hampered in a scenario such as three years ago. Then, a fire knocked out some of the large pumps that draw water from behind Grand Coulee Dam into Banks Lake, which is then diverted through the project's system of canals and reservoirs. Since there have been late-season problems the last three years, this is a definite problem.
5. We will not stand idle as another example of sacrificing a rural community to the altar of Endangered Species Act goes forth. The Bureau of Reclamation cites the communities of Forks, Washington; Orofino, Idaho; and Klamath Falls, Oregon as examples of such sacrifice.
6. There have been no hearing in the Royal City community and by our signature we are requesting a public hearing before the close of the public comment. If not possible by the March 10 date, then we demand an extension of the public hearing process. Inadequate time for studying the documents and making intelligent comment has been allowed.

Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	Kenneth Wilson	1587 Barclay Ln	785-7071	
<i>[Signature]</i>	Jason R. Smith	5021 SE Quincy	787-0153	
<i>[Signature]</i>	Jane Henshaw	PO Box 5525 George	785-2316	
<i>[Signature]</i>	Elaine Hansen	2214 Hill N. Quincy	785-6515	
<i>[Signature]</i>	Martin Hansen	2236 N. 21 N. Quincy	785-6515	
<i>[Signature]</i>	John R. Hansen	1143 Rd 1 N Quincy	785-6515	
<i>[Signature]</i>	Larry Van Nest	2429 Rd 17 N Quincy	787-4618	
<i>[Signature]</i>	Mari M. Richman	9986 Jackson Rd. Edwats	787-7674	
<i>[Signature]</i>	Kenneth A. Richman	" " " "	787-7674	
<i>[Signature]</i>	Samuel T. Krautheim	247 H St SE 3rd	787-7181	
<i>[Signature]</i>	CARL BLAKERT	1630 R4 BNE Moses Lake WA	785-9947	

Feb. 22, 2003

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Signature	Printed Name	Address	Telephone	E-mail
	Josh Roberts	5857 R12 Ephrata	509-787-8416	
	Bill Hildebrand	3986 Rd 1 Pnw, Quincy	509-787-3630	
	Gerald K. Hinde	18054 13 NW Ephrata	509-787-9424	
	Patricia Conolly	371 Hwy 281 N Quincy	509-750-4602	
	Kent T. Karsner	6258 Rd 115 NW	509-787-4255	
	Jeffery R. Loukner	412 I St SE Quincy	787-4821	
	Jim Talbot	21410 Rd 3 NW Quincy	787-4246	
	Tony Flint	5842 Rd 2 NW Ephrata	787-3023	
	HELMUT H. HINTZ	1911 ROS-NW EPHRATA	787-2003	
	LYNN A. CHILD	6243 Rd Pnw Quincy	787-3055	
	GEORGE V. JANKUS	12480 14145 SW QUINCY	546-2007	

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Feb. 22, 2003

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Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	Randy Alford	Bozeman	509-346-2314	
<i>[Signature]</i>	Ed H. Spalding	Royal City	346-2463	
<i>[Signature]</i>	John Platt	Bozeman	509-281-2058	
<i>[Signature]</i>	Bill Watson	Box 306 Quincy	509-287-1122	
<i>[Signature]</i>	Debra Schaefer	Ellensburg WA	509-884-2010	
<i>[Signature]</i>	Margaret Tanager	Quincy WA	509-287-3591	
<i>[Signature]</i>	Mike DeLong	Ellensburg WA	509-884-3100	
<i>[Signature]</i>	Audrey Rose	Quincy WA	509-285-2291	
<i>[Signature]</i>	Marilyn Blum	Quincy WA	509-287-9100	
<i>[Signature]</i>	Lyndy Roberts	Ellensburg WA	509-287-4447	
<i>[Signature]</i>	Dean Evans	17188 Rd 51W Quincy WA	95848	

00 d 76161

Feb. 22, 2003

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Signature	Printed Name	Address	Telephone	E-mail
<i>Richard Stevens</i>	Richard Stevens	22662 Rd F NE Soap Lake WA	98951	
<i>Tom Morris</i>	Steve Morris	6549 Rd G NW Ephrata WA	98823	
<i>Garth A. Ginter</i>	GARTH A. GINTER	11654 15th SE Royal OR	97134	
<i>Steve Brader</i>	Steve Brader	6620 Chippawm Dr NE Moses Lake WA	98837	
<i>John Saure</i>	JOHN SAURE	5501 Rd E NW Ephrata WA	98823	
<i>Randy Turko</i>	Randy Turko	15291 Birchman Hill Rd Quincy WA	98848	
<i>Brandi R. Riney</i>	Brandi Riney	11021st Ave SE Quincy WA	98848	(509) 787-2881
<i>Ann Morrill</i>	Ann Morrill	2145 1st St Quincy WA	509-787-3147	
<i>David Callaway</i>	DAVID CALLAWAY	7023 Hwy 20N	509-787-2201	
<i>Shirley Woodworth</i>	SHIRLEY WOODWORTH	6537 Rd D SNE - MIKE'S LAKE	98856	
<i>Kathy Delany</i>	Kathy Delany	5754 Rd I NE Ephrata WA	98823	781-23 771-311

Feb. 22, 2003

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[illegible]

Feb. 22, 2003

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Signature	Printed Name	Address	Telephone	E-mail
<i>Mike Rothrock</i>	Mike Rothrock	6467 Rd 7NW Ephraim	(509) 782-7044	
<i>Jim Bishop</i>	Jim Bishop	7271 Dividend Lake Rd Quincy	509-187-4219	
<i>Chris Reilley</i>	Chris Reilley	14115 N 13th Ave Kennewick	509-382-1515	
<i>Steve Forester</i>	Steve Forester	2320 RD 11 MUKQUAY WA	98898	
<i>Blair F. Egan</i>	Blair F. Egan	1645 PEDRO CIGARON	3975 Rd 11	

E-mail: 782-6107

Interested Entities and Individuals — IE

COMMENT IE 01

From: Maurice Anding <annandy@imbris.net>
To: <jblanchard@pn.usbr.gov>
Date: Sun, Apr 6, 2003 3:24PM
Subject: Banks Lake Level

I am not in favor of drawing down Banks Lake in the late summer. I like to fish Banks Lake for walleye, and as I understand, the boat launches would not be useable. As it is now the lake is dangerous in the late summer/fall. If anything, I would be in favor of leaving it higher.

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Maurice Anding

3711 Broken Arrow Rd

Coeur d'Alene ID 83815

COMMENT IE 02

From: "Roger & Denise Arango" <rarango@earthlink.net>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Mar 26, 2003 9:19AM
Subject: Banks Lake Drawdown

Dear Mr. Blanchard:

I would like to comment on the Banks Lake Drawdown. Please note that I am NOT IN FAVOR of this drawdown. I think it will be a very big mistake for this area, as well as for the communities who rely on the lake for their businesses.

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I am against any action that will reduce water levels in Banks Lake.

Sincerely,

Denise Arango
7180 Summit Avenue SE
Othello, WA 99344
Phone: 509-346-2676
Fax: 509-346-2136
Cell: 509-760-1195
(I live in Grant County, WA)

COMMENT IE 03

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of **August and September**.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

Sam + Jessica Bafus, 209 E. Cunningham Rd., Leil, Wa. 99341-9740

The water should not be lowered in Banks Lake for a questionable worthiness of using that water for a questionable method of flushing salmon. ----, lowering Banks Lake will leave more mosquito-problem areas if drawn down. It will hurt all the businesses in the area that depend on the fishing/tourist trade. The loss to farmers and electricity sales are also an issue. We strongly say the water level should be left alone.

Feel free to use back of form or attach a separate piece of paper.

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COMMENT IE 04

From: "Larry and Barb Richardson" <larbar@odessaoffice.com>
To: "Jim Blanchard" <jblanchard@pn.usbr.gov>
Date: Fri, Mar 14, 2003 11:41AM
Subject: Banks Lake Drawdown

My name is Larry Richardson D.B.A., Banks Lake Net and Charter. I am the contractor that has installed and maintained the barrier net in Banks Lake for the last 23 years . The five foot drawdown, while an inconvenience does not affect the operations of the barrier net to any great extent. A 10 foot drawdown however is a different matter. At 10 feet down leaves the east west net with about 2 feet of water for the entire distance from the shore to the island. The net that is laying on the bottom of the lake gets destroyed by the wave action trashing it against the rocks. On the North South net the lower water levels, even at 5 feet lower, destroy the net by the constant wave action against the rocks on approximately 50 feet on each end, the east west net would need to be replaced on an annual basis, the north south net would need major repairs at the end of the each season. The maintenance and cleaning would be problem also because the boat harbor would not have enough water to float the wash barge and boat needed to clean and maintain the net. I feel a 10 foot drawdown would really hinder our efforts to keep fish in Banks Lake and protect this valuable resource. Thanks for your consideration on this matter.

Larry Richardson

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COMMENT IE 05

BASIC AMERICAN FOODS538 Potato Frontage Road
Moses Lake, WA 98837

(509) 763-8601

Mr. Jim Blanchard,
Special Projects Officer, Bureau of Reclamation
32 C Street, PO Box 815
Ephrata, WA 98823-0815

RE: Written Comment on Proposed Comment on Proposed Banks Lake
Drawdown

Dear Mr. Blanchard,

Please find below written comment from Basic American Foods regarding the
proposed drawdown of Banks Lake.

Basic American Foods is opposed to all of the alternatives addressed in the DEIS on the Banks Lake drawdown. The basis for our opposition is two-fold. First, the Columbia Basin Project is the lifeblood of the agriculture industry in the Columbia Basin. The impacts of drawing down Banks Lake could be catastrophic to growers if the pumps at Grand Coulee suffer any major mechanical breakdown. For example, in 2001 a series of mechanical problems with the pump/generating plant reduced the pumping capacity by 75% for an extended period. If 2001 had not been the year of the BPA irrigation buyback, which fallowed much of the CBP, a serious draw down would have occurred placing irrigation deliveries in peril. The DEIS does not ever address just how much water is needed in the mainstream Columbia for returning juvenile salmon. The DEIS summary states "increased Columbia River flow should benefit salmon." The DEIS also estimates that the drawdown will make it more likely that the Columbia River flow will hit the targeted 200,000 cfs flow only one out of 50 years. Without good science as to what flow actually is needed for returning juvenile salmon, a decision to drawdown Banks Lake is premature and therefore pointless at this time. We feel the real impacts of the drawdown far outweigh the estimated benefits.

Secondly, the recreational impacts to the drawdown are huge, not only to the economics of the operations that service the recreation on Banks Lake and the surrounding area but also to the people that use Banks Lake for recreation. Drawing down the lake below current operational levels during the peak recreation month of August is totally unacceptable. A draw down will not only impact the business recreation community but also impact the quality of life to the local and tourist population.

In conclusion Basic American Foods opposes any and all alternatives listed in the DEIS that go away from the current operational practices of Bank Lake.

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Drawing down Banks Lake for the sole purpose of "estimated" benefits to returning juvenile salmon is not sound best management practices and other options should be explored and more research done before such a drawdown is attempted.

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Sincerely,



Mike Dodds, Basic American Foods

COMMENT IE 06

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

*I am a resident of central WA.
I don't believe the water level
should be drawn down in
Banks Lake in August & Sept.
Those are important months for
the tourist industry & the economy
of this area. We all should work
together to put WA's best foot
forward for our visitors!!!
Keep Washington Beautiful!!!*

Feel free to use back of form or attach a separate piece of paper.

*Dora Bauman
Wilson Creek,
WA 98860*

01

COMMENT IE 07

Coulee City still needs you!



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We need this lake!! We are a small town & the park & lake provides much of our entertainment for the children & also adults. - Fishing, boating, picnics & ^{swimming} play equipment. Without it we should be lost.

People staying at our park use our grocery store, service stations, restaurants & taverns. This keeps our town going.

Feel free to use back of form or attach a separate piece of paper.

Roy & Laurena Bechtel

01

COMMENT IE 08

Mr James Blanchard-Manager
Banks Lake Drawdown
Bureau of Reclamation
POB 815
Ephrata, WA 98823

April 10, 2003

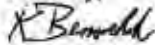
Dear Sir,

I request that you record this letter in Opposition to the Banks Lake Drawdown as an official part of the record.. I and my children swim in the lake in the summer by walking to the lake shore and entering the lake. I have seen what previous drawdowns do to boating and swimming. This drawdown will expose swimmers to having to walk several hundred feet over stagnant water and mud flats, infested with diseased mosquitoes. Local businesses have a brief summer window of opportunity to make their annual sales. The BAR will devastate local businesses by the draw on causing tourists to go elsewhere. Water is available to enhance Columbia River flows from Canada, and the Snake River, so there is no need for this draw on. Salmon returns at record high levels as evidenced by statistics at the US Army Corps of Engineer website. It is obviously ocean conditions that largely govern salmon populations. The conclusions drawn in the draft IS are outrageous and self serving.

The West Nile Virus that is now in Washington, and the probability that it will be enhanced by the draw on is documented by the Washington Dept of Health. Birds and humans die from the West Nile Virus.

I request additional time to study and evaluate the Draft IS, as the complexity of this document is substantial.

Sincerely,



Ken Benoschek
POB 998
Soap Lake, WA 98851

01

02

COMMENT IE 09

January 10-03
Grand Coulee - WA.

Sirs:

I would suppose that it's about time for you screw Banks Lake again. The lake is recovering from the big draw down in which you totally destroyed the Muskrat population. The crappie population was destroyed, and in fact the crappie have never come back.

It's too bad that you people can't keep your clammed hands off Banks Lake.

It's my sincerest hope that there will be no much opposition to your assinine proposal that you won't consider it again.

Keep your hands off Banks Lake and you can put me down as most definitely opposed to your proposal.

Sincerely yours,
Claude E. Bjorson



Claude E. Bjorson
P.O. Box 63
Grand Coulee, WA 99133-0063

01

COMMENT IE 10

From: Gary Viers <mbott-gviers@pomeroy-wa.com>
To: <jblanchard@pn.usbr.gov>
Date: Fri, Apr 11, 2003 8:51AM
Subject: (no subject)

I strongly oppose the drawdown of Banks Lake. The effect on agriculture and the communities agriculture supports will be devastating.

Muriel Bott
Box 261
Pomeroy, Wa 99347

01

COMMENT IE 11

Terry Brewer
19797 Fairway Drive NW
Soap Lake, WA 98837

April 7, 2003

Mr. Jim Blanchard
Bureau of Reclamation
P.O. Box 815
Ephrata, WA 98823-0815

Re. Banks Lake Draw Down, Grant County, Washington, Draft EIS

Dear Mr. Blanchard:

I am writing to comment on the above-mentioned EIS. My main concerns are economic and are related to the lack of detail in the economic section of the report. It would appear that the report was written from the perspective of a biologist or botanist and that is understandable to a point. However, from the perspective of someone who resides in the Sun Lakes area south of Banks Lake, I am quite concerned with the economy of the region and I am disappointed that the report did not cover the economics of the proposal and the effect or impact of the proposal on the local and regional economy in a manner such as an economist could have reported on the subject.

One only has to speak with the Tourism Section at the Washington State Department of Community, Trade and Economic Development to begin to gather statistics and data related to the income and impacts generated by tourism in a given County. The anecdotal information that they have on file suggests that Tourism in Grant County as a whole is impacted by the level of Tourism in the greater Banks Lake area. The data reflects a sharp downturn in tourism following the 1994 draw down of Banks Lake to a point where beaches became mudflats and boat launch facilities and mooring docks were unusable.

It was 1998 before the local business owners of lodging facilities, restaurants, and retail stores achieved pre-1994 levels of business during the time period of the draw down. This was during a period of rising incomes and expenditures in Washington State. That same period was a time when tourism activities and expenditures were increasing in other parts of Washington. One only has to survey the local business owners near Banks Lake to understand that a common belief among tourists during the period of 1994-1998 was that the water pool of Banks Lake would be at an unusable low level in August and early September.

As a practitioner in the field of economic development I know how important tourism is to the Banks Lake area economy and to Grant County as a whole. There are a significant number of communities that benefit from tourists that travel to Banks Lake for fishing and water sports. The proposed draw down will have negative effects on our regional economy and incomes.

01

Mr. Jim Blanchard
April 7, 2003
Page 2

Another concern that I have is the West Nile Virus. It is known that mosquitoes in Washington are carrying the virus. With the proposed Banks Lake draw down, the vast areas of exposed mud flats will have pools that will not drain completely and those pools will become a perfect breeding ground for mosquitoes. Infected mosquitoes could easily infect bald eagles resulting in countless deaths among the local population. Of course the local area human population will also be prey to those same mosquitoes.

02

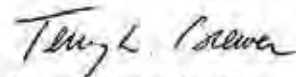
I understand that while the Bureau of Reclamation was ordered to conduct the EIS on the proposed Banks Lake draw down, that there is no mandate to act or implement the draw down regardless of the outcome of the EIS. I would urge the Bureau to not draw down the waters of Banks Lake below the current minimum elevation levels during August and September.

03

If an increase in Lower Columbia River flows must be achieved during August I would strongly urge that the draw down to be made in the Lake Roosevelt reservoir. A draw down of one and one-half feet at that time of year would have little economic or environmental effect on the area. That alternative is one that must be considered.

Thank you for your consideration of my concerns and comments. Please keep me apprised of further developments in this matter.

Sincerely,



Terry L. Brewer, CECD

COMMENT IE 12

March 20, 2003

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street, PO Box 815
Ephrata, WA 98823-0815

Re: Banks Lake Drawdown

Dear Sir:

Since the creation of Banks Lake the Coulee City people and tourists have certainly enjoyed the swimming, fishing, boating, picnics or just relaxing in or near the lake.

With the drawdown plan the swimming area would be "waterless", the boat docks "high and dry" for approximately 1/2 of the summer season.

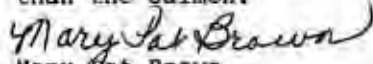
This would mean:

loss of revenue versus salmon needs
loss of recreation versus salmon needs
loss of tourism versus salmon needs

I'm simple enough to say it really is:

people versus salmon

Thank you for considering people more important than the salmon.


Mary Pat Brown
PO Box 866
Coulee City, WA 99115

Member of Chamber of Commerce
60 yr resident of Coulee City

01

COMMENT IE 13

From: "Pat Burdick" <patfusae@bentonrea.com>
To: <jblanchard@pn.usbr.gov>
Date: Mon, Mar 24, 2003 7:51PM
Subject: Banks Lake Drawdown

Mr. Jim Blanchard:

I'm writing you this note to voice my opposition to any drawdown of Banks Lake to supplement Columbia River flows. I don't support this proposal for Banks Lake drawdown nor do I see any benefit to fish. I don't believe NMFS has any basis in Science for this proposal and request Bureau of Reclamation withdraw local support. I do see harm to the local economy, a potential long term threat to the agriculture of the Basin, and a detriment to local recreation.

I vote no on Banks Lake drawdown. Please ensure this opinion is duly registered.

Thanks for your time and consideration.

Pat Burdick
276 Maringo Road
Ephrata, WA 98823
754-5863

01

COMMENT IE 14

From: ANNE CARTER <carter5521@yahoo.com>
To: <jblanchard@pn.usbr.gov>
Date: Thu, Apr 3, 2003 5:37PM
Subject: Public Response on Bank's Lake

Dear Mr Blachard;

I am writing in response to a newspaper artical In the Grant County Journal regarding the proposed drawdown of Bank's Lake. My question to you is "Are trying to kill the tourism in this area?" If you drawdown the lake that much I wont be going there this summer to go camping if I have to deal with nothing but MUD. I am sorry but I know other people as well that have the same reaction that I do. We wont go! It is an insane idea to even think that the action that is proposed will help salmon. The salmon numbers have been going up every year, why would you think we still need to come up with stupid actions to try and help them. Let them be. They are making a come back all on there own without the Bureau of Reclamations help. What are you all just a bunch of PETA employees. Everything I have been seeing lately that has anything to do with your Department is just outrageously stupid. I know that the drawdown of the lake is a bad thing for the economy of this area. It sure isnt going to help anything if you do that. So this is one citizen that says NO to drawing down Bank's Lake.

01

Anne Carter

Ephrata, WA.

Do you Yahoo!?

Yahoo! Tax Center - File online, calculators, forms, and more

COMMENT IE 15

Mr James Blanchard
Bureau of Reclamation
POB 815
Ephrata, WA 98823

April 9, 2003

Subject: Letter of Record in Opposition to Banks Lake Drawdown

Dear Sir,
I oppose the Banks Lake Drawdown for the following reason:

The Draft EIS fails to definitively address the devastating effect upon local businesses,

01

The Draft EIS fails to address denied local fishing and swimming opportunities for residents

02

The Draft EIS fails to address that water is available to enhance Columbia River flows from Canada, and the Snake River

03

The Draft EIS fails to address the mosquito breeding opportunity from drawdown caused mud flats and stagnant water pools.

04

The Draft EIS fails to address the West Nile Virus that is now in Washington, and the probability that it will be enhanced by the drawdown, and specifically impact the Banks Lake population of Bald Eagles.

We need additional time for comments as the Draft EIS is incomplete.

05



Wilbur Carter
POB 252
Soap Lake, WA 98851

COMMENT IE 16

Coulee City still needs you!



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Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

*We don't understand the purpose of a 10 foot
draw down of Banks Lake at any time, but, the
months of August and September are particularly
busy months for boating, swimming, fishing and
use of water toys and skiing. The economy of
Coulee City, Coulee Dam, Electric City and the
whole Sun-lakes area will be impacted by
such action. Therefore we strongly object to
this proposal. Donald & Center.
Freda Center*

01

Feel free to use back of form or attach a separate piece of paper.

COMMENT IE 17

From: "Tom Grebb" <tom@centralbean.com>
To: <jblanchard@pn.usbr.gov>
Date: Thu, Apr 10, 2003 10:40PM
Subject: Banks Lake Drawdown

April 10,2003

To Whom It May Concern:

I oppose the Banks Lake Draw Down Proposal. The proposed draw down does not have conclusive evidence benefiting fish. At the same time could impact recreation and most importantly impact irrigated agriculture.

Water is needed for recharge of the region as well as the draw down potentially effecting supplies on years when drought is a consideration.

Please do not proceed with the draw down of Banks Lake.

Tom Grebb
President
Central Bean Co. Inc.
Quincy WA

01

COMMENT IE 18

4-6-03

To Whom it may Concern-

The property at 4703 RD 3 N.W. Ephrata is all sage brush. We do not irrigate or farm and we do not have a well for domestic use.

We feel that it is very unfair to have our property taxes raised to pay for something we do not receive or use. If and when we are given water rights to use or start to use said irrigation waters. We would still consider opposing any draw down of Banks Lake.

We will fight the automatic taxation of our land for water we do not have or receive.

Yours Truly
James Chamberlain
Ted Hayes

4703 RD 3 NW

Ephrata WA 98823

01

COMMENT IE 19

From: Arlene Coates <theram@centurytel.net>
To: <jblanchard@pn.usbr.gov>
Date: Sat, Mar 29, 2003 10:40AM
Subject: Banks Lake

I feel that lowering Banks Lake 10 feet would ruin the economy of Coulee City because the fishing would be ruined as this is the busy season for recreation in this area and the businesses in this area would close.

Banks Lake is not a reservoir but a holding area for runoff and it is used for irrigation of the farms in the area which lowering the lake would also effect the farmers. If you lower the lake you may as well put a death sentence on the town of Coulee City and the businesses here.

The fishing is just now starting to come back from the last time the lake was lowered several years ago.

Arlene Coates
P.O. Box 816
Coulee City, Wa. 99115-0816
509-632-5422
theram@centurytel.net

01

COMMENT IE 20

April 8th, 2003

Bureau of Reclamation
Attention: Jim Blanchard, Special Projects
P.O. Box 815
32 C Street N.W.
Ephrata, WA 98823

Dear Mr. Blanchard

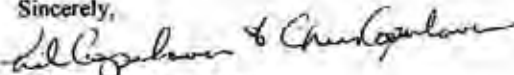
We are writing in regards to the Banks Lake draw down and it's impact on our immediate family and normal summer plans.

The last eight to nine years we have enjoyed our slip at the Coulee City Marina. It has been a great place to relax, swim, lie in the sun and take our sail boat out for the day. Many weekends we stay on our boat overnight during the summer. We have had week long vacations on the lake and have enjoyed the entire lake. Overall, we have fond memories and want to continue these each summer.

Last summer the draw down was about ten feet. The water was so low we hardly left the marina due to weeds and offshore shallow spots. A couple of times my boat struck the bottom of the lake. If the lake had not been so low, it would not have been a problem.

We also know that the last major draw down of the lake, for dam maintenance, had a long-term effect on the local economy. It has taken years to recover as a recreational area. When the lake is lowered, mud flats are exposed which affects the wet lands ecosystem. Our opinion is that if any draw down occurs it should be after Labor Day.

Please consider whom, why and how this draw down will influence everyone before implementing it.

Sincerely,

Phil & Chris Copenhaver
1240 Pershing
Moses Lake, WA 98837

cc: Senator Patty Murray
Senator Maria Cantwell
Congressman Doc Hastings

01

02

COMMENT IE 21

From: Margaret Davis <Imdavis@moseslake-wa.com>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Apr 9, 2003 9:16PM
Subject: NO Drawdown

Mr. Blanchard:

The impact of drawing down Banks Lake would greatly impact the farming communities in the Columbia Basin. Adequate water is needed (!) for the variety of crops grown in the Basin. Potatoes and corn are still irrigated in the months of August and September. The Banks Lank was designed for a reservoir for irrigation we thought. One of the benefits from irrigation is the fact that this water is also used for recreation. Drawing down Banks Lake is NOT in the best interest of Washington farmers.
Lee & Margaret Davis

01

COMMENT IE 22

March 10, 2003

Dear Mr. Blanchard,

We are opposed to drawing down Banks Lake.

The "effects" don't know if it will help the salmon survival, but we do know it will affect the economic survival of the people in Coulee City and the farmers of Grant County.

They are infringing upon our water rights. We support small businesses and small farmers.

Sincerely,

Genie Grish

Kurt Grish

01

COMMENT IE 23

3/18/03

Charles F. Dickinson
P.O. Box 1341
Soap Lake, Wa 98851

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street P.O. Box 815
Ephrata, WA 98832

பி. 1 ம :

As per our phone conversation today, I am writing this down.

The proposed Drawdown of Banks Lake, in August, would be a serious Determent to the population of Spiny Ray fish in the impoundment. August is the peak spawning season for a large number of this type of fish. These fish spawn near the shoreline where the water temperature does not fluctuate too much.

The last draw down, decimated the stock of these fish, and they are just now starting to recover.

The Trout I have been catching (in the three to five pound class) and the Walleye (over eighteen inches), as well as one or two 1 to five pound bass, have been full of fingerling Perch.

This year has been an exceptional spring for catching larger Trout, as there is plenty of feed.

I have been fishing for the last month, almost daily, and have fished with fishermen from all over the State, and it is the large number of large fish, ^{which} are drawing them here.

As a fisherman, who has spent numerous hours on this impoundment, I believe that keeping the water level stable at this time of year is very important. Enough water can be released from other Lakes on the ~~Pend~~ COLUMBIA RIVER SYSTEM, THE ⁵ [↑] ~~one~~ one, can pick up the slack if it is needed.

thank you for your time.

Charles F. Dickinson
Charles F. Dickinson

COMMENT IE 24

Jim Blanchard
Bureau of Reclamation
P.O. Box 815
Ephrata, Wash. 98823

April 10, 2003

Dear Sir,
In regards to the Banks Lake drawdown,
I am opposed to it.

Grant County needs all the water for the
crops and cattle, in the farming area.

To take the water from the farmers is
absolut foolishness.

This needs to be stopped Now! Now!

The government is supposed to be of the
people - by the people - for the people.

It is urgent that you Rescind the proposed
Banks Lake drawdown Now, 2003.

Thank You.

Sincerely,
Beth Dornai
253 W. Northshore Dr.
Moses Lake, Wash. 98837

01

COMMENT IE 25

Lourence C. Dormaier
253 W. Northshore Drive
Moses Lake, Washington 98837

04-09-03

Telephone: 509-765-6406

509-765-7443

0571

76 Bureau of Reclamation
Ephrata, WA 98837

Dear Sirs,

I am not in favor of any drawdown
of the Banks Lake.

01

Sincerely,
Lourence C. Dormaier

COMMENT IE 26

From: "BRIAN EVANS" <evans581@hotmail.com>
To: <jblanchard@pn.usbr.gov>
Date: Fri, Apr 11, 2003 12:08AM
Subject: Banks Lake drawdown

04/10/03

Mr. Blanchard,

I am writing in regards to the proposed Banks Lake drawdown. Sir, I would like to comment against any of the drawdowns proposed that would render the majority of boat launches inoperable. Too often it seems, the government sides with the vocal minority, who often are not affected by the outcome of the environmental issues they take up. For once, I would like to see the government side with the people who will inevitably face financial hardship in the event of a major drawdown during the tourist season in the areas surrounding Banks Lake. This is a small area, with a majority of income, for many businesses, coming during the months during which this drawdown would take place. I grew up in Coulee City, and am well aware of the number of tourists that Banks Lake draws every year, it is a huge boost to the local economy, providing jobs to many residents in the area. With small city governments hurting financially in the wake of I-695 and other tax limiting legislation, and an economy slowed in the wake of 9/11, an annual drawdown in the area, could be the proverbial "straw that breaks the camel's back". While I do feel the salmon need to be monitored to determine that their runs are not severely hampered, due to human caused problems, people should come before fish. Salmon runs naturally fluctuate, I have read, that in some areas, salmon runs have actually had record numbers in recent years, however, that is never widely broadcast, if it isn't a crisis, it isn't newsworthy. It just goes to show that God knew what he was doing when he created this great earth, and how limited man really is in his knowledge. You have the power to make a stand for the people in the Banks Lake area, the drawdown, though it would raise the Columbia a negligible amount, would render most of the boat launches, prime fishing areas, and swimming areas unusable on Banks Lake. Please don't buy into the notion that it "might" help the salmon, as the proponents say, they admit that they cannot say for sure. Well, I will tell you, that if the drawdown affects the areas the tourists frequent, it "WILL" hurt the local area. The hard working people who are at your mercy on this issue, already pay to help salmon in their electric bills. The P.U.D spends millions of their money on salmon issues every year, please don't take there livelihood for a fish. Thank you for your time and consideration of my thought on the issue.

Sincerely,
Brian S. Evans
11058 E. Nelson Rd.
Moses Lake, WA 98837

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<http://join.msn.com/?page=features/junkmail>

01

COMMENT IE 27

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Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

We are just a little town but we have worked hard here. We raise fish & accommodate tourist. Have invested a lot of money & time. The rug is being pulled out from under us. Our fish especially the perch will suffer & it will be some seasons before they come back. Mosquitoes will be a real problem for Coulee City. Please don't do this.

Harold Evans

Feel free to use back of form or attach a separate piece of paper.

*Box 515
Coulee City WA
99115-0515*

01

COMMENT IE 28

April 10, 2003

To: Jim Blanchard, Bureau of Reclamation, P.O. Box 815, Ephrata, Wa. 98823

FROM: Leslie Fanning, P.O. Box 38, Royal City, Wa. 99357

CC to: President George Bush, Rep. Doc Hastings, Columbia Basin Irrigation District, Columbia Basin Development League, Rep. Greg Walden

Subject: Proposed Drawdown of Banks Lake

Attached are the signatures of 120 registered voters from our small rural area opposed to the proposed drawdown of Banks Lake which feeds the Federal Bureau of Reclamation Columbia Basin Irrigation Project. This project was developed for the express purpose of controlling flood waters, providing clean hydro-power, providing recreation, and for irrigating the rich soils of the Columbia Basin. The net effect to wildlife has been way to the positive with birds, waterfowl, beaver, and even cougars way more prolific than even twenty years ago. The additional wetlands created by the irrigation are probably the cause of this increase in wildlife. And the salmon run in year 2001 was the greatest since 1938 when the Grant PUD began to record the runs. Clearly, the irrigation project is a vital part of this region, the state of Washington, and the source of food for the United States. With the current situation of terrorist threats against our nation, we clearly must never allow our country to become dependent upon other possibly rogue nations for our food supply.

01

There has been no hearing in the Royal City or Mattawa communities. We continue to demand that a hearing be held in this area. When it is scheduled, please notify each signature on our petition by mail of the time and place of the hearing at least seven days in advance. There is currently reintroduced legislation to require a scientific peer review process as a prerequisite for ESA (Endangered Species Act) decisions. This legislation stems from a similar cock-eyed decision to shut off irrigation water to nearly 1,200 farmers and ranchers in the Klamath Basin in order to protect several species of endangered fish. The decision was later examined by a panel of the National Academy of Sciences. They found that the order to shut off the water had "no sound scientific basis".

02

"NO SOUND SCIENTIFIC BASIS" ???! – for destroying the livelihoods of hundreds of farmers or for disrupting the local economy and community, which pushed many Oregonians into bankruptcy? The crisis in the Klamath Basin is proof of the toll levied on peoples' lives when decisions are made on the basis of questionable science. If this kind of subjective political decision making is made and follows a similar disaster economically, our OWN government is acting as terrorists in rural communities. We agree with Rep. Walden of Oregon when he says "the federal government owes this basic fairness (of scientific review) to rural America."

03

Flow augmentation is so far a waste of electrical ratepayer's assets. Enormous assets of the public are squandered with little or NO demonstrable results. Measurable benefits to salmon smolt are virtually non-existent. And the benefits that are claimed are in dispute.

NO DRAWDOWN OF BANKS LAKE!!!!!! \

Leslie A Fanning

March 12, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

04

1. The idea is theoretically supposed to help spawning salmon; however, statistics record that only once in 50 years would the effect actually have this effect.
2. The action WOULD DEFINITELY affect the recreational use of Banks Lake by leaving boat launches, and other attractions high and dry. Recreation is one of the primary focuses of the Columbia Basin Project and will definitely hurt those who use the lake for recreation and those who make a livelihood from recreation.
3. The draw down will also hurt the district's generating capacity at the hydropower plant at the south end of the lake.
4. There is a concern that the supply of irrigation water could be hampered in a scenario such as three years ago. Then, a fire knocked out some of the large pumps that draw water from behind Grand Coulee Dam into Banks Lake, which is then diverted through the project's system of canals and reservoirs. Since there have been late-season problems the last three years, this is a definite problem.
5. We will not stand idle as another example of sacrificing a rural community to the altar of Endangered Species Act goes forth. The Bureau of Reclamation cites the communities of Forks, Washington; Orofino, Idaho; and Klamath Falls, Oregon as examples of such sacrifice.
6. Comment Period has been extended to April 11, 2003. Petitions must be received by the April 11th date and sent to Jim Blanchard, Special Projects Officer, Ephrata Field Office, Bureau of Reclamation, Box 815, Ephrata, WA 98823 or fax # 509-754-0239.

Signature	Printed Name	Address	Telephone	E-mail
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<i>Katharina Friese</i>	Katharina Friese	2498 Rd S NE	(509) 765-4684	
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<i>Donk Friese</i>	Donk Friese	2498 Rd S NE	(509) 765-4684	
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<i>Concepcion Canselamora</i>	Concepcion Canselamora	P.O. Box 246	(509) 349-8543	
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<i>Jose Canselamora</i>	Jose Canselamora	P.O. Box 246	(509) 349-8543	
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<i>Osvaldo Prieto</i>	Osvaldo Prieto	P.O. Box 82	(509) 349-8850	
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<i>Kevin Bauer</i>	Kevin Bauer	713 Southview St	(509) 349-8850	
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<i>Luis Martinez</i>	Luis Martinez	P.O. Box 386	349-2749	
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<i>Elida Martinez</i>	Elida Martinez	P.O. Box 1001	(509) 349-0623	
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<i>Christina Escamilla</i>	Christina Escamilla	P.O. Box 1001	349-0471	
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<i>Bosie Suarez</i>	Bosie Suarez	P.O. Box 81	349-0623	
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<i>Richard Suarez</i>	Richard Suarez	P.O. Box 81	349-0623	
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<i>Eva Martinez</i>	Eva Martinez	P.O. Box 261	349-8080	
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<i>Sonia Orjuna</i>	Sonia Orjuna	P.O. Box 888	349-8247	
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<i>Rosalia Orjuna</i>	Rosalia Orjuna	Box 888	349-8247	
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Feb. 22, 2003

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Signature	Printed Name	Address	Telephone	E-mail
<i>Hallie Fanning</i>	Hallie Fanning	POB 344 Royal City	346-1906	hbfanning@comcast.net
<i>Earl Hays</i>	Earl Hays	POB 722 Royal City	346-2131	
<i>Dennis G. Smith</i>	Dennis G. Smith	12609 Adams Rd S.	346-2159	dsmith@earthlink.net
<i>Charles Hunt</i>	Charles Hunt	4092 Duane Ave. Lake	766-8465	
<i>Kerry Smith</i>	Kerry Smith	PO Box 328	346-2620	
<i>Vint Roper</i>	Vint Roper	Royal City	750-7213	
<i>Rick Mieracki</i>	Rick Mieracki	Royal City	346-2560	
<i>Norman Spragg</i>	Norman Spragg	11870 24th St. N. W.	346-9173	
<i>Holly Green</i>	Holly Green	3634 Rd 12 SE	346-1616	
<i>Peter Christensen</i>	Peter Christensen	26037 Rd 10 SW	Ha. Nawa	932-4475
<i>Delores J. Allen</i>	Delores J. Allen	201 N. 1st St.	Ore. WA	787-1251

BANKS LAKE DRAWDOWN

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Signature	Printed Name	Address	Telephone	E-mail
<i>Roger Scroggins</i>	Roger Scroggins	13950 Rd 15, W. Royal WA	346-2267	
<i>Daryl Chesterman</i>	DARYL CHESTERMAN	P.O. BOX 997, ROYAL, WA	346-9482	
<i>Richard Calhoun</i>	Richard Calhoun	10259 Dalen Rd. S. Royal City, WA	346-9206	
<i>Nic Scroggins</i>	Nic Scroggins	312 Grape Drive, W. WA	765-8321	
<i>Cindy C. Carter</i>	Cindy C. Carter	10402 Hwy 20th, R.C.	346-9323	
<i>Willis L. Miller</i>	Willis L. Miller	11618 Rd. A, SSW R.C. WA	346-1157	
<i>Paul Sparheit</i>	Paul Sparheit	1929 Hwy 262 E, Othello WA	346-2905	
<i>Pat Lee, Sr.</i>	PAT LEE, SR.	11901 Rd. A-2, W. Royal City, WA		
<i>Beverly Mickle</i>	Beverly Mickle	10376 Rd E, S.W. Royal City, WA	346-9383	

*****BANKS LAKE DRAWDOWN PETITION *****
FARMERS - FISHERMAN PLEASE TAKE NOTICE & SIGN

Feb. 22, 2003

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Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	MAKE JAMETT	PO Box 1178 Royal City	346-2359	MINNETT@atnet.net
<i>[Signature]</i>	Ernesta Dera	P.O. Box 875 Royal City	346-2495	
<i>[Signature]</i>	John Saret	PO Box 399 Royal City, WA	346-2086	
<i>[Signature]</i>	Harold Saret	PO Box 399 Royal City, WA	346-2336	
<i>[Signature]</i>	Rhonda Davis	3744 Hwy 26 E Othello, WA	99342	
<i>[Signature]</i>	BRAND DIXON	12223 Rd CSP Othello	346-9740	
<i>[Signature]</i>	HAROLD SABIN	PO Box 545 Royal City	346-2726	
<i>[Signature]</i>	Vint Roper	7549 Rd 12 Royal City	750-7213	
<i>[Signature]</i>	Shane Christensen	9891 Rd 12 SW Royal City		
<i>[Signature]</i>	Seth Davis	3744 Hwy 26 E Othello	546-2844	
<i>[Signature]</i>	Neville Upchurch	360 Christensen Rd Othello	346-237	
<i>[Signature]</i>	Richard Phelan	12400 Highway Rd 15 Royal City	346-9205	

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Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	DAINCRAVEN	P.O. 207	750-8946	
<i>[Signature]</i>	Rachel Perkins	POB 219	346-9769	
<i>[Signature]</i>	Bryce R. Gordie	14987 Rd 8.5 NW	787-4840	
<i>[Signature]</i>	Richard Bailey	14730 Rd 10.5 SW	346-2515	
<i>[Signature]</i>	Clyde Fisk	8115 Rd 9.3 SW	346-2794	
<i>[Signature]</i>	Robert Smith	2414 Yarns Rd. Orofino, ID	1-208-841-3333	
<i>[Signature]</i>	Kelly Callahan	6917 Hwy 26 W	Royal City WA 509-346-2686	
<i>[Signature]</i>	Royal City	P.O. Box 1441		
<i>[Signature]</i>	William Woods	13704 Dodson Rd	Royal	
<i>[Signature]</i>	LLOYD W SPARKS	PO Box 89 Royal City, WA		
<i>[Signature]</i>	Daniel M. Argo	13789 Rd. I SW	Royal City, WA	509-346-9762
<i>[Signature]</i>	Angie Argo	13789 Rd I SW	"	509-346-9762

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Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	Bob Frazier	Box 394 Royal City, 99357	346-1906	bobfrazier@amuse3lake.wa.com
<i>[Signature]</i>	Doug Fletcher	8331 Lakeside Rd NE	346-1226	
<i>[Signature]</i>	Kenneth S. Kallenberg	P.O. Box 626 RR	346-2375	Kallenberg@comcast.net
<i>[Signature]</i>	Anderson K. Vister	18232 Rd 6 SE Warden	346-7205	avister@transwestern.com
<i>[Signature]</i>	Debra Bergeson	12192 Rd. I SW	346-9444	
<i>[Signature]</i>	Laurie M. Belmont	P.O. Box 5 Royal City, WA	346-2574	lbelmont@stetnet.com
<i>[Signature]</i>	Muriel S. Stoker	Box 314 Royal City	346-2849	
<i>[Signature]</i>	William J. Stinson	13447 Rd. B SE Othello WA	99344	
<i>[Signature]</i>	Robert P. Joffe	8923 Rd 9 SW Royal City	99357	
<i>[Signature]</i>	Marilyn J. Foster	17201 Rd 11 SW Royal City	99357	
<i>[Signature]</i>	Elaine Hebdon	13679 Rd 14 SW Royal City	346-2609	

BANKS LAKE DRAWDOWN

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Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	Tim Mathis	14143 Rd 2.5 SW	346-9657	
<i>[Signature]</i>	Spiced Brown	6987 Hwy 26 W	346-1355	
<i>[Signature]</i>	Nathan Wilson	4978 Hwy 26 W	346-2418	
<i>[Signature]</i>	John Kleckner	767 Rd. SW	346-2548	
<i>[Signature]</i>	Bob Brown	346-2761	346-5567	Royal City
<i>[Signature]</i>	Tim Kelleher	PO Box 422	346-2305	
<i>[Signature]</i>	Sally L. Day	Box 291	346-2468	
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<i>[Signature]</i>	L.C. Quist	1422 C St SW	346-3609	—
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<i>[Signature]</i>	Paul Nelson	1422 C St SW	346-9661	—
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<i>[Signature]</i>	Dorothy Lee	11901 Rd 17 N	346-2322	—
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<i>[Signature]</i>	PAUL B. CRAIG	14691 17th St SW	346-2056	—
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<i>[Signature]</i>	GORDON D. FILLES	12234 RD 5 N RC	346-2679	—
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<i>[Signature]</i>	W. C. LEFLER	13318 Adams Rd S	346-2309	—
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<i>[Signature]</i>	Robert Kinder	10902 Grand Ave	766-9317	—
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<i>[Signature]</i>	Richard H. Fisher	12609 Adams Rd S	346-9305	—
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<i>[Signature]</i>	Kelly Welsh	12815 R.A. 5 SW	346-2305	—
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<i>[Signature]</i>	Andy Arada	207th Rd 21.3 SW	932-0744	—
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<i>[Signature]</i>	MIKE MATHEWS	12609 Adams Rd S	346-9417	—
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<i>[Signature]</i>	P.O. Box 519	Royal City	99357	—
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*****BANKS LAKE DRAWDOWN PETITION *****
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Signature	Printed Name	Address	Telephone	E-mail
<i>William Ellis</i>	William Ellis	1153 2nd Ave SE Royal City, WA	346-7999	
<i>Harry Carter</i>	Harry Carter	109 Daisy St	509-750-2146	(346-9226)
<i>Paul Craig</i>	PAUL CRAIG	1469 RD 9 SE	346-2056	
<i>John Fugitt</i>	John Fugitt	3254 Rol E NE	346-2056	
<i>Scott M. London</i>	Scott M. London	39 N Grape Dr	764-2493	764-9837
<i>Dennis Gail</i>	DENNIS GAIL	PO BOX 909 RC WA 99357	346-9421	
<i>Carole J. Craig</i>	Carole J. Craig	1469 RD 9 SE	509-346-2056	
<i>Stan Clark</i>	CLARK	12006 RDE Royal City	346-9240	
<i>Roy J. Davis</i>	Roy J. Davis	3744 Hwy 20E	346-2346	
<i>Daniel E. Williams</i>	DANIEL E. WILLIAMS	11978 Rd 14.5 S.W.	346-1880	
<i>Ed Spaulding</i>	Ed Spaulding	Royal City, WA		
<i>David Helgley</i>	DAVID HELGLEY	9534 RD 12.5 W, ROYAL CITY, WA	779-357	
<i>Donald D. Plam</i>	Donald D. Plam	8511 11th U. Royal City	700-7187	
<i>Sheila Verheij</i>	SHEILA VERHEIJ	1462 RD 10 SW	346-9257	
<i>Anita Sather</i>	Anita Sather	PO Box 128 RC	346-6698	

Banks Lake Drawdown
Final Environmental Impact Statement

Feb. 22, 2003

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	David W. Lewis	14501 Rd 1.5 S. E. Hawks	750-8644	
	Dan Decker	271 Valley View	Othello WA 989-124	
	Ben E. Smith	201 E. 8th Street	Othello WA 989-124	
	Larry Fisher	717 Highland Pl.	Moses Lake, WA 98837	
	Nelson Cox	7415 RD 2.5 S. E. Windmill	WA 98857	
	Douglas Berg	2962 Rd 1.5 S. E.	Warden WA 98857	
	Mark J. Olsen	8415 20th St. N.	Othello 509-448-2768	
	Doug Ryland	1511 E. 5th St.	Mosier WA 98941	
	John Lund	17027 R.R. SE	Warden WA 5	

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<i>Tanya Lee</i>	Tanya Lee	11028 Rd K SW RC.	346-2165	
<i>Debbie Gilhart</i>	Debbie Gilhart	15671 Rd B SE.	346-2580	
<i>Aleene Schuch</i>	ALENE SCHUCH	STRAFFORD		
<i>Clarence Schuch</i>	CLARENCE SCHUCH	STRAFFORD		
<i>Susan Gonzalez</i>	Susan Gonzalez	P.O. Box 425	Wah.	91857
<i>Octavio Vargas</i>	Octavio Vargas	30913 SE Royal City	509-346-2281	
<i>Loraine Snell</i>	LORAIN SNELL	10805 Rd 13 SW Royal City WA	509-346-2338	
<i>Laura Goroski</i>	Laura Goroski	7998 Rd B SW Royal City	346-4590	
<i>Linda Raser</i>	Linda Raser	P.O. Box 519 Royal City	346-2357	
<i>Lisa Renteria</i>	Lisa Renteria	P.O. Box 729 Royal City WA.	99357	

Feb. 22, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the **OPPOSED** position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

1. The idea is theoretically supposed to help spawning salmon; however, statistics record that only once in 50 years would the effect actually have this effect.
2. The action **WOULD DEFINITELY** affect the recreational use of Banks Lake by leaving boat launches, and other attractions high and dry. Recreation is one of the primary focuses of the Columbia Basin Project and will definitely hurt those who use the lake for recreation and those who make a livelihood from recreation.
3. The draw down will also hurt the district's generating capacity at the hydropower plant at the south end of the lake.
4. There is a concern that the supply of irrigation water could be hampered in a scenario such as three years ago. Then, a fire knocked out some of the large pumps that draw water from behind Grand Coulee Dam into Banks Lake, which is then diverted through the project's system of canals and reservoirs. Since there have been late-season problems the last three years, this is a definite problem.
5. We will not stand idle as another example of sacrificing a rural community to the altar of Endangered Species Act goes forth. The Bureau of Reclamation cites the communities of Porks, Washington; Orofino, Idaho; and Klamath Falls, Oregon as examples of such sacrifice.
6. There have been no hearing in the Royal City community and by our signature we are requesting a public hearing before the close of the public comment. If not possible by the March 10 date, then we demand an extension of the public hearing process. Inadequate time for studying the documents and making intelligent comment has been allowed.

Signature	Printed Name	Address	Telephone	E-mail
	Chad Smith	Quincy	(509) 787-3765	SSQ1@Comcast.net

COMMENT IE 29

MARCH 14, 03
ELECTRIC CITY WA.

Dear Sir:

I would like to make a few comments
Against The Draw Down of Banks Lake
This Summer. (2003)

I have lived in this area for 63 years
and have observed the negative effects
of lowering the water level in Banks.
during the summer and winter.

1st. IT HAS A NEGATIVE EFFECT ON THE SHORE
LINE ECOSYSTEM. CAUSING THE TREES AND
BRUSH ALONG THE SHORE LINES TO DIE. AFTER
WHICH IT TAKES A COUPLE OF YEARS TO COME
BACK. IT ALSO CAUSES THE SEAWEED TO
DIE TAKING AWAY THE AREAS UNDER WATER
WHERE SMALL FISH CAN HIDE. ALSO IT
DISRUPTS THE SPawning PROCESS OF THE FISH
CAUSING THE LOSS OF A WHOLE YEAR OF YOUNG
FISH. AFTER THE SHORE LINE AND LAKE
BOTTOM DRIES OUT YOU HAVE A PROBLEM WITH
BLOWING DUST & SMELLS FROM ROTTING VEGETATION
WINTER. THE DUCKS AND BIRDS THAT NEST ALONG
THE SHORE LINE ARE ALSO DISTURBED.

2nd The Amount of water that can be used
from the lake of a draw down of 10 FT
is only 10 DAYS WORTH OF WATER AT 1 FT
NEXT PAGE.

01

Draws Down A Day. This is NOT A Significant Amount of water when you consider that The Average Flow of The Columbia River in The Summer Time is Between 130,000 AND 120,000 Cubic FT A Second. During Flood Stage The Cu.FS can Run up to 450,000 CFS. I don't know what Time of year The SALMON migrate Down The Columbia. but would imagine it would Be during The Spring Run off.

3rd. I don't know The Figures of The Cost of Saving The SALMON. But From The Newspapers I would guess A Figure of \$200,000,000 A year. If you get A return of 1,000,000 SALMON IT Appears each. Fish cost \$200 A piece. 1 million SALMON is NOT even enough To give every person in The STATE of Washington 1 Fish a year. NOT COST EFFECTIVE

4th. When you draw Down BANKS LAKE 10 FT you lose Thousands of Fresh water Clams, Bugs, and other Things That Fish eat. It does NOT seem effective To Try To Save SALMON. By A Unplanned release of water AT A Prohibitive Cost To Another Ecological system which is AT Least AS important AS saving The SALMON. which Appears To Be on The rebound. According
next page.

To Reports in The News. & Fishing
Parachutes.

01

Engine Fuelers
PO Box 4161
Electric City WA 99123
Ph # 509-633-3255.

COMMENT IE 30

From: "Fitch, Rob" <RFitch@wvc.edu>
To: <jblanchard@pn.usbr.gov>
Date: Thu, Apr 10, 2003 10:31AM
Subject: banks lake

Dear Bureau of Reclamation,

I am deeply concerned about the plans of the Bureau of Reclamation to release a substantial amount of water from Banks Lake later in the summer. My family and I have enjoyed Banks Lake on camping trips in late August and early September over the past 5 years. We, and numerous other visitors to the area, would be greatly disturbed if the lake were lowered by this release.

In addition, the original purpose of Banks Lake was to provide a reservoir for irrigation of the Columbia basin to provide for agricultural growth of inland Washington state (we've seen the movies and read the information at the Grand Coulee dam numerous times during our frequent visits). We believe that the release of such a large volume of water during the planned drawdown would have a large negative impact on Eastern Washington's agricultural & recreational community. If anything, we should be doing all we can to bolster our agricultural & recreational community during these difficult economic times.

I work as a full-time Biology Instructor at Wenatchee Valley College. I am acutely aware of the crisis in the fruit industry in the Wenatchee Valley and throughout Eastern Washington. Please do not create another crisis in another branch of our agricultural community by the drawdown of water from Banks Lake.

Please, please, do NOT release the water from Banks Lake. My family and I strongly urge you to reconsider the Bureau's plans to drawdown the water in Banks Lake. The economic impact, both agriculturally and recreationally, will be significant.

Thank you for your time and interest.

Respectively,

Rob & Kathy Fitch

Rob & Kathy Fitch & family
933 Corbaley Place
Wenatchee, WA 98801
(509) 662-5589

01

COMMENT IE 31

From: "Tom Flint" <twflint@crcwnet.com>
To: <jblanchard@pn.usbr.gov>
Date: Fri, Apr 11, 2003 7:03AM
Subject: Opposed to Banks Lake Draw Down

Jim. I am opposed to the proposed Banks Lake Draw Down. This proposal is not based on sound science with no known benefits. It is also a misappropriation of water allocations as well.

01

Tom Flint
5842 Rd 2NW
Ephrata, WA
98823

509-787-2003

COMMENT IE 32

From: "Orie L. Francis" <orieo@bigdam.net>
To: <jblanchard@pn.usbr.gov>
Date: Sun, Apr 6, 2003 2:47PM
Subject: Banks Lake

I would like to take this opportunity to make some comments regarding Banks Lake.

We are Grant County taxpayers, that live in Electric City - on Banks Lake.

My opinion is that you should not draw down the lake - to allow more water to remain in the river to "help migrating salmon". Too much money has been spent trying to "save the wild salmon". No one can tell the difference between wild salmon and hatchery - that is why they clip the fin on the hatchery salmon. If the lake levels are down it will be necessary to modify the existing facilities - thus spending more taxpayer money.

Another comment I have regarding Banks Lake, which I have not seen anyone bring up - is --- I think the Bass fishermen should have to either wait until a respectable time in the morning to "roar out" or have their start area be out of town. They (sometimes more than 100 boats) roar through the town area at full throttle at 6:00 a.m. or earlier, which can be heard all over town - even with all of the windows closed. I think we have some sort of a noise ordinance in Electric City????

Sincerely

Myrna J. Francis

01

COMMENT IE 33

From: "Jeff" <jfred@gemsi.com>
To: <jblanchard@pn.usbr.gov>
Date: Sun, Apr 6, 2003 12:21PM
Subject: Banks Lake Drawdown

Jim Blanchard
Bureau of Reclamation
Dear Mr. Blanchard,

I saw in the Spokesman Review newspaper that some bass fishermen would like to see Banks Lake drawn down because it would improve willow growth. However, what kind of an impact would the drawdown have on aquatic plant life that is so vital to fishes and birds?

If I remember correctly, there was a major drawdown on Banks Lake about five to seven years ago that did some long-term damage to aquatic plants.

I know that the salmon and steelhead smolts in the Columbia River system need adequate flow to help them migrate to the ocean, however, is it possible that there is already enough flow, even without lowering Banks Lake?

Unusable boat launching facilities on Banks Lake would be bad for sportsmen and other boaters, and also bad for local businesses on and near the lake.

With the information I have at hand, I would have to say I am opposed to that drastic of a drawdown.

Have a good day.

Sincerely,

Jeff Frederick

Moses Lake, Washington

01

COMMENT IE 34

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

Why are we having this
Happen To our parks at the
Peak Time of Summer. When
our coulee city parks is
Doing its Best at this time
of year. So whats the
point, why do you have to
Drop the water in the summer
peak months We Need our
parks To Help the town

Feel free to use back of form or attach a separate piece of paper.

01

I Like To have my
Family go Swimming
an play at parks as well
as enjoying our Town

Mr Ken Furman
ADAMS Street 113
Candle City
Phone 632 8708

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COMMENT IE 35

From: "Glendon Gee" <glendongee@charter.net>
To: <jblanchard@pn.usbr.gov>
Date: Sat, Apr 12, 2003 7:13AM
Subject: water for agriculture

Please do not release 130,000 acre feet of water. A compromise should be reached that allows water to be stored in Banks Lake for later use by irrigated crops.

01

gwg

Glendon W. Gee
1637 Birch
Richland, Washington 99352

COMMENT IE 36

From: "Glendon Gee" <glendongee@charter.net>
To: <jblanchard@pn.usbr.gov>
Date: Mon, Mar 17, 2003 7:23PM
Subject: drawdown--prevent it

----- Original Message -----

From: Glendon Gee
To: Glendon Gee
Sent: Monday, March 17, 2003 6:22 PM
Subject: jblanchard@pn.usbr.gov

We are against any further or unnecessary draw down of the Banks Lake at this time.

01

Glendon and Shirley Gee
1637 Birch
Richland WA 99352

COMMENT IE 37

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of **August and September**.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

As the Highlighters Art Club Workshop & Gallery president, I am concerned for our Art Shop on Main Street in Coulee City. We depend on the tourists in the park to keep our little shop going. We get just as much traffic in Sept, as in Aug; as after school starts, the retirees are still on the road, enjoying the park, fishing & swimming. We share the whole community's anxiety over this deplorable situation. We hope you will consider the impact to all of us, & do the right thing for the people, over fish, as it should be.

Feel free to use back of form or attach a separate piece of paper.

Sincerely

Dorothy Graff, Coulee City, WA

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COMMENT IE 38

March 12, 2003

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
PO Box 815
Ephrata, WA 98823

Dear Mr. Blanchard:

I am opposed to the action alternative of the ten-foot drawdown of Banks Lake. I have reviewed the Draft Environmental Impact Statement, and take issue with several points.

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According to the Washington Department of Fish and Wildlife website 2002 Salmon returns are high, with an above average projection for 2003. In contrast, citizens whose own existence depends on the summer tourist revenue could be impacted to point of insolvency.

02

It is stated in the Draft Environmental Impact Statement that "impacts on the economy of Grant County are negligible." Where is the data to back this up? In averaging the impact at the county level, you minimize the impact not only on the number of individual small businesses that would be devastated by one season of less than average seasonal income, but also the loss of jobs and tax revenue so urgently needed in our rural area. Washington's small business climate is already foundering under increased regulations and a higher minimum wage than they can support. Save a few fish, and lose several business enterprises? The ripple effect of losing those businesses will be felt throughout the county. According to Washington State County 2001 Travel Impacts, eastern Washington employment directly generated by travel spending is 32.3% of the total jobs. Local tax revenues directly generated by travel spending are \$28 million, and state taxes of \$116 million. Grant County alone generates \$126.3 million from travel spending. Any loss of this hard-earned and cultivated income would certainly have more than a "negligible" effect on the county's citizens and funded programs.

It is further stated in the draft EIS that "recreational opportunities could be negatively affected when the lake level falls below 1,565 feet." Historic records show lower recreational use when water dropped below this level, but the Draft EIS suggests that this should not impact the local economy as "there are many close substitutes for recreation on Banks Lake." Recreational users may be able to choose other areas to use as destinations, but that leaves many established business entities such as Coulee City Community Park and Sunbanks Resort literally "high and dry," as they cannot transfer their operations to these "close substitutes." Coulee City especially, would suffer most in lost revenue, and like other small cities in eastern Washington, is already under severe economic strain for its continued existence.

Despite the statements in the draft EIS, I firmly believe that this action is detrimental to the health of our local economy. Would you consider the effect "negligible" if it was your business that had to close? I urge you to cancel this proposed drawdown.

Sincerely,



Maynard Hagen
PO Box 91
Soap Lake, WA 98851

COMMENT IE 39

Date: 4/6/03

To: Mr. Jim Blanchard

jblanchard@pn.usbr.gov

From: Terry Hastings

farm unit 76, block 253

29928 Rd M SW

Mattawa, WA 99349

Tlhastings@peoplepc.com

Re: Banks Lake drawdown for salmon migration

The Tri City Herald recently ran an article detailing a proposal to draw down Banks Lake in an attempt to flush salmon smolt down the Columbia River.

Flow augmentation has so far proven to be a colossal waste of electrical ratepayer's assets. It is a text book example of out of control environmentalism whereby enormous sums of public resources are squandered with little or no demonstrable results. Proven, measurable benefits to salmon smolt are virtually non-existent. Those benefits that are claimed are in dispute.

In the case of the Banks Lake drawdown proposal I would demand to know:

How many returning adult salmon will this proposal generate?

What is the cost of this proposal to the Banks Lake recreation & tourist trade?

What is the cost of this proposal in lost generation to the operation of the Columbia River hydro system?

What is the cost of this proposal to the various irrigation districts that depend upon Banks Lake water?

What are the political ramifications of allowing dubious environmental policies to dictate operation of the hydro system?

What is the overall calculated cost in dollars per returning adult salmon of this proposal?

My bet is that the answer to 6 above is going to easily run 5 to 6 figures per returning adult salmon. This is nuts. As an electrical ratepayer and taxpayer I demand that my money be spent in a prudent manner on sound environmental policies that have been demonstrated to work and be cost effective. Flow augmentation has proven to be the exact opposite: staggering cost with no provable benefits.

Best wishes,

tlh

Cc: smcdaniel@scbid.org

Gfanning@moseslake-wa.com

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COMMENT IE 40

04-08-03

Bureau of Reclamation
PO Box 815
Ephrata, Wa 98923

As an irrigated farmer in Bk 42, I am
opposed to the plan of additional draw-down
of Banks Lake this summer. The Lake is
an important part of our Columbia Basin Irrigation
System.

01

Jack Hendrix



COMMENT IE 41

March 19, 2003

Mr. Jim Blanchard
Bureau of Reclamation
PO Box 815
Ephrata, WA 98823

Dear Mr. Blanchard:

I am writing this letter to register my opposition to the action alternative of the ten-foot drawdown of Banks Lake. The risk to the area economy, and the whole of eastern Washington, is far greater than the benefit to salmon. Northwest electric ratepayers are already funding the most expensive salmon restoration program in the country, and there seems to be no end in sight. At the same time, reports of 2002 Salmon returns are high, and the projection for 2003 is above average.

01

I have read the Draft Environmental Impact Statement; it doesn't include any data regarding the severe economic losses the local economy and small businesses will surely feel. The area around Banks Lake supports many recreational businesses, and even a 10-foot drawdown will dramatically affect these seasonal businesses, as well as the many merchants and service industries throughout Grant County that also count on the seasonal tourist dollars.

The Draft EIS states that "impacts on the economy of Grant County are negligible," and minimizes the impact on the number of individual small businesses that would be devastated by one season of less than average summer income. It also doesn't take into account the loss of jobs and tax revenue that are essential for economic survival in our rural area. Washington's rural areas are already suffering due to the budget crisis with no help in sight. Save a few fish, and sound the death knell for local economies? The ripple effect of losing those businesses will be felt throughout the county and the state. According to Washington State County 2001 Travel Impacts, eastern Washington employment directly generated by travel spending is 32.3% of the total workforce. Local tax revenues directly generated by travel spending are \$28 million, and state taxes of \$116 million. Grant County alone generates \$126.3 million from travel spending. The loss of this seasonal income would certainly have more than a "negligible" effect on the county's citizens and businesses.

The Draft EIS mentions that "recreational opportunities could be negatively affected when the lake level falls below 1,565 feet," and arrogantly suggests that this should not impact the local economy as "there are many close substitutes for recreation on Banks Lake." Recreational users may be able to choose other areas to use as destinations, unlike the established business that will see their seasonal tourist income pass them by as recreational users choose these other areas. The effect on the business community of Coulee City especially will suffer because of the lost revenue, and our small rural cities are already scrambling for any revenue they can.

Despite the statements in the draft EIS, I strongly believe that this action is detrimental to the health of our local economy. It will take years to restore salmon runs, as it has taken years of over-harvesting to cause them to decline. This is not the answer.

Sincerely,



Ken Holm
PO Box 387
Ephrata, WA 98823

COMMENT IE 42

From: "Carole" <hopkins1@atnet.net>
To: <jblanchard@pn.usbr.gov>
Date: Tue, Mar 11, 2003 7:38AM
Subject: Do not lower Banks Lake!!!!

Mr. Blanchard, I am writing in concern about the thought of lowering Banks Lake!!! This is a terrible mistake to even consider this idea. When people consider changing or ruining peoples livelihood to help FISH is a big mistake. We know people who need the money coming into that area and this would hurt them intensely. Plus as a tourist who comes to the Banks Lake many times feel this is a terrible idea. Please re-think this. I know there are many other ideas to try to save the FISH!!

Thank you for your time.

Carole Hopkins
2021 Melody Ln
Moses Lake WA 98837

01

COMMENT IE 43

From: "fritz" <fahowar7@moseslake-wa.com>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Apr 9, 2003 11:02PM
Subject: banks lake drawdown

01

I have read much information on the proposed drawdown of banks lake and find some similarities to the klamath falls disaster (both to the farmers there and to the public image of many involved agencies).

to keep this short, i'll give a short history and make two points.

i am a retired sergeant with the grant county sheriff's office. during my 28 years patrolling grant county i made innumerable contacts with local residents and visitors from out of county. one of my duties was operating and supervising the boat patrol for g.c.s.o.

In my estimation, the premier lake in grant county (including the col. river) is banks lake when viewed for its clean water, excellent fishing, availability to the public for on water recreation of all kinds and size to allow for the very large out of county response by boaters. this lake is my personal favorite (my family and many friends stay at the coulee city park and enjoy boating and fishing).

second, i now farm 13 acres just east of soap lake with 10 of the acres irrigated by u.s.b.r. water. i raise grass/alfalfa (some for sale), 2 horses and will add cattle this year. without that water my place will die, the livestock will be sold, etc. etc.

for these two reasons i find the proposal without merit and to be most destructive to the tourism industry along banks lake, also possibly highly destructive to agriculture in all of grant county and adjacent counties supplied by u.s.b.r. water from banks lake.

in one article i noted that there is no scientific proof that this additional water will aid the fish to reach the sea and further noted that the major down stream movement of the fish occurred before the proposed drawdown / higher stream flow.

the proposal lacks any sort of common sense / believability, threatens returning grant county to a desert and makes me highly suspicious of the motives behind such a move.

question- are these continued attacks on water usage all about control and power and have little to do with endangered species ????????

i wonder.

thank you for your time.

fred "fritz" howard
pob 1389
soap lake, wa 98851
246-1037

COMMENT IE 44

Mr James Blanchard-Manager
Special Projects Officer
Bureau of Reclamation
POB 815
Ephrata, WA 98823

April 9, 2003

Dear Sir,

Please record this letter in Opposition to the Banks Lake Drawdown

We need additional time to study the draft EIS.

This drawdown flies in the face of common sense. It will devastate tourism and the local businesses. It will make boating, fishing, and swimming impossible. Mosquitoes will breed in the mud flats and create a health hazard for people and birds.

Your agency needs to re-think what it is doing, and rewrite the draft EIS and address these issues.

Sincerely,



Jack Jenkins
POB 782
Soap Lake, WA 98851

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COMMENT IE 45

From: "karenjo@johnlscott.com" <karenjo@johnlscott.com>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Apr 9, 2003 9:29PM
Subject: Response to Newspaper Ad

Please accept my public comment in support of the statement/thoughts of the Washington State Potato Commission regarding the water release/water use as presented in the recent newspaper advertisement.

01

Karen Jones
3202 South Jefferson Street
Spokane, WA 99203

COMMENT IE 46

4:

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of **August and September**.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

I cannot see what environmental purpose you can get from such a draw down. I can see what a draw down would do to the lake, the fish, the recreational project, & the economy. Would the fish survive? the reproduction of the fish? Recreation would be at a standstill. It would affect all the towns around this year & many years to come. Coulee City depends a lot on

01

Feel free to use back of form or attach a separate piece of paper.

recreation to keep our town afloat.
What would the children do for swimming
and picnicing. Parents the mud
that will be left from this draw down.
Environment Impact! What impact but
to hurt all of those who depend on
this lake for a lively hood.

V. Joyce Jones
PO Box 507
Conlee City, 99115

01

COMMENT IE 47

From: "Greg Kardong" <kjee2@earthlink.net>
To: <jblanchard@pn.usbr.gov>
Date: Mon, Mar 24, 2003 9:21AM
Subject: AGAINST BANKS LAKE DRAWDOWN

Jim,

Place my name in the "DON'T" column. Banks Lake is one of the few nearby "gem lakes" great for water sports and camping. It's truly one of the major reasons I and all my friends really enjoy living in this area. We look forward to each summer with the vision of boating, snorkeling, camping etc @ the north end. The drawdown would be a real lasting kick in the gut.

01

Greg Kardong
4915 Bluff Drive
Moses Lake, WA 98837

kjee2@earthlink.net

COMMENT IE 48

From: "Jesse" <jdknopp@centurytel.net>
To: <jblanchard@pn.usbr.gov>
Date: Thu, Mar 20, 2003 10:05AM
Subject: Banks Lake draw down:

Mr. Blanchard,

Please don't allow the draw down of Banks Lake in Aug. This is about the only activity the children of Coulee City has in the summer time. My grandchildren and I spend a lot of time at the lake in the summer as we all enjoy swimming and picnicking. I live 4 blocks from the lake so I spend special time there.

The tourist that use the lake also bring a lot of revenue to the towns around the lake.

Please don't lower the water level of Banks Lake.

Dolores Knopp

01

COMMENT IE 49

From: "Gary L. Christensen" <gchriste@bentonrea.com>
To: "Jim Blanchard" <jblanchard@pn.usbr.gov>
Date: Thu, Apr 10, 2003 11:09PM
Subject: Banks Lake Drawdown

Mr. Blanchard:

I am deeply disturbed regarding even considering the drawing down of Banks Lake for the "probability of meeting flow objectives". There is no scientific data to support such conclusions.

This is a dangerous precedent which threatens the agricultural viability in the Columbia Basin. Tourism and recreation will also be deeply affected by this action. Banks Lake was developed to act as a reservoir to sustain the irrigation projects in which it serves. Don't mess with the original intent and purpose of this mass of water which serves numerous purposes to the people of the Columbia Basin.

Gary L. Christensen
L & G Christensen Farms, Inc.
10542 Road Division South
Othello, WA 99344

509-346-2697

01

COMMENT IE 50

From: "Lake Farms" <jlake@ronan.net>
To: <jblanchard@pn.usbr.gov>
Date: Fri, Apr 11, 2003 2:06PM
Subject: Lake Drawdown

To whom it may concern:

We depend on potato seed sales to Washington for our livelihood. Please consider the economic effect this may have on ag and all ag business before making this decision to turn loose this water.

01

Susan Lake
50093 Hyw 93
Ronan, Montana 59864

COMMENT IE 51



ConAgra Foods Foodservice Company
Specialty Potato Products
 Administrative Office
 8701 West Gage Blvd.
 P.O. Box 6, 1900
 111 Cities, WA 99301-1900

TEL: 509 735-4634
 FAX: 509 735-0309

April 11, 2003

Mr. Jim Blanchard
 Ephrata Field Office
 U.S. Bureau of Reclamation
 Box 815
 Ephrata, WA 98823

Mr. John Keys
 Commissioner, USBR
 1849 C St. NW
 Washington, D.C. 20240-0001

RE: **LAMB-WESTON, INC. COMMENTS CONCERNING USBR'S BANKS LAKE
 DRAWDOWN PROPOSAL AND DRAFT ENVIRONMENTAL IMPACT
 STATEMENT**

Dear Mr. Blanchard and Commissioner Keys:

This letter is offered by Lamb-Weston, Inc. concerning the United States Bureau of Reclamation's (USBR) proposal to draw down Banks Lake in the Columbia Basin of Washington State.

Lamb-Weston is the largest producer of processed potato products in the United States. Lamb-Weston has 6 processing facilities in Washington and Oregon, employing approximately 5,000 people. Our facilities are dependent upon some 6-8 billion pounds of raw potatoes annually, the majority of which are grown in the Columbia Basin, the area that will be most impacted by the proposed Banks Lake draw down.

In the agricultural industry in Eastern Washington, Lamb-Weston occupies a unique niche. Lamb-Weston not only processes potatoes into value added product, but also acts as a grower of its raw potato needs, as well as being a purchaser of raw potatoes from independent farmers. As a grower, Lamb-Weston farms through joint venture and custom farming agreements. As a purchaser, Lamb-Weston contracts with several hundred farmers for the remainder of our raw potatoes.

Currently the financial health of the Washington potato industry is precarious. During the past five years, selling prices for potatoes have been very low, margins are tight, credit is scarce, and losses are mounting for many Washington potato farmers. Potential shortages of water and/or restrictions on irrigation, which could result from the USBR's proposal to draw down Banks Lake, are of particular concern to both the potato growers of Washington State and the

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Lamb Weston



ConAgra Foods Foodservice Company
Specialty Potato Products
Administrative Office
8701 West Cagle Blvd.
P.O. Box C-1900
Irra-Cum, WA 99101-1900

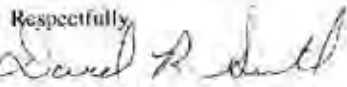
TEL: 509-735-4651
FAX: 509-736-0399

processors who's business supports many of these growers. The USBR's proposal could have a devastating impact to the entire Washington potato industry.

Based on our review of the USBR's proposed action alternative and Draft EIS for the Banks Lake draw down, Lamb-Weston opposes both ("No Action" and "Action") alternatives presented. Lamb-Weston urges the USBR to maintain its historic operations of the project—for the August period—with Banks Lake reservoir operations predominantly held within the 1567-1569 ft. elevations.

Lamb-Weston concludes that the USBR proposed draw down actions ("No Action" and "Action" alternatives) would have no positive measurable impacts to the survival of migrating juvenile Columbia River salmon; and they would give false credence to the technically flawed flow targets currently within the NMFS 2000 BiOp. Conversely, such actions would negatively affect native or local ecological habitat and resources, could negatively affect on-site recreation resources and possibly hydropower production, and unlawfully encroach upon the statutory authorization for the project. The benefits are either very unclear or nonexistent, while the costs are apparent.

Lamb-Weston believes that the draw down proposals are ill-conceived measures that should receive no further review or action, and urges that historical operating regimes at the Banks Lake Project be maintained. Lamb-Weston, Inc. is a member of the Washington State Potato Commission and works closely with its leadership. Lamb-Weston has reviewed in detail the comments made by the WSPC and we endorse the conclusions reached by the WSPC, and strongly urge the USBR to act according to the recommendations made by the WSPC.

Respectfully,

David Smith
Director of North America Agricultural Services
Lamb-Weston, Inc.

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LambWeston

COMMENT IE 52

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

The Banks Lake drawdown will not only affect our community and family recreation this summer, but it will have a devastating affect for our business. We depend on tourist trade for our livelihood.

Larry's Auto & Marine Supply
Coulee City, WA
Dan & Kathy Sanderlin

Feel free to use back of form or attach a separate piece of paper.

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COMMENT IE 53

From: Larsen Family <mh.larsen@verizon.net>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Apr 9, 2003 10:28PM
Subject: Banks Lake Draw Down

To whom it may concern:

IT is distressing that each year it seems we want to sacrifice our economy for fish. I know we have had record salmon runs the last few years. Please do not drawdown water for fish from Banks Lake.

01

The fish don't need it.

Mark Larsen
2415 Whitworth Ave
Richland, WA 99352

Mark
mh.larsen@verizon.net (home)
mlarsen@agrinw.com (work)

COMMENT IE 54

April 9, 2003

Bureau of Reclamation
PO Box 815
Ephrata, WA 98823

Good Morning,

We are asking that the bureau
not draw down Banks Lake.

This state cannot afford any
further economic hardship & we
believe this will cause one for
the potato farmers in the Columbia
Basin, along with other farmers
in the area.

If this is done for salmon, why did
the Columbia River & tributaries
have record salmon runs?

Thank you,
Kathy & Mark Lewis
PO Box 4765
Wenatchee WA 98807

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COMMENT IE 55

From: Paul Lindholdt <plindholdt@mail.ewu.edu>
To: <jblanchard@pn.usbr.gov>
Date: Sun, Apr 13, 2003 12:14PM
Subject: Banks Lake Comments

Thanks for this opportunity to comment on the proposed drawdown of BanksLake.

I support the drawdown, and I write to you as a longtime resident of Eastern Washington who fishes, hunts, camps, and otherwise recreates with my family in the region. The loss of the salmon must be stopped, and this effort is worth a try.

Moreover, I am very concerned about the growing power of the farm lobby, particularly the Washington State Potato Commission, which took out a full-page ad in the Spokane daily newspaper last week. That ad, without ever mentioning fish, urged readers to lobby you.

If money and subterfuge like theirs can affect public policy, then our democracy is in sad shape.

--

Dr. Paul Lindholdt
plindholdt@mail.ewu.edu
509 / 359-2812
<http://www.ewu.edu/cal/engl/plindholdt/home.html>

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COMMENT IE 56

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

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Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

For lack of funding, a number
of State parks that we enjoy on
"The Eastside" are being closed,
especially in the Columbia Basin area.
The proposed Drawdown will not only
adversely affect the recreational
facilities, but also, the fragile
economy of the rural communities.
The concern being: Will the Drawdown
just be another nail into the coffin?

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Feel free to use back of form or attach a separate piece of paper.

Larry + Sharon Lobe
Lind, Wa. 99341

COMMENT IE 57

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

3/22/03
Do we continually have to try and
fix everything just because someone or
some group makes a lot of noise?

I wonder? There is no doubt that
the draw down of Banks Lake will cause
a lot of hardship on business around the
Lake (north end + south end) and in some
cases, even bank rupee. From there on, it's
a snow ball effect that touches everything + every-
one. Again, I wonder? Especially hard to
understand is "why" after record runs of
the sacred salmon in the past 2 years.

Again, I wonder? If E. Mc Donald
P.S. Maybe it's really not bad at all?

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3/22/02

Jim Blanchard
 Special Projects Office
 Bureau of Reclamation
 Rose M. Blanchard

Is someone trying to fix something that isn't broken? In light of the record salmon runs the past couple of years. I wonder?

The people from all over the state who have used Banks Lake for years, depend the lake having adequate water in it for their boat launching and all related recreational activities, will have to find other vacation locations.

That means the business that provides ^{these people} goods and services in the Coeur d'Alene and Grand Coeur areas are going to suffer and hardships, many beyond their ability to stay in business. The snow ball effect is then set in motion. It will be devastating to all our small communities, even reaching our schools and the top base for Shoshone County.

I wonder if such a drastic measure is absolutely necessary to fix something that may really need it?

I hope that a remedy that isn't quite as painful as the Banks Lake draw down can be found that will get the job done.

Thanks for your consideration.

Respectfully yours,

H. E. McDonald
 P.O. Box 685
 Coeur d'Alene, WA 99115

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COMMENT IE 58

From: "Esther" <gentle@bossig.com>
To: <jblanchard@pn.usbr.gov>
Date: Mon, Mar 17, 2003 10:18PM
Subject: water drawdown

In the middle of a bad drought, farmers need water to produce the food you like to eat & have money enough to buy gas VIA the tax money generated, etc. And you want to throw away water?

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1. The problem began about 20 - 25 years ago when the Japanese and Russian fish trawlers were trawler-netting all the baby salmon off the Pacific shores. We used to go to Otter Rock, Oregon to have Christmas. At night you could watch the ships lights go up and down where that under water ridge is, where the baby salmon feed, to grow up. It is (so I'm told) in International waters. They took a whole lot of fish out of the ocean.
2. Due to the over-fishing cited above, the fishery industry of the Oregon ports dropped off rapidly. My husband liked to go fishing, and annually the guys who were stationery-office supply friends would gather for a day or two fishing. THAT stopped because the "salmon season" was only open for a day, maybe two.
3. Now we get engineers who want to destroy the dams, and thereby have a job. No one remembers the horrible Vanport flood, and all the other floods that happened -- which the dams stopped the annual billions of dollars (not counting the misery) spent to replace at least some of the flood damaged problems (sometimes it was a bridge or a few bridges that needed repair/replacement).
4. Who is going to baby sit the baby salmon nursery which is in the International waters?
5. In a drought, where are you going to get water for the farmers to grow food with? In a drought, where are you going to get the hay and other feed to grow your steaks and hamburgers?
6. You went to college and learned calculus, and forgot to learn common sense --- right?

Esther McM.

CC: <swentworth@cbnn.net>

COMMENT IE 59

From: "Dale Marohl" <gomez@odessaoffice.com>
To: <jblanchard@pn.usbr.gov>
Date: Tue, Apr 8, 2003 1:34PM
Subject: Banks Lake drawdown

It is apparent that lowering the water levels in Banks Lake will affect tens of thousands of lives in an adverse way in Grant county. It certainly was not the intent of our fore fathers to have this happen. We are sternly opposed to this decision and think it would be a financial disaster for our county.

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Thank You
Dale & Cheryl Marohl
PO Box 862
Coulee City, Wa.
99115

COMMENT IE 60

Faye Maslen

719 W. Loop Drive
Moses Lake, WA 98837
509-765-4839

BUREAU OF RECLAMATION
P.O. BOX 815
EPHRATA, WASHINGTON 98823

APRIL 9, 2003

TO WHOM IT MAY CONCERN:

I AM STRONGLY OPPOSED TO THE BUREAU OF RECLAMATIONS PLAN TO RELEASE 130,000 ACRE FEET OF WATER INTO THE COLUMBIA RIVER FOR ANY REASON. WE, THE PEOPLE OF THIS COLUMBIA BASIN NEED THAT WATER.

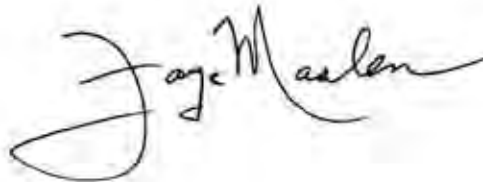
I'M SICK AND TIRED OF THE FISH HAVING MORE RIGHTS THAN THE PEOPLE HAVE. AND I WANT IT STOPPED.

THAT WATER IS NEEDED TO IRRIGATE THE CROPS IN THIS AREA. RELEASING ALL THAT WATER WOULD HAVE A MAJOR IMPACT ON THE IRRIGATION OF THE AREA. OUR CROPS WILL DRY UP, AND THIS LUSH GREEN FARM LAND WILL ONCE AGAIN BECOME A DESERT WASTE LAND.

DO NOT WASTE THIS WATER! THERE ARE PLENTY OF SALMON. YOU CAN GO INTO ANY SUPER MARKET AND PURCHASE ANY TIME, OR GO TO ANY RESTAURANT ANYTIME, AND ORDER SALMON.

WE ARE ABLE TO RAISE ALL THE SALMON NEEDED. DON'T WASTE THIS WATER BY RELEASING IT INTO THE RIVER.

FAYE MASLEN
719 W. LOOP DRIVE
MOSES LAKE, WA. 98837



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COMMENT IE 61

From: "JIM&IRENE" <mathewsJames@email.msn.com>
To: <jblanchard@pn.usbr.gov>
Date: Tue, Mar 18, 2003 6:02PM
Subject: Drawdown Proposal

I am opposed to the proposed drawdown.

01

Jim Mathews

COMMENT IE 62

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

We have been coming to Banks Lake with our motor home for many years. We love to fish and Banks Lake is a very nice and special place. Coulee City is a friendly and clean town. We feel that we want to continue to support this area. We will be very disappointed if we can no longer come here!!

Jessie Michel Box 324
Liberty Michel Pothello, Wa. 99344

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Feel free to use back of form or attach a separate piece of paper.

COMMENT IE 63

From: "Hubert P. Mills" <hpmills@icehouse.net>
To: <jblanchard@pn.usbr.gov>
Date: Tue, Apr 8, 2003 12:51PM
Subject: Draw down of Banks Lake

Director, U. S. Bureau of Reclamation:

Please reconsider the decision to release the 130,000 acre feet of water from Banks Lake into the Columbia. The water is desperately needed by the farmers, particularly those that are producing potatoes for commercial processing. The economy would be terribly hurt if a normal year of potato production is hampered in any way. The economy is in a poor shape now, and the withdrawal of water would be the proverbial nail in the coffin. Please reconsider-- let's not have a Klamath Lake incident here in the Columbia Basin. Sincerely, Dr. Hubert P. Mills, Retired Professor of Management, EWU, Cheney. Wa.

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COMMENT IE 64

Robert N. & Gudru Mosher
5540 Martin Road N.W.
Ephrata, Wa 98823

March 20, 2003.

Bureau of Reclamation
Attention: Jim Blanchard, Special Projects
P.O. Box 815
32 C Street N.W.
Ephrata, Wa 98823

Dear Mr. Blanchard,

We are writing to you to express our opinion on the proposed draw down of Banks Lake.

We know you had a sail boat there yourself so some of what we say must be familiar to you.

This will be the beginning of our fourth year we will be mooring our boat at Coulee City. Last April we bought a very expensive sport boat because of the ability to moor at Coulee City and the countless hours my wife and I, other family and our friends spend at the lake. We camp at the park even though we live in Ephrata. It is an excellent place to bring our grandchildren. They enjoy going out in the middle of the lake and playing off the back of the boat. They can do this for hours, while learning to swim. We also have family that live out of the area that come in the summer time to go skiing and boating. Often during the evenings we will take friends to the lake for skiing and boating and picnics. All of this, without a doubt, is the focal point of our summer recreation. We do not take extended vacations and go anywhere else.

As you can see, Banks Lake has become the traditional place in our family's lives for spending time together.

We can't imagine why the proposed draw down is even considered when the impact to people that use the lake is going to be so devastating and the benefit of doing so is so insignificant.

In addition, the economic impact to our area is staggering and will continue to have an impact for years to come.

Please consider people's needs for a place so beautiful as Banks Lake when deciding whether or not to go forward with the proposed draw down.

Sincerely,



Robert N. & Gudru Mosher

cc: Senator Patty Murray
Senator Maria Cantwell
Congressman Doc Hastings

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COMMENT IE 65

BUREAU OF RECLAMATION
P.O. BOX 815
EPHRATA, WASHINGTON 98843

APRIL 9, 2003

TO WHOM IT MAY CONCERN:

I AM STRONGLY OPPOSED TO THE BUREAU OF RECLAMATIONS PLAN TO RELEASE 130,000 ACRE FEET OF WATER INTO THE COLUMBIA RIVER FOR ANY REASON. WE, THE PEOPLE OF THIS COLUMBIA BASIN NEED THAT WATER.

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I'M SICK AND TIRED OF THE FISH HAVING MORE RIGHTS THAN THE PEOPLE HAVE, AND I WANT IT STOPPED.

THAT WATER IS NEEDED TO IRRIGATE THE CROPS IN THIS AREA. RELEASING ALL THAT WATER WOULD HAVE A MAJOR IMPACT ON THE IRRIGATION OF THE AREA. OUR CROPS WILL DRY UP, AND THIS LUSH GREEN FARM LAND WILL ONCE AGAIN BECOME A DESERT WASTE LAND.

02

DO NOT WASTE THIS WATER! THERE ARE PLENTY OF SALMON. YOU CAN GO INTO ANY SUPER MARKET AND PURCHASE ANY TIME, OR GO TO ANY RESTAURANT ANYTIME, AND ORDER SALMON.

03

WE ARE ABLE TO RAISE ALL THE SALMON NEEDED. DON'T WASTE THIS WATER BY RELEASING IT INTO THE RIVER.

Sincerely,
Sherry L Murray
1538 N. Mary St
Moses Lake, WA 98837

COMMENT IE 66

From: "Jean Nicholson" <ajn@bigdam.net>
To: <jblanchard@pn.usbr.gov>
Date: Wed, Apr 2, 2003 10:50AM
Subject: drawdown of Banks Lake

I strongly object to the drawdown of Banks Lake as do all of us in the Grand Coulee Dam area. It will hurt the local fish, the fishing season, the tourists, and above all, the farmers. This lake was put in for irrigation purposes, but has become a fishing paradise. If you do this for the lousy salmon that not many people even like to eat, what else can the National Marine Fisheries Service demand?

They almost ruined the Klamath Falls area a couple of years ago by drawdowns and at Conconnully four years ago, the lake has still not recovered.

Jean Nicholson

new email: ajn@bigdam.net

01

COMMENT IE 67

From: "THE O'SHEA'S" <boshea@qosi.net>
To: <jblanchard@pn.usbr.gov>
Date: Fri, Mar 14, 2003 8:48AM
Subject: comment on D.E.I.S.

Dr. Mr. Blanchard,

After reviewing much of the DEIS I have concluded that because of the length of time it took to prepare such an immense study, we have had over 2 years to witness a salmon run recovery that is far beyond what anyone can explain. To go ahead with lowering the pool of Banks Lake for the sole purpose of increased flows for E.S.A. listed salmonoid stocks when the RETURNING salmon numbers are at record levels since the building of the dams seems unwarranted considering all of the negative impacts to local wildlife and habitat as well as citizens who depend on boat launches and water at levels to maintain fish and other wildlife habitat on Banks Lake. If there was a process to DELIST a species from E.S.A. there may may not need to be a review of this well put together, very expensive I'm sure, report at all.

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Sincerely,

Brian O'Shea

4556 Rd. R N.W.

Quincy, WA.

CC: <jblanchard@pn.usbr.gov>

COMMENT IE 68

From: <Mikeypal@aol.com>
To: <jblanchard@pn.usbr.gov>
Date: Thu, Jan 16, 2003 2:17PM
Subject: (no subject)

Dear Mr. Blanchard

Response to DEIS for the drawdown of Banks Lake.

This document needs to be redrafted to reflect an unbiased evaluation of the proposed action. The section on the "Affected Environment" discusses the importance of the shoreline and aquatic habitat to fish and wildlife and their reliance on water to exist yet the "Environmental Consequences" section states that the habitat can withstand 40 days of dehydration (page 4-43). On page 4-45 under "Unavoidable Adverse Impacts" the statement "Minor changes in littoral and riparian communities may occur." there is simply no data in the DEIS to support conclusion

The environmental consequences section outlines the effect of a ten foot drawdown but the stated purpose of the EIS is to analyze the environmental impacts of a five foot one. The reality is the whole document should describe the existing condition (pool level 1568 -1570) to the proposal of 1570 to 1560.

The document omits an analysis of black crappie or sunfish or the fresh water clams. During the 1994 drawdown there were dead clams in the exposed area of Steamboat Rock State Park. What about the effectiveness of a drawdown on milfoil control?

The recreation section needs to discuss the shift of people away from the times of low water to high. Right now the state park can barely keep up with the solid waste, imagine the waste piles in July with people moving their vacations from August to July. The action alternative really cuts the summer recreation season by 50%. And the USBRs lack of a firm commitment to fund mitigation leaves July the only vacation time. Your mailing list shows you haven't reached the west side users. That will come back to bite. My vacation at the state park is Aug 9-19. If the water level is below 1565 then I will go in July and camp on the shore and parks will be out my camping fee.

Numerous places in the DEIS the benefits to salmon are used to support the action alternative you need to either omit the statements or support them. I think if information in the Hydrologic Report in Appendix C is evaluated it will be hard to support the benefits to salmon.

CC: <brit461@ecy.wa.gov>

From: <Mikeypal@aol.com>
To: <jblanchard@pn.usbr.gov>
Date: Mon, Feb 3, 2003 3:02PM
Subject: Re: (no subject)

Sorry about that ! Name is Mike Palko address is 2905 Angus Drive Tenino, Wa 98589 The cc of my comments went to Barb Ritchie at the Wash Dept of Ecology who will coordinate the comments on behave of the State of Wash.
If you have any questions re. my comments please e-mail me.

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COMMENT IE 69

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C St NW
Ephrata, WA 98823

4/7/2003

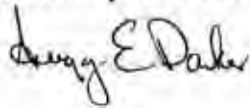
Dear Jim:

This is in support of the proposed draw down of Banks Lake. We have a critical salmon problem that can only be solved by having people step-up and help. In some cases helping will involve giving something up. In this case, it appears that what will be given up is very minor.

I have enjoyed Banks Lake for the 20 years I have lived in Grant County. I usually spend 20-30 days a year, fishing, duck hunting or just boating on the lake. If I am inconvenienced for a month or so a year-I will consider that my small contribution to helping us restore salmon runs.

Thanks for the opportunity to comment. Thanks for taking on jobs like this. Thanks for trying to do the right thing.

Gregory Parker
32736 Lakeshore Dr
Coulee City, WA 99115



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COMMENT IE 70

April 7, 53

Mr. and Mrs. Richard

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People say I am a very nice reasonable man, so I feel free to write this letter knowing it will be read, considered (and) with fairness and objectivity. It concerns the lowering of the level of Banks Lake. Please please, be extremely careful to consider a more reasonable approach to the level of Banks Lake. Since no one I have talked to can see anything reasonable about reducing the level to that extent, and it would seem to accomplish so little for the costs it would seem to achieve, it all seems counter productive. It would indeed accomplish destroying life time efforts and investments of individuals, towns, cities, and areas. It seems as if it would be devastating.

I do hope all people concerned will carefully consider with much moderation and balance before their final decision. Real long term good should be the approach and I hope this will be diligently sought.

Respectfully yours,
Clarence M. Payer
a resident for many years of the area
Box 555 Bendable, W. Va. 26025

COMMENT IE 71

The USBR and the National Marine Fisheries are proposing a 10-foot drawdown of Banks Lake during the months of August and September. This would prevent the use of the boat launches, bank fishing, and the swimming area. Besides the economic impact this will create, how does this affect YOU personally?

**HOW MUCH DOES BANKS LAKE MEAN TO YOU?
WHAT ARE YOUR SUMMER CUSTOMS AND HABITS?**

1. How many times each week do you and your family use Banks Lake during the months of August and September? 8

Total for two months 16

2. How many times each week do you and your family use the swimming area at the Coulee City Park during the months of August and September?

Total for two months 12

3. How many times a week do you launch your boat at the Coulee City Park during the months of August and September?

Total for two months 16

4. How many times a week do you and your family use the Coulee City Park for water skiing or other related water sports?

Total for two months 10

5. How many times a week do you and your family go fishing in Banks Lake during the months of August and September?

Total for two months 16

6. How important is the lake to you and your family for recreation and exercise, for picnics, for instilling family values, for family reunions?

90% OF MY OFF TIME IS SPENT AT BANKS
80% OF THAT TIME IS SPENT AT COULEE CITY PARK

7. Other impacts to your customs, culture, and way of life: DROWNING THE WATER
LEVEL AT THIS TIME WOULD BE A GREAT LOSS

FOR MY WIFE & I - PLEASE LEAVE THE LEVEL

AS IT HAS BEEN IN THE PAST YEARS

JULY PUNNINGTON 304 PINEWOODS WAY E. VEN- 98802

THANK YOU FOR FILLING OUT AND RETURNING THIS QUESTIONNAIRE TO
THE CITY HALL, BIG WALLY'S, OR FULLER'S DRY FALLS MINI MART BY
5 PM WEDNESDAY, FEBRUARY 5, 2003.

01

COMMENT IE 72

March 25, 2003

Barbara Poulson
6230 West SR 260
Connell WA 99326

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
P.O. 815
Ephrata, WA 98823

Dear Mr. Blanchard,

I support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown to Banks Lake in Grant County

Rivers have multiple uses including flood control, hydropower, irrigation and recreation, protection of fish and wildlife and cultural resources. Any agency responsible for operational changes must take into account how the change will affect these other uses.

A drawdown of ten feet is not acceptable nor is it justified. There is no proof it will be effective in helping spawning fish.

Grant County Commissioner Tim Sneed fears a drawdown could cause health issues because it would form large mud bogs in the lake where mosquitoes could breed and may spread disease.

I believe the public is not aware of this action and am requesting additional Hearings be held in the lower part of Grant County.

Thank you,


Barbara Poulson

cc: Rep George Nethercutt.

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COMMENT IE 73

PRATHER'S WELDING & FABRICATION, INC.

March 26, 2003

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
P. O. Box 815
Ephrata, WA 98823

RE: Banks Lake Drawdown Draft Environmental Impact Statement

Dear Mr. Blanchard:

This letter is in regards to the Banks Lake Drawdown. I have been in business for sixteen years and over this time, we as business owners, strive to stay in business with continued change

With the economy already hurting, I don't believe we need any more stress on current businesses. I understand why this reservoir was put in and I know why you want to draw this lake down, but I don't feel it is a just cause to create hardship, as it has taken may years to build up park and recreation tourism dollars. We all know that you can lose a business overnight and take years to regain it back.

Please consider the impact on all the people involved.

Sincerely,

Kevin Prather
President



01

COMMENT IE 74

From Gene & Ruth Reynoldson
102 E Lewis St. Coulee City, WA.

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

We chose to live in Coulee City solely because of the lake. We like the small-town atmosphere and we like to fish. We have a small general contracting business so tourism generated by the lake's resources indirectly affect our source of income. We also have five grandchildren who come to visit us and enjoy the lake. They don't want us to move anywhere else because they too enjoy the small town and the lake. Drawing down the lake will affect our enjoyment, our families' enjoyment and greatly reduce our source of income. Please reconsider your options. Thank You —

Feel free to use back of form or attach a separate piece of paper.

01

COMMENT IE 75

Mr James Blanchard-Manager
Banks Lake Drawdown
Bureau of Reclamation
POB 815
Ephrata, WA 98823

April 10, 2003

Dear Sir, Please record this letter in Opposition to the Banks Lake Drawdown as an official part of the record. I own nearby property to the lake. My children swim in the lake in the summer by walking to the lake shore and entering the lake. This drawdown will expose them to having to walk several hundred feet over stagnant water and mud flats, infested with diseased mosquitoes.

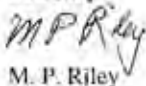
The Draft EIS fails to address the devastating effect upon local businesses. These businesses have a brief summer window of opportunity to make their annual sales. You will devastate local businesses by the drawdown causing tourists to go elsewhere.

Water is available to enhance Columbia River flows from Canada, and the Snake River, so there is no need for this drawdown. With salmon returns at record high levels it is obviously ocean conditions that largely govern salmon populations. The conclusions drawn in the draft EIS are an insult to any reasonable person of ordinary prudence.

The West Nile Virus that is now in Washington, and the probability that it will be enhanced by the drawdown is a given.

Additional time for comments on the Draft EIS is needed as the complexity of this document is extra-ordinary.

Sincerely,



M. P. Riley
W67N222 Evergreen Bld. #202
Cedarburg, Wisconsin 53012-2645

01

COMMENT IE 76



Mr. Jim Blanchard
Bureau of Reclamation
POB 815
Ephrata, WA 98823

Dear Mr. Blanchard,

I am writing you to express my concerns for the proposed Banks Lake drawdown. Not only am I opposed to it as GM of the recreational development, Rimrock Meadows, located on the Moses Coulee, but as current President of the Ephrata Chamber of Commerce. From a Rimrock perspective, this would adversely affect how our 950 members enjoy the recreation available at Banks Lake. This in turn would have a negative impact on the resorts and facilities at Banks. At a time when the economy is weak, this could deal a devastating blow to businesses that rely on the summer as their primary source of income. When are we to realize that people and their families are more important than a few fish!?! I am sure the water out of Banks is just a drop in the bucket to the mighty Columbia.

From an Ephrata standpoint, the same can be said. Ever try and take a left turn onto Basin from a sidestreet in the middle of summer? That stream of RV's and boats are headed to places like Banks Lake. The town of Ephrata needs that clientele to prosper. Heaven knows that Moses Lake, Soap Lake, and Coulee City do as well.

I am sure that I speak for the Chamber Board when I beg the Bureau to reconsider. I always believe that in the end, common sense usually prevails. I hope it does in this case. Thank you for your time and consideration.

Sincerely,



Kevin Danby
GM/ Rimrock Meadows
Pres/ Ephrata Chamber

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P.O. Box 1195 • Ephrata, WA 98823 • (509) 632-9800

COMMENT IE 77

April 6, 2003

**Coulee City still
needs you!**

The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

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Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

Please do not lower Banks Lake during August & September. It will be devastating to our community of Coulee City, which has evolved over the past 50 years from a farm business community to a tourist oriented community.

If you need more water - store more during wet years - sell less electricity out of the region. Retain smarter people

Feel free to use back of form or attach a separate piece of paper.

in the decision making process.

Sincerely Wesley J. Roberts

Box 815
Coulee City WA
98823

01

COMMENT IE 78

From: "News Standard" <newsstandard@centurytel.net>
To: <jblanchard@pn.usbr.gov>
Date: Thu, Apr 10, 2003 4:37PM
Subject: letter to editor

Letter to the Editor,

The proposed drawdown of Banks Lake for flow augmentation is an incremental step in an overall plan to remove the dams. We cannot let this happen. The dams are extremely necessary for clean power production, flood control, irrigation, and recreation. With terrorism and world uncertainty, we should in no way threaten or endanger our capability to grow our own food which we also share with the world.

Why are not real causes of salmon jeopardy addressed? such as—overfishing, millions of pounds of dead salmon thrown overboard as "bycatch", gillnetting increased water spillage from dams for flow augmentation which causes gas bubble death, introduction of species that eat salmon as walleye and shad, and other natural predators as birds and sea lions. There are also environmental conditions over which we have absolutely no control even if so-called environmentalists think we do. No reasonable person is against responsible stewardship of the land and its creatures but most of the activity carried on in the name of the Endangered Species Act is neither reasonable nor responsible.

With expenditures of \$500 million a year for salmon recovery, it is time to say STOP to being plundered. Shutting down hydropower does not help salmon runs. The salmon are not endangered. Much of the money for salmon recovery comes from citizens who pay their electrical bills and send it through utility districts to the Bonneville Power Administration which is required to give it to those supposedly fulfilling objectives of the ESA. This money for the most part is being used AGAINST us. It could be compared to forcing a condemned man to dig his own grave.

In chapter three of the Bureau of Reclamation Draft Environmental Impact Statement the visual quality of Banks Lake area is discussed. The scenic quality is described as appealing but evidence of human activity is described as intrusive. Does this mean that after the dams are removed rural cleansing will be the next step? Our form of government has been set up with three branches to provide checks and balances. Where are the checks and balances on ESA? The ESA has been placed above all. Bureaucrats have dictatorial power to do whatever they want in the name of the ESA no matter that what they want goes against measurable science and other laws. The ESA rules with an iron fist and requires that all bow down. In twenty-five years there is not one species that the ESA has saved from extinction. In the name of the ESA men have wreaked havoc. The ESA should be repealed. Drawing down Banks Lake is wrong.

Don't do it.

Linda Rushton

Box 696, Coulee City, WA 99115

443 words, signed copy being faxed also

ShirleyRae Maes, Editor/Publisher/Owner

News Standard

Serving the communities of Coulee City, Hartline, Almira & then some

PO Box 488, 405 West Main

Coulee City, WA 99115-0488

509.632.5402 Fax: 509.632.5732 Cell: 509-681-0014

newsstandard@centurytel.net

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04

COMMENT IE 79

Bill McDonald, Western Regional Director
Federal Bureau of Reclamation
1150 N. Curtis Rd. Suite 100
Boise, Idaho 83706-1234

March 30, 2003

To Whom It May Concern:

This is written in dissent regarding the proposed Banks Lake Drawdown. As a teacher and a former city council member for several years, I understand that the decision-making process can be tough, especially, if those making decisions feel that being "politically correct" in the eyes of powerful lobby groups such as the environmentalists, is more important than considering the best interests of the public. I'm a nature-lover, a fisherman, and one who believes in conserving our natural resources, but for the life of me I cannot understand a decision like this from "thinking people".

First of all, I happen to know that there were record runs of salmon this year, which no one discusses and I have yet to eat at a restaurant where I couldn't order salmon if I so desired. It's really a non-issue if you care and are truly concerned about people. I also know that this drawdown is completely experimental, at best. When, are those of you in authority, going to begin placing people before fish?

In an already hurting economy, this area, the Columbia Basin, would be devastated by a ten foot drawdown in August and September, the hottest months of the year. We have over two million people (more than annually visit Mt. Rainier National Park) traveling down the Coulee to take advantage of the primary resource this semi-arid desert has to offer—water—and all the recreational and agricultural activities associated with that. This will have a resounding negative impact on the economy of this entire region when no boats can be launched during the most popular recreational months of the year—not to mention the loss of water for an agricultural region already into the third year of drought.....and for what? An experimental program that will merely raise the Columbia River by 1/32 of an inch, having little or no effect on the salmon at McNary Dam, but huge and costly consequences for the hard-working people who are living in this area.

If you are simply flexing your muscles as a Federal Agency to prove that you can do what you want—we believe you. But you would have considerably more support and respect from the taxpayers if you used this power responsibly in the best interest of the majority of the people who live and work here.

Please consider this and the enclosed petition.

Respectfully,

Lynn R. Sanders

Lynn R. Sanders
Teacher and Citizen

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Feb. 22, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

1. The idea is theoretically supposed to help spawning salmon; however, statistics record that only once in 50 years would the effect actually have this effect.
2. The action WOULD DEFINITELY affect the recreational use of Banks Lake by leaving boat launches, and other attractions high and dry. Recreation is one of the primary focuses of the Columbia Basin Project and will definitely hurt those who use the lake for recreation and those who make a livelihood from recreation.
3. The draw down will also hurt the district's generating capacity at the hydropower plant at the south end of the lake.
4. There is a concern that the supply of irrigation water could be hampered in a scenario such as three years ago. Then, a fire knocked out some of the large pumps that draw water from behind Grand Coulee Dam into Banks Lake, which is then diverted through the project's system of canals and reservoirs. Since there have been late-season problems the last three years, this is a definite problem.
5. We will not stand idle as another example of sacrificing a rural community to the altar of Endangered Species Act goes forth. The Bureau of Reclamation cites the communities of Forks, Washington; Orofino, Idaho; and Klamath Falls, Oregon as examples of such sacrifice.
6. There have been no hearing in the Royal City community and by our signature we are requesting a public hearing before the close of the public comment. If not possible by the March 10 date, then we demand an extension of the public hearing process. Inadequate time for studying the documents and making intelligent comment has been allowed.

Signature	Printed Name	Address	Telephone	E-mail
<i>Beth Lang</i>	BETH LANG	9428 RA HWY (509) 787-0131		
<i>DeMantell</i>	Dan Mantell	820 Fairview	509 754 5144	
<i>Sandra Black</i>	Sandra Black	2498 RA 8 NW #13 (509) 787-1010		
<i>Lisa Wiersma</i>	Lisa Wiersma	2391 7 NW Ephrata	787-2802	
<i>Kathleen Adams</i>	Kathleen Adams	645 Mariposa Rd. Ephrata	754-2681	
<i>Jerry White</i>	Jerry White	191 IVY St SE Ephrata WA	754-4285	
<i>Lynn Sanders</i>	Lynn Sanders	245 E SE SW Ephrata WA	754-2390	
<i>Debbi Brown</i>	Debbi Brown	12061 Dodson NW Ephrata	754-1168	
<i>Judy Witt</i>	Judy Witt	14904 Rd B5 NW (509) 246-1949		
<i>Julie Baruff</i>	Julie Baruff	5340 Martin Rd. Ephrata	754-2684	
<i>EUGACON</i>	EUGACON	260 J STATE Ephrata	754-5172	
<i>Charstel R. [unclear]</i>	Charstel R. [unclear]	222 W 2nd Ephrata	754-3134	

COMMENT IE 80

Coulee City still needs you!



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Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

I feel this is an unfair
deal to impact so many
vacationers and locals.
no drawdown - Please!!
Mildred Scheibner
Box 165 Coulee City - WA - 99115

Feel free to use back of form or attach a separate piece of paper.

01

COMMENT IE 81

Coulee City still needs you!



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Just off who's more important
people or salmon?
This draw down certainly
will hurt this town.
We will have no income
from the park - this year
or even next year
people will go else where.
What a stupid idea.
people can live without
salmon.

Feel free to use back of form or attach a separate piece of paper.

This town can't survive
without the income from our park.
Rosemary Schrock

01

COMMENT IE 82

Coulee City still needs you!



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Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

Please, don't lower Banks Lake. If it is lowered to many ~~big~~ fish will be destroyed. Banks -

The Town of Coulee City and others around Banks needs tourists to survive. No water. No tourist. The farms will have less water for their crops. Remember No water - less crops, No food for you and me and ~~the world~~ - higher prices for what we do get!!

Feel free to use back of form or attach a separate piece of paper.

OVER →

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Lowering Banks will only
put in $\frac{1}{8}$ inch (if that) of water
in the River! What good
will that do for the Salmon?

01

Diane J. Shaff
+
Larry E. Shaff

PO Box 504
Soap Lake WA
98851

COMMENT IE 83

Lisa G. Smith
1316 Brooklane St.
Ellensburg, WA 98926

Bureau of Reclamation
C/o Jim Blanchard
Box 815
Ephrata, WA 98823

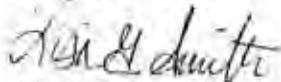
Jim Blanchard:

As a former local citizen of Coulee City, I am severely distressed to hear of the intent to draw down Banks Lake for the purpose of Salmon runs.

I have seen first-hand how this would affect just the local area. A few years ago when the lake was drawn down for darn repairs during prime tourist season, the tourism industry was virtually nonexistent. The surrounding area depends on tourism for their livelihood. Mud bogs were everywhere and mosquitoes thrived out of control. In this age where the economy is shaky at best and the West Nile virus is a concern, is drawing the lake down really the smartest action?

I have just stated a few of the flaws in this plan for the local area. But, this decision could affect several state's electrical rates and agricultural industries. Majority rules in this country. Who is more important, the "endangered" salmon, which are fished anyway, or the citizens of the Pacific Northwest?

Sincerely,



Lisa G. Smith

01

COMMENT IE 84

Thomas W. Sortomme
368 3rd Avenue SE
Ephrata, WA 98823
April 2, 2003

Dear Mr. Blanchard,

I am writing to express my opinion with regards to the proposed Banks Lake Drawdown. Based on what I have read I am opposed to the plan to drawdown Banks Lake to the 1560-foot level in August of each year. It appears that this proposal will have little to no positive impact on Salmon, and will have a large adverse impact on the economic and environmental situation of Banks Lake and the human population around it. Since the majority of the Salmon have already migrated from the Columbia River by August, it does not seem to make a lot of sense to provide additional water for their migration. Also, since we have just had two consecutive years of the largest Salmon returns on record, and Banks Lake was not reduced to assist this, it does not appear that lowering Banks Lake will provide additional benefit to the Salmon.

Thank you for allowing me to express my thoughts on this issue, and I hope that you will consider this before the final decision is made on lowering the level of Banks Lake. Again, I would like to state that I am against the proposal to lower the level of Banks Lake.

Sincerely,



Thomas W. Sortomme

01

COMMENT IE 85

From: gary suko <gsuko6@yahoo.com>
To: <jblanchard@pn.usbr.gov>
Date: Sat, Apr 5, 2003 9:47AM
Subject: Opposed to Banks Lake Drawdown

Dear Mr. Blanchard,

We are opposed to any drawdown of Banks Lake and other areas proposed by the Drawdown Draft Environmental Impact Statement. We feel that this is a theory and should be SCRUBBED. This past year the Salmon count was the largest recorded in a long time. As you can see The Environmentalists have spent millions on the WILD SALMON RECOVERY and have not proven a thing.

We should not sacrifice our rural communities and our livelihood by this Salmon Hoax theory.

Furthermore, We are opposed to any proposed dam removals by The Environmental Agency and it's Endangered Species Act. Please send a copy of the Final EIS to:

Gary Suko

1281 Fairway Dr Ne

Moses Lake, WA 98837

Thanks... Gary and Pat Suko Ph.766-8376

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Do you Yahoo!?
Yahoo! Tax Center - File online, calculators, forms, and more

COMMENT IE 86



April 10, 2003

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street
Post Office Box 815
Ephrata, WA 98823-0815

**Re: Banks Lake Draw down
Grand Coulee, WA**

Dear Mr. Blanchard,

We know that Banks Lake was originally never intended for recreational use, but over the years this has continued to increase each and every year. The Bureau has done a great job managing the resources of Banks Lake and we appreciate what you and your staff have done. Craig Sprankle has been more than helpful on many occasions.

All we are asking is that you consider the economic impact to a 10' draw down on Banks Lake and what this will mean too many of the recreational users. As an owner of Sunbanks Resort on the north end of the lake we would be unable to use our current launch area. It is my understanding that Coulee City and Steamboat Rock will also not be able to use their launch facilities. The economic impact is huge.

These camping and boating destinations rely on summer tourism for economic survival. Steamboat Rock State Park is a destination for 80,000 campers per year. Sunbanks Resort brings in over 35,000 campers per year. The State of Washington has told us that Steamboat Rock is the second busiest state park in their system of 84 parks. This state park becomes a large revenue source for the entire park system. A reduction in the revenue at Steamboat Rock would mean heavy losses and possible closures in smaller parks scattered throughout the state.

Grant County alone has over 20% of the families below the poverty level. This is among the highest in the entire state. Unemployment tops 11% and currently there are signs of local businesses closing. The only growth in this entire area is tourism. The Grand Coulee Dam is one tourist attraction, but the recreation on Banks Lake has continued to attract more and more tourists each year.

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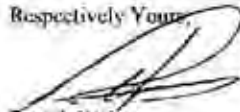
Jim Blanchard Letter/
Page 2

We are asking in making your decision to draw down Banks Lake from 5' to 10' in the month of August, that you reconsider your options. If you must draw down Banks Lake the extra 5', a one month delay to September would help us out tremendously and save our August tourist season. Please consider the human element in making your decision and the impact this has personally on individuals and their families.

03

Thank you for your consideration in this matter.

Respectively Yours,



Patrick Welton
Sunbanks LTD, Owner

Cc: Gail Norton, Secretary of the Interior, Washington D.C.
Lorie Butterly, Department of Natural Resources, Ephrata, WA
Tim Sneed, Grant County Commissioner, Ephrata, WA

CLEVE PINNIX
Director



STATE OF WASHINGTON

WASHINGTON STATE PARKS AND RECREATION COMMISSION

EASTERN WASHINGTON RESOURCES DEVELOPMENT OFFICE

2200 N. Duncan Drive • Wenatchee, Washington 98801-1007 • (509) 662-0422 • (SCAN) 365-0422

May 29, 2001

Mr. Jim Blanchard, Special Projects Officer
Bureau of Reclamation
32 C Street, Box 815
Ephrata, WA 98825

RE: Banks Lake Potential Drawdown - Initial Scoping Comments - NEPA EIS

Dear Mr. Blanchard:

The staff of the Washington State Parks and Recreation Commission (Commission) appreciates the opportunity to comment on the potential increased drawdown of Banks Lake. As a major provider of recreational opportunities in the affected region, the Commission is primarily concerned about significant adverse impacts to recreation that could result from a 10-foot drawdown during the peak use season.

Scoping documents should consider the following issues for further analysis in the NEPA EIS.

1. Recreational Impacts: A drawdown of 5-feet (normal operating range of the reservoir) would not have a significant impact on the operation of Steamboat Rock State Park and other recreational facilities that State Parks currently provides on Banks Lake under agreement with the Bureau of Reclamation. A drawdown of 10-feet would create conditions that would cause two boat launch lanes at Steamboat Rock State Park to become unusable. Likewise, the two launch lanes at Northrup Point would also become unusable. The use of the launch lane at Osborn Bay would be questionable. The primitive launch at Jones Bay would become unusable. The swim beach and the boat-in sites at Steamboat Rock State Park may also be adversely impacted.

2. Economic Impacts: A 10-foot drawdown occurring in the peak recreational use month of August, could have an adverse impact on attendance at the State Park facilities, where most of the use is water-dependent and/or water-oriented. This, in turn, would have a negative impact on revenue generated by fees at the affected parks, reducing the funds available to operate these facilities. There could be secondary economic impacts to the local communities. That loss to the local economy can be estimated at \$30 per person per day.

3. Biological Impacts: The biological impacts of an annual drawdown of this magnitude should be considered. Would changes in shoreline riparian and wetland areas (due to drying) adversely impact federally listed plant or wildlife species? Would changes in elevation of wind and wave erosion increase sedimentation/erosion rates - adversely impacting aquatic habitats? How would the estuary at Northrup Creek be affected? Would an increased drawdown increase the potential for increased noxious weed invasions? Would there be an adverse effect on the

roosting colony of bats near the mouth of Northrup Canyon? How would recreational fisheries be affected, including impacts to shallow-water aquatic habitat in Osborn, Crooks, and Jones Bay?

4. Impacts to Utilities: A 10-foot drawdown will result in a greater exposure of the power line laid on the lakebed that feeds Steamboat Rock State Park, increasing the potential for damage by the public and deterioration from climatic exposure.

5. Impacts to Cultural Resources: A 10-foot drawdown could result in a greater exposure of cultural resources, increasing the potential for looting and loss of site integrity.

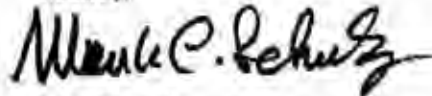
6. Aesthetic Impacts: Would the "bathtub-ring" effect caused by a 10-foot drawdown have a negative aesthetic impact, causing recreationists to relocate to other, more scenic areas?

7. Hydrologic Impacts: Would a 10-foot drawdown cause a shift in the hydrologic regime (both surface and groundwater) creating an adverse effect on the emergent and scrub-shrub wetlands at not only Banks Lake, but also at Sun Lakes State Park? Would ground water wells in the area be negatively affected?

If you have any questions on any of the above, please feel welcome to contact Jim Harris, Regional Manager at (509) 663-9717 or myself at (509) 662-0418.

Thank you for considering these comments.

Sincerely,



Mark C. Schultz
Regional Environmental Specialist

cc: William C. Jolly, Manager, Environmental Program
Dr. Robert Fimbel, Chief, Resource Stewardship Program
Jim Harris, Regional Manager, Eastern Region
Tom Poplawski, Manager, Steamboat Rock

COMMENT IE 87

Arnold J. Theisen
P.O. Box 755
Irrigon, OR 97844

March 17, 2003

Jim Blanchard
Bureau of Reclamation
32 C Street, P.O. Box 815
Ephrata, WA 98823-0815

Dear Mr. Blanchard,

I am opposed to the drawdown of Banks Lake for a number of reasons

It is time to stop putting the interests of fish ahead of the interests of people. Salmon are a valuable resource, but people are more important. The drawdown would have an adverse impact on many people living in the area and many others who visit the area for recreation. The minimal and dubious benefit to a few salmon is not worth the cost and disruption to those people's lives.

The potential harm to introduced species of fish should be factored into the equation. Introduced species like walleye, bass, and crappie represent a much more important fishery than they are credited for. We should not be killing these fish to save salmon. I am aware of the old argument that native species are more important than introduced species, but I don't buy it.

Banks Lake was never built to save salmon. It was built to serve as the basis for irrigating the Columbia Basin and it has done that mission admirably. Without the Grand Coulee Dam and Banks Lake this region would still be an arid dustbowl. Flushing that water down the Columbia River represents a gross misuse of a public resource that came to the taxpayers at great cost.

The regional and national economy is already in bad shape and destined to get worse by the ravages of war. Wasting water will simply aggravate an already bad situation. That water should be used to irrigate crops and promote a thriving tourism industry. It should not be flushed down the river to promote a dubious scientific endeavor that may or may not benefit a few salmon.

Sincerely,



Arnold J. Theisen

COMMENT IE 88

BUREAU OF RECLAMATION
P.O. BOX 815
EPHRATA, WASHINGTON 98823

APRIL 9, 2003

TO WHOM IT MAY CONCERN:

I AM STRONGLY OPPOSED TO THE BUREAU OF RECLAMATIONS PLAN TO RELEASE 130,000 ACRE FEET OF WATER INTO THE COLUMBIA RIVER FOR ANY REASON. WE, THE PEOPLE OF THIS COLUMBIA BASIN NEED THAT WATER.

I'M SICK AND TIRED OF THE FISH HAVING MORE RIGHTS THAN THE PEOPLE HAVE, AND I WANT IT STOPPED.

THAT WATER IS NEEDED TO IRRIGATE THE CROPS IN THIS AREA. RELEASING ALL THAT WATER WOULD HAVE A MAJOR IMPACT ON THE IRRIGATION OF THE AREA. OUR CROPS WILL DRY UP, AND THIS LUSH GREEN FARM LAND WILL ONCE AGAIN BECOME A DESERT WASTE LAND.

DO NOT WASTE THIS WATER! THERE ARE PLENTY OF SALMON. YOU CAN GO INTO ANY SUPER MARKET AND PURCHASE ANY TIME, OR GO TO ANY RESTAURANT ANYTIME, AND ORDER SALMON.

WE ARE ABLE TO RAISE ALL THE SALMON NEEDED. DON'T WASTE THIS WATER BY RELEASING IT INTO THE RIVER.

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Adam Throneberry
Adam Throneberry
1209 Jefferson Ave
Moses Lake, WA
98837

COMMENT IE 89

From: jrgold@nwi.net
To: <jblanchard@pn.usbr.gov>
Date: Fri, Apr 11, 2003 11:45AM
Subject: Banks lake drawdown

We do not believe a draw down of Banks Lake is a benefit to fish. Un till it is a proven fact we should not waste water at a time of potential drought. Until we stop catching endangered species we ought not put others in economic distress.

The E.S.A.seems to be a means to destroy rural America and job security for government employees. We protect species that feed on other protected species.

John & Ruth Umberger
1639 Hwy 153
Methow, WA 98834
509-923-2354

01

COMMENT IE 90

4/4/03
Jim Vondahl
Ewells Trailer Park
516 W. Walnut
PO Box 535
Coulee City Wa
99115

Dear Mr. Blanchard

I am the owner of a small Trailer Park, here in Coulee City, and have two items of concern regarding the Banks Lake drawdown.

First, as this will impact a large part of my summer income, are there any plans to help the local businesses?

Second, the last time the Lake was drawn down 2 years in a row, the Mosquito population exploded.

And as the West Nile Virus has been reported in this state, are there any plans to help the local Mosquito Control District?

I would appreciate your thoughts on this.

Thank you
Jim Vondahl

01

02

COMMENT IE 91

From: "Dan Voss" <vossfarms@pocketinet.com>
To: <jblanchard@pn.usbr.gov>
Date: Mon, Mar 24, 2003 9:21AM
Subject: BANKS LAKE PROPOSED DRAWDOWN: COMMENT

Voss Farms hereby supports the South Columbia Irrigation District's (SCID) opposition to the proposed drawdown of Banks Lake to divert water for the purpose of increasing Columbia River flows in an attempt to "help Snake River stragglers" (Jim Ruff, NOAA biologist).

The original planners of the Columbia Basin Project did not arbitrarily designate Banks Lake operational levels. Any change in flow could seriously damage crops and farm income especially during the hot months of August and September. Any return to normal flow after September would be of absolutely no consequence to irrigation as the canals here are emptied in October in any case.

We have over 900 acres irrigated pursuant to interruptible water service contracts. The SCIB director told us that our water supply could be interrupted as a result of this proposed drawdown. Our family farm would not survive a water interruption and we have been farming here since 1955.

Dan Voss.

cc: Director, SCID

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COMMENT IE 92

Coulee City still needs you!



The comment period on the *Banks Lake Drawdown Draft Environmental Impact Statement* has been extended to **April 11** but time is running out! The excellent turnout at the public hearing played a part in the extension of time for comments. The proposed 10-foot drawdown **WILL AFFECT** your park, swimming area and boat launch by making them unusable mud-flats during the months of August and September.

Help us make an impact by combining our statements, letters and comments to send to Jim Blanchard, Special Projects Officer, Bureau of Reclamation. Fill this out and drop it off at Coulee City Town Hall or mail.

Or you may mail your letter yourself to Mr. Blanchard at PO Box 815, Ephrata, WA 98823-0815 or fax 509-754-0239 or email jblanchard@pn.usbr.gov.

I work as the City Superintendent
for the Town of Coulee, Coulee City.
Aside from the loss of Park
revenue which would be extensive,
the loss of overall tourism
dollars to the Town would
be devastating.

Rod Webster
PO Box 398
Coulee City WA 99115

Feel free to use back of form or attach a separate piece of paper.

01

COMMENT IE 93

Page 1 of 1

rjwest

From: "rjwest" <west@fidalgo.net>
To: <jblanchard@pn.usbr.gov>
Sent: Monday, March 24, 2003 1:52 PM
Subject: Banks Lake Drawdown

Dear Mr. Blanchard,

Please do not allow the ten foot drawdown at Banks Lake! This recreation area is a vital part of the town of Coulee City not only for summer activities but for economic income due to tourism.

Many campers travel to that area and thoroughly enjoy this pleasant park at the edge of Banks Lake as well as the boating and fishing opportunities it provides.

I no longer live there but it is my home town and we frequently visit family there and quite often walk along the bank of the lake and enjoy watching the birds and animals that live there. I cannot imagine seeing this as a big mudflat in August and September. Is this wildlife any less important than the salmon? Are the children of this area (including my grandchildren) any less important? Swimming at the lake in Coulee City is a large part of summer activities for children in this small town. Would you deny them that? The town does not have a public pool so there is not another option.

Please rethink the plan to draw the lake down!

Sincerely,

June M. West

June M West
3720 W. 4th
Anacortes, WA
98221

01

3/29/03

COMMENT IE 94

Mr. Jim Blanchard
Special Projects Officer
Bureau of Reclamation
P. O. Box 815
Ephrata, WA 98823-0815
UCA-1600
ENV-1.10

April 6, 2003

Dear Mr. Blanchard,

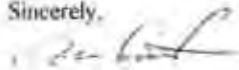
I oppose the drawdown of Banks Lake

This foolish proposal would further degrade the economy of Grant County. To lower Banks Lake - at the height of the tourist season - would endanger many small businesses, who depend on the summer tourist trade. This drawdown would also lower the income derived from the Irrigation Districts power generating facilities. This loss would have to be paid by the Columbia Basin Project farmers.

The perch and silver fisheries would take a beating, should the drawdown occur at this time of the year. The last couple of years, we have had salmon coming out of our ears, yet some biologist comes up with a plan, founded in junk science, to wreak havoc on Grant County, without any proven benefits for the salmon.

If the Snake River Salmon need more water - get it from the Snake River.

Sincerely,



Don White
32487 Moore Rd NE
Coulee City, WA 99115

01

COMMENT IE 95

BUREAU OF RECLAMATION
P.O. BOX 815
EPHRATA, WASHINGTON 98823

APRIL 9, 2003

TO WHOM IT MAY CONCERN:

I AM STRONGLY OPPOSED TO THE BUREAU OF RECLAMATIONS PLAN TO RELEASE 130,000 ACRE FEET OF WATER INTO THE COLUMBIA RIVER FOR ANY REASON. WE, THE PEOPLE OF THIS COLUMBIA BASIN NEED THAT WATER.

I'M SICK AND TIRED OF THE FISH HAVING MORE RIGHTS THAN THE PEOPLE HAVE. AND I WANT IT STOPPED.

THAT WATER IS NEEDED TO IRRIGATE THE CROPS IN THIS AREA. RELEASING ALL THAT WATER WOULD HAVE A MAJOR IMPACT ON THE IRRIGATION OF THE AREA. OUR CROPS WILL DRY UP, AND THIS LUSH GREEN FARM LAND WILL ONCE AGAIN BECOME A DESERT WASTE LAND.

DO NOT WASTE THIS WATER! THERE ARE PLENTY OF SALMON. YOU CAN GO INTO ANY SUPER MARKET AND PURCHASE ANY TIME, OR GO TO ANY RESTAURANT ANYTIME, AND ORDER SALMON.

WE ARE ABLE TO RAISE ALL THE SALMON NEEDED. DON'T WASTE THIS WATER BY RELEASING IT INTO THE RIVER.



01

02

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COMMENT IE 96

From: <Wewollard@cs.com>
To: <jblanchard@pn.usbr.gov>
Date: Tue, Mar 18, 2003 6:53PM
Subject: Banks Drawdoown

My friends, family and myself, a total of 35 to 40 people, have been going to Banks Lake for recreation since 1973 every year and mostly in the month of August. My wife and I liked it so much we bought 5 acres and built a house there to use for recreation. I am sure we won't have many people coming over to enjoy the lake if it is 10 feet low, as where we go will be a big mud flat.

01

I read the EIS and nowhere was there any proof, or conjecture for that matter, that this drawdown would help any endangered salmon. Which leads me to believe this whole drill is to make it appear the NMFS is doing something even if they don't know if it will help the salmon. Also I think the NMFS has way to much authority with nobody to answer to about what they do to other peoples rights and quality of life in the name of saving the fish.

02

I saw no thought given to alternatives for other ways of obtaining more water, like lowering Roosevelt less than a foot or lakes in B.C. or Idaho and the Snake River Lakes which have little or no recreation or economic impact. The only alternatives were which part of Aug. they would lower Banks with my preference being the last 10 days. Also it sounded like raising the level back to 1570' in the first 10 days of Sept. is just a pipe dream as there is always a shortage of water or power at that time of the year for an excuse.

03

I think is great to take comments from people like me but I hope this is not just another way to let people vent their feelings to make them feel better but the decision has already been made as happens way to often.

Wayne Wollard
Monroe, WA

CC: <Amn3546@aol.com>, <rlbsmith@bossig.com>

COMMENT IE 97

From: "Chris Hesse" <chesse@lemasterdaniels.com>
To: <jblanchard@pn.usbr.gov>
Date: Fri, Mar 7, 2003 1:30PM
Subject: Banks Lake drawdown

Mr. Blanchard,

I had previously commented over a year ago at the public meeting held in the Coulee City High School gym about the devastating effects that a month-long drawdown would have on the Coulee City community. I re-emphasize that opinion here and now.

Rural communities have benefitted from the government investment in infrastructure. Over the last five decades, tourism has become a major component of the Coulee City economy built around fishing and other recreation on Banks Lake. Because tourists spend dollars in Coulee City, the community continues to exist and provide benefits to the local, rural residents. Retail stores exist because of the tourism dollars that are spent. Jobs exist because the stores exist. Sufficient numbers of citizens may economically reside in Coulee City because the economy has built up around this infrastructure. The school is large enough to provide diversified education to the children of the residents.

Government should not now take that away from the community. By drawing down the water level of Banks Lake during the peak tourist season, the government is sending the message that tourists can forget about Coulee City as a destination for their fishing or recreational vacations in the month of August, and probably September. Banks Lake cannot afford another five feet of reduction in the lake level.

There has been no scientific data establishing that the additional flow from Banks Lake is needed in order to enhance fish traffic at McNary Dam. At this point, the government is merely speculating that this might be of assistance. First, the government must take into account the economic effects on communities before making such decisions. Second, the government must compare the economic costs against the scientific data (not mere speculation) of how the fish may benefit from the enhanced flows. To my knowledge, the government has performed neither of these necessary steps.

Christopher W. Hesse, CPA
480 North Frontage Road E.
Moses Lake, WA 98837

509-765-0290

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If you receive this message in error, please notify the sender immediately.

Thank you.

CC: <west@atnet.net>, <angus@eburg.com>, <jbates@moseslake-wa.com>

01

COMMENT IE 98

From: Brian Meiners <BMeiners@baf.com>
To: "jblanchard@pn.usbr.gov" <jblanchard@pn.usbr.gov>
Date: Thu, Apr 10, 2003 9:20AM
Subject: Banks Lake Drawdown

I am opposed to the proposed drawdown of Banks Lake. The draft Environmental Impact Statement (EIS) states, "The purpose of the proposed action is to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed salmonid stocks.." (italics added). The 130,000 acre feet of water from Banks Lake in late summer represents no more than a probability of meeting flow objectives. In other words, the need for the Banks Lake water is speculation, not established fact.

01

The proposed timing of the drawdown in late summer is peak tourism season in the area. Local economies will be adversely impacted particularly Coulee City as the water level in the lake will make all boat launches south of Grand Coulee inaccessible. This is an unacceptable result of a speculative action.

02

The drawdown threatens agricultural viability in the Columbia Basin by setting a dangerous precedent. This is of particular concern to me as an employee of Basic American Foods, a potato processor in the Basin for the past 38 years. The diversion of water from Banks Lake (an agriculture irrigation reservoir) to a use that is speculative in the value it will bring to juvenile fish survival opens the way for irrigation water curtailment, particularly in low river flow years. This precedent-setting drawdown of a reservoir in the Columbia Basin Reclamation Project portends a disregard for the value of agriculture in the Columbia Basin. As demonstration of this value, it is noteworthy that the Columbia Basin produces more tons/acre of potatoes than any other growing region in the world. According to a study done by Washington State University in 1996, the potato industry alone directly and indirectly generates over \$3 billion of sales throughout the Washington State economy. It is poor policy to implement practices that threaten such vibrant economic activity, especially when the policy is not backed by sound scientific data.

03

Brian Meiners
105 Schilling Drive
Moses Lake, WA 98837

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COMMENT IE 99

15 April 2003

Bureau of Reclamation
P. O. Box 815
Ephrata, WA 98823

RE: Banks Lake Drawdown

Dear Bureau of Reclamation:

The Washington State Potato Commission recently paid for a full page advertisement in the TriCity Herald (9 April, 2003) regarding a proposed release of 130,000 acre feet of water from Banks Lake into the Columbia River later this summer, and that release's effect on Washington State potato industry.

Respectfully, I offer two observations:

1. The fish were here first, and anything we can do to insure their continued survival, we need to be doing, including releasing 130,000 acre feet of water from Banks Lake.
2. We live in a desert. The nature of deserts is that they tend to be places with very little irrigation water, and just because someone decides they want to grow potatoes in a desert, and/or have grown potatoes in a desert doesn't mean they always get to do so.

Sincerely,



Judith R. Warner Ph.D.
62407 N. 68, PR NW
Benton City, WA 99320

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Petitions received without letters follow.

*****BANKS LAKE DRAWDOWN PETITION *****
FARMERS - FISHERMAN PLEASE TAKE NOTICE & SIGN

Feb. 22, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

1. The idea is theoretically supposed to help spawning salmon; however, statistics record that only once in 50 years would the effect actually have this effect.
2. The action WOULD DEFINITELY affect the recreational use of Banks Lake by leaving boat launches, and other attractions high and dry. Recreation is one of the primary focuses of the Columbia Basin Project and will definitely hurt those who use the lake for recreation and those who make a livelihood from recreation.
3. The draw down will also hurt the district's generating capacity at the hydropower plant at the south end of the lake.
4. There is a concern that the supply of irrigation water could be hampered in a scenario such as three years ago. Then, a fire knocked out some of the large pumps that draw water from behind Grand Coulee Dam into Banks Lake, which is then diverted through the project's system of canals and reservoirs. Since there have been late-season problems the last three years, this is a definite problem.
5. We will not stand idle as another example of sacrificing a rural community to the altar of Endangered Species Act goes forth. The Bureau of Reclamation cites the communities of Forks, Washington; Orofino, Idaho; and Klamath Falls, Oregon as examples of such sacrifice. April 11th final date to have petition delivered.

Signature	Printed Name	Address	Telephone	E-mail
<i>Susan P. Holloway</i>	SUSAN P. HOLLOWAY	1020 E. Roundtable Cr.		JKHoll1@aol.com
<i>James K. Holloway</i>	JAMES K. HOLLOWAY	6200 Roundtable Cr.		
<i>William J. Hogue</i>	W. J. HOGUE	8230 Sunset Ct. Spokane	99115 (509) 464-1226	
<i>Patricia B. Ringquist</i>	PATRICIA B. RINGQUIST	1502 N. Chesapeake Dr.		Greenwood Johnson PAC Comm
<i>Rick M. Mauck</i>	RIK MAUCK	10351 Rd 10 SE	Spokane WA 99357 (509) 468-9449	
<i>Jeff W. Mauck</i>	JEFF MAUCK	11735 N. BASSE	OTHELLO	
<i>Andy H. Reed</i>	ANDY H. REED	11752 Edison	Repa/cik/50. 99357	

March 12, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

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7. Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	BERNARD FRIEHE	2484 S. N.L.	98832	765-4554
<i>[Signature]</i>	Heath Gimrestad	930 Hawthorne	98837	hgmrestad@benton-ten.com
<i>[Signature]</i>	Racal Bolder	1221 A. Tubell	98837	racal@benton-ten.com
<i>[Signature]</i>	Juan Montemayor	344 N. Grape Dr.	98831	jmontem@qwest.net
<i>[Signature]</i>	Julia Ramirez	6647 Stillpoint Rd	98832	766-2292
<i>[Signature]</i>	JIM SNYDER	1325 REYNOLDS RD	98844	488-1847
<i>[Signature]</i>	Joe Hernandez	P.O. Box 622	-	349-8015
<i>[Signature]</i>	Ramiro Gutierrez	5024 Warden	98839	349-0507
<i>[Signature]</i>	Jose Juan Prieta	P.O. Box 201 Warden	WA	509-8823
<i>[Signature]</i>	Michael Kramling	P.O. Box 1174 Warden	WA	98857, 349-2492
<i>[Signature]</i>	Donald R. Bederman	2224 Admiral Rd	Moss Lake, WA	
<i>[Signature]</i>	Felix P. Pineda	Clarke P.O. Box	692 Warden	WA 98839
<i>[Signature]</i>	Jose Pablo Rodriguez	P.O. Box 1000 Warden	WA	98839
<i>[Signature]</i>	Concepcion Martinez Jr	P.O. Box 711	Warden	349-0377
<i>[Signature]</i>	Wanda J. Buckel	104 Dublin Dr	MI	766-7862
<i>[Signature]</i>	Deana M'Gowan	153 Young Rd	Moss Lake WA	765-4005
<i>[Signature]</i>	CHRIS MARCHAND	1138 S. Jefferson Ave	MI	765-1903

March 12, 2003

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7. Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	Carla Fricke	2446 Rd 5 NE	509 765 4564	
<i>[Signature]</i>	Michele Roseburg	2441 Rd 5 NE	509 765 6350	
<i>[Signature]</i>	Matthew Roseburg	2301 Rd 4 SE	509 765 7072	
<i>[Signature]</i>	Seamus Brown	2301 Rd 4 SE	509 765 7077	
<i>[Signature]</i>	Carla Fricke	2441 Rd 5 NE	509 765 4564	
<i>[Signature]</i>	Karen Hargrave	1868 Bluff Dr	509 765 1224	
<i>[Signature]</i>	Mike Hargrave	1868 Bluff Dr	509 765 1224	
<i>[Signature]</i>	Garland S. Fouse	3034 Rd 1 NE	509 765 2143	

March 12, 2003

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7. Signature Printed Name Address Telephone E-mail

Deanna Hendrickson Deanna Hendrickson 745 3rd 1/2 NE ML 765-765-9995
Cheryl Hendrickson Cheryl Hendrickson 7453 Rd 1/2 NE Merit Lake WA 765-3995
Darin Hendrickson Darin Hendrickson 1503 Jameson, Lake 765-1316
Andrea Hendrickson Andrea Hendrickson 5415 Rd 1 NE ML 765-4313
John R. Dickert 11-10 8 1/2 Rd 8 NE ML 765-3924
Robert H. Dickert 19653 Bk E NE ML 765-4035
Robert H. Dickert Robert H. Dickert 1123 St Helen's Dr. ML 764-7125
Robert H. Dickert Robert H. Dickert 19653 Bk E NE ML 765-2251

March 12, 2003

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Signature	Printed Name	Address	Telephone	E-mail
	Jennifer Rathbun	11990 Rd H.W.F.		ML 98837
	Dana Hansen	10865 Rd. 5.2 N.E.		ML 98837
	Forest G. O'Zell	70 W. 2nd St. 1364 S. 1st St. LAKE WA 98851		

March 12, 2003

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7. Signature Printed Name Address Telephone E-mail

Don Prentice Don Prentice 14174 6th Ave SE 509-765-5715
 Arthur L. Prentice Arthur L. Prentice 14174 6th Ave SE 509-765-5715
 Charles H. Prentice Charles H. Prentice 14174 6th Ave SE 509-765-5715
 Shannon R. Prentice Shannon R. Prentice 14174 6th Ave SE 509-765-5715
 Don Prentice Don Prentice 14174 6th Ave SE 509-765-5715

March 17, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

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6. Additional Hearing need to be held in the lower part of Grant County. If not possible by the April 11th date, then we demand an extension of the public hearing process. Inadequate time for studying the documents and making intelligent comment has been allowed.

Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	Johnnie K. Barton	434 E. 1st St. Puyallup, WA	763-6457	
<i>[Signature]</i>	Janice A. Harris	10104 Grace Lane Moses Lake WA	766-7794	
<i>[Signature]</i>	Donna L. Bradley	89515 Tucker Loop, Moses Lake	766-6471	
<i>[Signature]</i>	Monica Barton	434 E. 1st St. Puyallup, WA	763-6457	
<i>[Signature]</i>	Kelly Pugh	11744 E. 9th St. Moses Lake WA	766-4499	
<i>[Signature]</i>	Michelle - Pugh	4977 Westside Dr. Moses Lake WA	766-5150	
<i>[Signature]</i>	Janice A. Harris	10104 Grace Lane Moses Lake WA	766-7794	
<i>[Signature]</i>	Donna L. Bradley	89515 Tucker Loop, Moses Lake	766-6471	
<i>[Signature]</i>	Janette Rogers	8092 Rd 24 unlisted		
<i>[Signature]</i>	Julie Boyer	8092 Rd 24 unlisted		
<i>[Signature]</i>	Razlene Muncie	1111 N. Craig ML	762-9191	
<i>[Signature]</i>	Beverly Dyer	402 W. Loop Moses Lake	764-0235	
<i>[Signature]</i>	Wetake Schriber	1815 Main St. Moses Lake	766-9887	
<i>[Signature]</i>	Lionel Lindrick	1508 Kromer Ave ML	95827	
<i>[Signature]</i>	Isori R. Garrett	709 Sage Basin Moses Lake WA		
<i>[Signature]</i>	Russell Cooper	4441 Reardon Rd. Moses Lake		
<i>[Signature]</i>	Calypso	811 Sandance Rd. SE. 765-6954		calypso@comcast.net

March 17, 2003

We, the undersigned, citizens of the United States of America, the State of Washington, do support the OPPOSED position of the three Columbia Basin Irrigation Districts in regard to the proposed drawdown of Banks Lake in Grant County for the following reasons:

1. The idea is theoretically supposed to help spawning salmon; however, statistics record that only once in 50 years would the effect actually have this effect.
2. The action WOULD DEFINITELY affect the recreational use of Banks Lake by leaving boat launches, and other attractions high and dry. Recreation is one of the primary focuses of the Columbia Basin Project and will definitely hurt those who use the lake for recreation and those who make a livelihood from recreation.
3. The draw down will also hurt the district's generating capacity at the hydropower plant at the south end of the lake.
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Signature	Printed Name	Address	Telephone	E-mail
<i>[Signature]</i>	Robert F. Phillips	1440 5th St. N. W.	765-6746	
<i>[Signature]</i>	Pat Hochstetler	10257 2nd Ave. N.	765-4268	
<i>[Signature]</i>	James Mackay	8661 1st Ave. N.	765-0924	
<i>[Signature]</i>	DALE CERUI	117 E. 17th Ave. N.E.	765-5231	
<i>[Signature]</i>	KIM SIMPSON	209 S. Oak Way	765-0781	
<i>[Signature]</i>	Karen Oltman	226 Sybil Ave.	765-3827	
<i>[Signature]</i>	PETE CARPENTER	210 CRESTVIEW	765-1527	
<i>[Signature]</i>	WILLIAM LARSON	P.O. Box 116	GRAND COULEE WA	
<i>[Signature]</i>	Patricia A. Velts	4298 Orchard Dr.	765-3737	
<i>[Signature]</i>	Gregory A. Velts	4298 Orchard Dr.	765-3737	
<i>[Signature]</i>	Kevin C. Gallagher	3921 W. Pennine Dr.	765-3737	
<i>[Signature]</i>	Charles D. Walker	3921 W. Pennine Dr.	765-3737	
<i>[Signature]</i>	Virginia Mendez Walker	3921 W. Pennine Dr.	765-3737	
<i>[Signature]</i>	Barbara Kerr	4281 Orchard Dr.	765-3737	
<i>[Signature]</i>	Jon Meade	4281 Orchard Dr.	765-3737	

Signature	Print Name	Address	Phone	E-mail
<i>[Signature]</i>	DAN KENYON	4745 RD 28 NW		
<i>[Signature]</i>	LENORA CORDEN	210 28TH AVE SE		
<i>[Signature]</i>	Pamela HANLEY	1088 RA 5.2 NE	765-6421	

March 17, 2003

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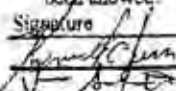
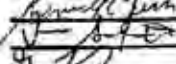
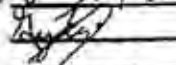
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Signature	Printed Name	Address	Telephone	E-mail
	Paul Corbin	1713 Tanager Dr.	253-1014	Corbin.S@egosi.net
	DANIEL PARKER	4024 RD. 1 NE	765-5425	
	Steve Dugan	8926B Tanager Dr ML	762-5825	
	Terry Billups	Warden	349-2502	
	Lyle K. Bair	10445 RD 20 NE ML	545-7255	
	P.O. Box 321 Ephrata	WA 98825		
	11451 Rd 10 NE	Moses Lake WA 98837		
	11767 Rd 10 NE	Ephrata WA 98837		
	9761 Rd H NW	Ephrata, WA 98823		
	9894 RD 19 NE	MOSES LAKE, WA, 98837		
	1094 Lake Leslie Rd	Warden WA 98837		
	11493 Rd 4 S.E.	Moses Lake WA 98837		
	9581 Rd 12 NE	Moses Lake WA 98837		
	Joseph Kautsch	2624 R/Q St Quincy, WA 98848		Paul Kautsch
	P.O. Box 1144	Moses Lake, WA 98837		
	41950 RD A NE	Moses Lake WA 98837		
	2365 RD L NE	Moses Lake WA 98837		

March 17, 2003

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Signature	Printed Name	Address	Telephone	E-mail
	Kenneth McGehee	3297 Placer	2492 716	
	Ken Schmitt		488-7554	
	GREG FORKAN		765-5785	

Interested Organizations — IO

COMMENT IO 01**BIG BEND ECONOMIC DEVELOPMENT COUNCIL**

410 W. Third Avenue, Moses Lake, Washington 98837
Ph/FAX: 509-764-8591 E-mail: bbcdc@moseslake-wa.com

Mr Jim Blanchard
Special Projects Officer
Bureau of Reclamation
POB 815
Ephrata, WA 98823

February 25, 2003

Dear Mr Blanchard:

The Big Bend EDC Board of Directors is opposed to the action alternative of the ten foot drawdown of Banks Lake. The risk to the area economy, as well as that of eastern Washington, is far greater than any benefit for fish.

The last several years have recorded fish runs far greater than anything since 1933, so what is to be gained by devastating local economies?

This drawdown will cause receding shorelines to expose hundreds of feet of stagnant pool water and the mud flats will provide excellent breeding grounds for the West Nile Virus.

Recreation, especially boating and fishing, will be devastated.. Small businesses that cater to these recreational events will be devastated.

Increasing Columbia River flows at in the late summer does not assist the ESA listed fish, as they are not present at this time.

There appears to be no science to support this drawdown and even the NPPC is questioning this proposed drawdown. This spring has the potential for extremely low snow melt. If this is followed by no rain, this drawdown could create an environmental nightmare, from which there may be no recovery.

The Big Bend EDC urges you to cancel this proposed drawdown.

For the Board,



Irwin W. Graedel-Chairman

01

02

03

04

"Planning For The Future.....TODAY!"

COMMENT IO 02

10 April, 2003

Mr Jim Blanchard
Bureau of Reclamation
P.O. Box 815
Ephrata, WA 98823

Dear Sir:

I am writing to contest the proposed Banks Lake drawdown, Summer 2003, or any other time.

I believe it is in total violation of good faith, economic benefit and the will of the people of Grant County and the Greater Columbia Basin and the US Government/Congress from its inception to the present to decrease any water level in Banks Lake from its previously established normal water level.

The devastating economic impact would be felt at all levels of the community, county & state.

The proposed drawdown's negative economic impact on human livelihood, esthetic beauty, ecosystem imbalance, and loss of tourism industry far exceeds any proposed justification to do so.

This proposal must be reviewed and cancelled immediately.

Respectfully Submitted,

Shirley J. Nozmaier
Big Bend Economic Development Council,
Board Member
253 W. Northshore Drive
Moses Lake, WA 98837
509-765-6406

01

COMMENT IO 03

Coulee City Chamber of Commerce

P. O. BOX 896
COULEE CITY, WA 99115

APRIL 4, 2003

JIM BLANCHARD
SPECIAL PROJECTS OFFICER
BUREAU OF RECLAMATION
P.O. BOX 815
EPHRATA, WA 98823-0815

RE: BANKS LAKE DRAWDOWN DRAFT EIS

DEAR MR. BLANCHARD:

I'M WRITING ON BEHALF OF THE COULEE CITY CHAMBER OF COMMERCE. THE CHAMBER HAS GIVEN VERBAL TESTIMONY AT THE PUBLIC HEARINGS. AT THE LAST HEARING, THE CHAMBER SUPPORTED THE TESTIMONY THAT COULEE CITY MAYOR, OTTO JENSEN AND GRANT COUNTY COMMISSIONER, TIM SNEED PRESENTED AGAINST THE PROPOSED DRAW DOWN.

01

THE CHAMBER MEMBERS KNOW FROM THE FIRST HAND EXPERIENCE WITH THE PRIOR 10 FOOT DRAW DOWN IN 1996, THAT THE DRAWDOWN MAKES THE COULEE CITY PARK, SWIMMING BEACH, BOAT DOCKS AND BOAT LAUNCH UNUSABLE. THE DRAW DOWN REDUCED CITY PARK CAMPING FEES BY 1/3RD AND ALSO REDUCED GROCERY STORE SALES, RESTAURANT SALES, MINI MART SALES, MOTEL SALES AND HARDWARE STORE SALES. ONE MEMBER REPORTED THAT IT TOOK UNTIL 2001 TO REGAIN THE VOLUME OF SALES FOR THE MONTHS OF AUGUST AND SEPTEMBER THAT HE HAD PRIOR TO THE 1996 DRAW DOWN.

02

THE CHAMBER MEMBERSHIP DIRECTLY SAW THE EFFECTS OF THE DRAWDOWN ON THE FISHERY IN BANKS LAKE WITH THE VIRTUALLY ELIMINATION OF THE PERCH FISHERY THAT THE CHAMBER HAD RELIED ON FOR SUCCESSFUL YOUTH FISHING DERBIES IN LATE APRIL FOR MANY YEARS. THAT FISHERY STILL HAS NOT COME BACK IN 2003, SEVEN YEARS LATER AND THE CHAMBER NOW HAS TO WORK WITH STATE DONATED AND CHAMBER PURCHASED FISH EACH YEAR TO PUT ON THE DERBY.

03

THE CHAMBER MEMBERSHIP BELIEVES UPPER 10 FEET OF THE LAKE IS WHERE THE FOOD AND THE COVER FROM PREDATORS IS FOR THE NEWLY HATCHED FISH. ALSO JUST THE PHYSICAL REDUCTION IN THE LAKE VOLUME LEFT THE YOUNG FISH VULNERABLE TO THE PREDATOR FISH AS BORN OUT BY THE IMPROVED WALLEYE FISHING THE NEXT YEAR.

04

IN REVIEWING NEWS PAPER ARTICLES ABOUT THE DRAW DOWN, THE CHAMBER STILL SEES THE REPEAT OF THE MYTH THAT SOME PEOPLE, IE. A BASS FISHING GROUP. BELIEVE THAT A DRAW DOWN WOULD IMPROVE FISHING IN BANKS LAKE. THIS MYTH STARTED WITH AN ARTICLE BY RICH LANDERS IN THE SPOKESMAN REVIEW WHERE HE QUOTES STATEMENTS MADE BY AN INDIVIDUAL FROM WILBUR WASHINGTON, THAT CLAIMS TO REPRESENT A BASS FISHING PRESERVATION GROUP, HE BELIEVES THAT TREES - BRUSH ETC. CAN BE PLANTED ALONG THE LAKE SHORE AND THAT WILL IMPROVE BASS FISHING. THE COULEE CITY CHAMBER HAS BEEN UNABLE TO FIND CONTINUING APPRECIABLE SUPPORT FOR THE PROJECTS THAT THE GENTLEMEN ESPOUSES EITHER IN THE GRAND COULEE AREA AT THE NORTH END OF BANKS LAKE OR THE COULEE CITY AREA AT THE SOUTH END OF THE LAKE. CHAMBER MEMBERS HAVE ALSO BEEN ADVISED THAT THE BASS GROUP WAS TOLD THAT THERE WAS A HIGH PROBABILITY THAT THE TREES AND BRUSH WOULD NOT SURVIVE, AS THEY DID NOT, BEFORE THE PROJECT WAS UNDER TAKEN. THE INDIVIDUAL ALSO IS PART TIME EMPLOYEE BY THE ONLY PRIVATELY RUN BOAT RAMP THAT WILL BE USABLE IN THE DRAW DOWN OCCURS. THE OTHER USABLE BOAT RAMP IS THE DAY LAUNCH AT STEAMBOAT STATE PARK BOTH AT THE UPPER END OF THE LAKE OVER TWENTY MILES AWAY FROM THE COULEE CITY AREA.

05

THE CHAMBER WOULD ALSO LIKE TO POINT OUT THAT THE GENTLEMEN DID ATTEND THE LAST PUBLIC HEARING HELD IN COULEE CITY AND CHOSE NOT TO VERBALLY TESTIFY TO HIS OPINIONS REGARDING THE SUPPOSED BENEFITS OF THE DRAW DOWN WHERE COULD BE REFUTED BY OTHER KNOWLEDGEABLE COMMUNITY MEMBERS.

AFTER THE 1996 DRAWDOWN, THE COULEE CITY CHAMBER OF COMMERCE'S TELEPHONE ANSWERING SERVICE HAD TO RESPOND TO INQUIRES AS TO THE LEVEL AND USABILITY OF THE LAKE DUE TO THE MUD FLATS CAUSED BY THE DRAWDOWN FOR THE NEXT TWO TO THREE YEARS. THE CHAMBER MEMBERS WONDER HOW MUCH BUSINESS WAS LOST TO TOURIST THAT DIDN'T BOTHER TO CALL BUT JUST ASSUMED THE LAKE WAS AGAIN UNUSABLE DUE THE DRAW DOWN DURING THE MONTHS OF AUGUST AND SEPTEMBER.

06

OVER THE YEARS, THE TOWN OF COULEE CITY HAS GROWN MORE AND MORE TO DEPENDENT ON THE TOURIST INDUSTRY TO SURVIVE AND MAINTAIN A BUSINESS DISTRICT, AS THE LOCAL FARMING COMMUNITY CONTINUES TO LOSE POPULATION BASE. MOST OF THE BUSINESS IN COULEE CITY CAN NOT SURVIVE WITHOUT THE SUMMER TOURIST. IF YOU DON'T BELIEVE THE CHAMBER, LOOK AT WHAT HAS HAPPENED TO THE BUSINESS DISTRICTS IN HARTLINE AND ALMIRA, ONCE THRIVING FARMING COMMUNITIES, WITHIN 20 MILES OF COULEE CITY BEFORE THE FARMS GOT LARGER AND LARGER TO SURVIVE.

THE TOURIST SEASON IS FROM MAY THROUGH SEPTEMBER. A FIVE MONTH PERIOD. WITH THE MAJORITY OF THE TOURIST VISITING FROM MID JUNE TO LABOR DAY, A THREE MONTH SEASON. THE DRAW DOWN WOULD SHARPLY CURTAIL OR ELIMINATED 33% OF THE SHORT SEASON OR 20% OF THE LONGER SEASON THUSLY DEVASTATING TO THE BUSINESSES.

06

THE CHAMBER MEMBERSHIP CAN NOT UNDER STAND THAT WHEN THE BUREAU LOOKS AT THE KNOWN DAMAGE THAT THE DRAWDOWN CAN DO TO THE TOWN OF COULEE CITY AND SURROUNDING AREA THAT IT POSSIBLY COULD BE WILLING. TO SUPPORT A THEORETICAL PROJECT, THAT HAS UNDOUBTEDLY BEEN DEVELOPED FROM PREDETERMINED OUTCOME FISHERIES STUDIES, THAT CAN NOT POSSIBLY BE PROVEN TO HAVE ANY BENEFIT AND OR EFFECT ON THE SALMON RUNS IN THE SNAKE RIVER. TO THE MEMBERS OF THE COULEE CITY CHAMBER OF COMMERCE, IT ALSO SEEMS UNBELIEVABLE THAT THE PEOPLE HAVE COME TO THE POINT WHERE THEY HAVE TO CONSTANTLY DEFEND THEIR LIFE STYLES AND ABILITY TO PROVIDE A LIVING FOR THEIR FAMILIES AGAINST GOVERNMENT AGENCIES THAT PROMOTE UNSUBSTANTIATED THEORIES AND EXPERIMENTATION IN THE NAME OF ENVIRONMENTALISM TO THE DETERMENT OF THE LOCAL COMMUNITIES.

07

THANK YOU FOR THE OPPORTUNITY TO EXPRESS THE VIEWS OF THE COULEE CITY CHAMBER OF COMMERCE.

SINCERELY,



ALLAN FOX, PRESIDENT

COULEE CITY CHAMBER OF COMMERCE



PAUL CHARLTON, VICE PRESIDENT

COULEE CITY CHAMBER OF COMMERCE.

COMMENT IO 04



**Columbia
Basin
Development
League**

REGIONAL TRUSTEES

DOUG SOUTHERLAND, *Commissioner of Public Lands*
VALORA LOVELAND, *Director of Agriculture*
DAVID ROSELEIP, *President, Washington Agriculture and
Forestry Education Foundation*

CHAIRMAN

Kevin Lyle
802 S. Johnson Rd
Othello, WA 99344
(509) 234-6482

VICE CHAIRMAN

Mike LaPlant
3891 Rd F NW
Ephrata, WA 99323
(509) 787-2458

TREASURER

Jake Wollman, Jr.
1354 W. Herder Rd
Warden, WA 98857
(509) 249-8043
FAX (509) 249-8886

EXECUTIVE SECRETARY

Alice Parker
2582 Rd K SW
Royal City, WA 99357
(509) 346-5442
FAX (509) 346-9442
map@levar.com

Written Comments to U.S. Bureau of Reclamation From Columbia Basin Development League Alice Parker, Executive Secretary Regarding Banks Lake Drawdown DEIS

AREA TRUSTEES

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RUSSELL
2100 N. W. 10th St
Okanogan, WA 99265

Chelan
DANIELA L. JOHNSON
1000 N. 1st St
Chelan, WA 98830

Shelton
TOM FLINT
1000 N. 1st St
Shelton, WA 98949

Spokane
TOM FLINT
1000 N. 1st St
Spokane, WA 99201

Liberty
ALBERT GRASS
1000 N. 1st St
Liberty, WA 99019

Maple Valley
JIM BROWN
1000 N. 1st St
Maple Valley, WA 99026

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Prosser
RUI CHRISTOPHER MANDOK
1000 N. 1st St
Prosser, WA 99350

Warden
STEVE SCHMIDT
1000 N. 1st St
Warden, WA 98857

The Columbia Basin Development League is a non-profit organization with the mission "to provide support for the Columbia Basin Irrigation Project and its future development, to protect its water rights and educate the public on the renewable resource and multi-purpose benefits of the project." Our membership consists of individuals, businesses, and entities that are involved or support the Columbia Basin Project.

The Columbia Basin Development League wants to go on record agreeing with the three Columbia Basin Irrigation Districts position in opposing both, the No Action Alternative and the Action Alternative.

We are concerned about the reliability of the water supply for the Columbia Basin Project (CBP). Banks Lake is the holding reservoir for the CBP's water supply. A drawdown of the CBP water supply could have a severe economic impact on the viability of the entire Central Washington area, as well as a devastating impact on recreational opportunities within the area including Banks Lake. Studies and information show there is no value to a drawdown of Banks Lake.

As projections indicate we are facing additional dry years and short water supplies. We must be prepared for these projected dry years. Sending CBP water out to the ocean in the name of flow augmentation for fish is not wise nor prudent. Recent studies are showing no value of flow augmentation to fish survival.

01

02

The National Marine Fisheries Service mandating that this analysis be done in compliance with Action 31 of the Reasonable and Prudent Alternative under the December 200 Biological Opinion for operation of the Federal Columbia River Power System has proven to be costly and time consuming in preparing this Draft EIS. We believe it does not show a valid reason for a drawdown. We therefore believe it does not merit any drawdown of Banks Lake to augment fish flows in the Columbia River.

02

The Federal Government has made a valuable investment in the Columbia Basin Project. The project is a valuable multi-purpose project. When any purpose, whether it be irrigation for production agriculture, recreation and/or resident fish and wildlife habitat and hydro power generation is adversely impacted, it is not prudent to pursue such action as the proposal of drawing down Banks Lake.

03

The recreational opportunities that Banks Lake has created are in jeopardy if Banks Lake is drawdown 10 feet. All but two boat docks will be left high and dry. August is a big vacation time for families. The drawdown will cause a loss of revenue for recreation dependent businesses in the area. Once you loose a customer or client it is have been proven it often is a loss forever. The loss of revenue in any one area will have a ripple effect on everyone and it will be felt by the entire area.

The Columbia Basin Development League hopes you will carefully examine all comments and take into consideration the economic impacts to the entire area and to the economic well being of this valuable Federal multi-purpose project. Our nation, state and area are currently experiencing economic hard-times. Lets not add to these hardships by imposing a Banks Lake Drawdown.

We thank you for giving us the opportunity to comment on the Banks Lake Drawdown Draft Environmental Impact Statement.

Alice Parker, Executive Secretary
Columbia Basin Development League
8582 Rd. K SW
Royal City, WA 99357
509-346-942
musp@televar.com

COMMENT IO 05



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 NE Oregon, Suite 200, Portland, Oregon 97232

Telephone 503 238 0667

Fax 503 235 4228

March 10, 2003

William D. Grey
Deputy Area Manager
Bureau of Reclamation
Ephrata Field Office
P.O. Box 815
Ephrata, Washington 98823

RE: Comments on Draft Environmental Impact Statement; Banks Lake Drawdown; Douglas and Grant Counties, Washington

Dear Mr. Grey:

The Columbia River Inter-Tribal Fish Commission (CRITFC),¹ on behalf of the Confederated Tribes and Bands of the Yakama Nation (YN), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Confederated Tribes of the Warm Springs Reservation of Oregon and the Nez Perce Tribe has reviewed the document entitled, *Draft Environmental Impact Statement; Banks Lake Drawdown; Douglas and Grant Counties, Washington* (herein: DEIS). We offer the following general and specific comments on the DEIS.

General Comments

In comments on the 2000 FCRPS Biological Opinion, in scoping comments on the environmental analysis for this project, and in discussions with Reclamation officials, CRITFC has requested that Reclamation consider examining a 10 foot drawdown of Banks Lake to allow about 500 kaf of storage for anadromous fish flow augmentation. An additional 250 kaf from a 10 foot drawdown, instead of a 5 foot drawdown described the DEIS, would increase the probability that target flows under the 2000 FCRPS Biological Opinion would be met. The DEIS did not include this alternative. We recommend that Reclamation examine this alternative and supplement the DEIS with this analysis.

¹ The CRITFC was formed in 1977 per formal resolution of the governing bodies of the four Columbia River treaty tribes: the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon and the Nez Perce Tribe. The Commission is comprised of elected and appointed tribal officials who are members of the respective tribal fish and wildlife committees. The Commission has technical and legal resources that provide assistance to the tribes in protecting and enhancing their federally reserved trust resources.

Reclamation has not formally consulted with CRITFC or its member tribes regarding possible alternatives for Banks Lake Drawdown. As all of the alternatives have the potential to impact federal trust resources, we urge Reclamation to conduct this consultation before the final EIS is issued.

02

The DEIS is incorrect when it states that the tribes are members of the Technical Management Team established by the 2000 FCRPS Biological Opinion (BiOp). CRITFC treaty tribes are not members of this forum, but offer technical input as the need arises. The DEIS should be modified to correct this error.

03

Specific Comments

- The DEIS fails to include non-BiOp river operations alternatives in Chapter 2 (p. 2-1) such as CRITFC's River Operations Plan, which include a full 10 foot drawdown. Four studies were run.² The 2000 Biological Opinion study is the same as the "No Action Alternative" listed in the EIS. The "BiOp-AA" study is the Action Alternative that describes the Biological Opinion operation with a draft at Banks Lake from full (1570 feet) down to elevation 1560 feet (260.8 KaF) assuming a uniform draft across August. The "BiOp-C" study is the Biological Opinion operation with CRITFC's preferred operation: a draft at Banks Lake from full (1570 feet) down to elevation 1560 feet (260.8 KaF), by July 31, then a draft down to elevation 1552 feet (178.5 KaF) by August 15, and a draft down to 1550 feet (54.9 KaF) by August 31. The "CRITFC" study is CRITFC's Natural River plan—altered flood control, earlier refill, and additional summer flow augmentation in order to replicate a naturally peaking (i.e., normative) river regime. The "CRITFC" study incorporates the 10 foot drawdown operation for Banks Lake.
- Results of the modeling (Attachment 1) show that summer flow targets at McNary would increase to benefit salmon by 1953 cfs (1% increase) with the BiOp-AA plan and 3864 cfs (2% increase) with the BiOp-C plan—all relative to the 2000 Biological Opinion. Lower Columbia spill would increase by 1108 cfs (1.4% increase) with the BiOp-AA plan and 2125 cfs (2.7% increase) with the BiOp-C plan—all relative to the 2000 Biological Opinion. The probability of meeting summer target flows would increase by 10% in July, 16% in Aug 1st–15th, and 10% for Aug 16th–31st with the BiOp-AA plan and increases of 12% in July, 20% in Aug 1st–15th, and 10% for Aug 16th–31st with the BiOp-C plan—all relative to the 2000 Biological Opinion.
- The draft EIS suggests that a generation loss would occur in the FCRPS under the BiOp-AA plan. Our modeling points to a different conclusion—a downstream system-wide generation benefit. Annual system-wide generation would increase by 266 MW with the BiOp-AA plan and 483 MW with the BiOp-C plan—all relative to the 2000 Biological Opinion. The generation revenue would increase by \$2 - \$19 million with the BiOp-AA

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² CRITFC performed analyses using the NPFC's GENESYS hydro-regulation model (version 2.6). This model is similar to its predecessor, HYDRO-SIM, which was presumably used for the EIS analysis.

plan and \$4 - \$39 million with the BiOp-C plan— all relative to the 2000 Biological Opinion.

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Conclusion

CRITFC appreciates the opportunity to comment on the DEIS. We recommend that Reclamation consult with the tribes regarding a full range of alternatives and incorporate our technical analyses for a 10 foot drawdown alternative for Banks Lake. This alternative and accompanying analyses should be provided in a supplemental DEIS. Should you have technical questions regarding these comments, please contact Kyle Martin at (503) 238-0667.

Sincerely,



Robert Heinith
Hydro Program Coordinator

Attachment 1

Banks Lake Drawdown Draft EIS

Attachment 1

*** EXECUTIVE SUMMARY OF GENESYS MODEL RESULTS***

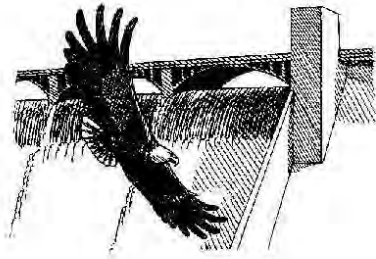
	2000BiOp	BiOp-AA	BiOp-C	CRITFC
<u>McNary 50-yr average flow (cfs)</u>				
Spring (April 10 - June 30)	269,837	269,877	269,887	281,901
Summer (July 1 - August 31)	180,970	182,923	184,834	185,375
Extra Summer (July 1 - Sept 30)	153,266	154,629	155,900	161,022
<u>McNary Lowest 11 Year Flows (cfs)</u>				
Spring (April 10 - June 30)	187,201	187,220	187,220	199,285
Summer (July 1 - August 31)	129,831	131,951	133,850	128,620
Extra Summer (July 1 - Sept 30)	114,555	115,988	117,268	116,846
<u>Total Spill: Forced + Bypass (cfs)</u>				
<u>Lower Columbia (MCN-BON)</u>				
Spring (April 10 - June 30)	121,330	121,349	121,351	127,366
Summer (July 1 - August 31)	80,161	81,269	82,286	80,048
Extra Summer (July 1 - Sept 30)	54,063	54,814	55,497	54,080
<u>Total Spill: Lowest 11 Years (cfs)</u>				
<u>Lower Columbia (MCN-BON)</u>				
Spring (April 10 - June 30)	85,889	85,897	85,897	89,244
Summer (July 1 - August 31)	50,933	51,903	52,810	50,175
Extra Summer (July 1 - Sept 30)	34,324	34,978	35,589	33,814
<u>Probability of Meeting Flow Objectives</u>				
<u>McNary (Summer = 195 kcfs)</u>				
July	50%	60%	62%	52%
Aug1-15	26%	42%	46%	28%
Aug16-31	4%	14%	14%	4%
<u>Retention Time (days), 50-yr avg.</u>				
<u>Summer (July 1 - August 31)</u>				
Grand Coulee	38.3	37.6	37.2	37.6
<u>Generation (MW)</u>				
<u>System-wide - 50 yr Average</u>				
Spring (April 10 - June 30)	17,291	17,295	17,296	17,013
Summer (July 1 - August 31)	14,204	14,319	14,427	13,711
Extra Summer (July 1 - Sept 30)	12,759	12,841	12,912	12,684
Annual Total (MW)	169,738	170,004	170,221	162,789
<u>Market Cost</u>				
1997 Prices, (relative to 2000 BiOp)	N/A	\$1,868,615	\$3,778,706	-\$115,211,096
1998 Prices, (relative to 2000 BiOp)	N/A	\$4,568,459	\$8,594,355	-\$83,337,222
2000 Prices, (relative to 2000 BiOp)	N/A	\$19,212,754	\$38,931,198	-\$51,431,361
<u>System - Lowest 11 Water Years</u>				
Spring (April 10 - June 30)	13,621	13,623	13,623	13,507
Summer (July 1 - August 31)	10,883	11,029	11,159	10,210
Extra Summer (July 1 - Sept 30)	10,240	10,340	10,427	9,925
Annual Total (MW)	134,342	134,659	134,925	127,191

GENESYS Hydro Model

March 7, 2003

CRITFC Hydro Program

COMMENT IO 06



Grand Coulee Dam Area Chamber of Commerce

P.O. Box 760
Grand Coulee, Washington 99133-0760
(509) 633-3074 or 1-800-COULEE2 (1-800-268-5332)

Jim Blanchard
Special Projects Officer
Ephrata Field Office
Bureau of Reclamation
Box 815
Ephrata, WA 98823

April 11, 2003

Re: Environmental Impact Statement, Banks Lake Drawdown

The Grand Coulee Dam Area Chamber of Commerce, fearing considerable economic damage resulting from a further August drawdown of Banks Lake, proposes an alternative that would both satisfy requirements for increased river flow and protect the families and businesses that depend on the recreation-based economy around Banks Lake.

The Chamber represents the business interests of the Grand Coulee Dam Area and is keenly aware of the impact the proposed further lowering of Banks Lake would have on the regional economy. The further lowering of the lake would render many boat launches unusable. And while all those still available would be in the Grand Coulee Dam area, our past experience with matters affecting tourism tells us that the cumulative impact of severely reduced boat access would spread the statewide perception that Banks Lake was entirely unusable.

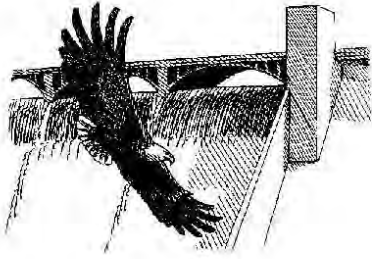
Coming in August, the busiest month of the season, it would devastate those businesses that must make the bulk of their income during that limited tourism/recreation window of three to four months. Tourism would plummet. Businesses, employment – and therefore families – would suffer.

Chamber members have worked hard over the last two decades to build the tourism industry because it is the area's best hope for economic development, due in no small part to the waters of Banks Lake. We seek a solution that would both provide for the perceived needs of endangered species far from here, and protect, perhaps even enhance, our efforts to keep our industry viable.

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Grand Coulee Dam Area – An Oasis In The Sun



Grand Coulee Dam Area Chamber of Commerce

P.O. Box 760

Grand Coulee, Washington 99133-0760
(509) 633-3074 or 1-800-COULEE2 (1-800-268-5332)

Simply put, we suggest both those ends would be served by simply taking more water from Lake Roosevelt without lowering Banks Lake. At full pool, that would require taking Lake Roosevelt down approximately one and a half feet over the course of the month, just inches a day. The Bureau can take Lake Roosevelt down by up to two feet in one day. The amount required to spare Banks Lake would not hinder BOR operations.

Such a reduction of the larger lake would be noticed only in that its many beaches would be enhanced at a time of year when they are sometimes largely inundated and less usable. Under such circumstances, lowering Lake Roosevelt a little could only help the regional tourism economy. This would be the case in most years.

The Grand Coulee Dam Area Chamber of Commerce urges the Bureau of Reclamation to consider this alternative, or any other that would avoid what would surely be an economically devastating management alternative of lowering Banks Lake to 10 feet below full pool.

Sincerely,

Tim Alling, President
Grand Coulee Dam Area Chamber of Commerce

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COMMENT IO 07



Electricity From Irrigation Water

GRAND COULEE PROJECT HYDROELECTRIC AUTHORITY

32 "C" Street NW, Room 305

P.O. Box 219, Ephrata, WA 98823-0219
509/754-2227 Fax: 509/754-2425

April 9, 2003

Mr. Jim Blanchard
Special Projects Office
BUREAU OF RECLAMATION
P.O. Box 815
Ephrata, Washington 98823-0815

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR
BANKS LAKE DRAWDOWN, WASHINGTON
REVIEW COMMENTS

Dear Mr. Blanchard:

The Grand Coulee Project Hydroelectric Authority (the GCPHA) was created and organized by the East Columbia Basin Irrigation District, the Quincy-Columbia Basin Irrigation District, and the South Columbia Basin Irrigation District (the Districts). On May 1, 1988, the GCPHA assumed the operation and maintenance responsibilities of the Districts' hydroelectric generating facility located at the south end of Banks Lake. The Districts use power revenues to fund efficient capital improvements to the federal reclamation facilities within the Columbia Basin Project.

The proposed action alternatives will impact the Main Canal Headworks Power Plant generation; thereby, decreasing available revenues to improve aging project infrastructure and requiring the Districts' power purchasers to acquire replacement capacity and energy. At \$36.65 per MWH, the fiscal impact range is \$19,100 to \$86,900. The \$86,900 figure is eleven percent (11%) of the estimated annual plant power revenues. The potential impact is significant to the Districts and its power purchasers.

Under separate mailings, the Districts are forwarding an analysis of the effects of flow augmentation from the Action Alternatives on the out-migration of ESA-listed salmonid stocks in the lower Columbia River (downstream of McNary Dam). Results indicate that the effect on fish survival would be infinitesimal – less than one fish for every ten thousand smolts. A copy of Districts' independent third-party technical review "EXECUTIVE SUMMARY" is attached for reference.

Under the Amendatory, Supplemental, and Replacement contracts between the United States and the Districts, Banks Lake is a portion of the project reserved works (works which

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To: Jim Blanchard
Subject: Draft Environmental Impact Statement (DEIS) for
Banks Lake Drawdown, Washington
Review Comments

April 9, 2003
Page 2 of 2

03

are common to all three Districts). Provisions of referenced contracts require the Districts to consult with the Bureau of Reclamation on the drawdown of project reserved works. For Banks Lake and other associated reserved works, scheduled drawdowns have been cooperatively planned and implemented between the Districts and the Bureau of Reclamation to achieve a project betterment and/or an O&M purpose. To minimize irrigation water delivery risks, the drawdowns are normally scheduled in the fall period.

The Districts' power sales agreements recognize the primacy of the Project's irrigation purpose and needs. Drawdowns and/or operations inconsistent with Project irrigation purposes and needs are actions subjecting the Districts, the Districts' water users, and the Districts' power purchasers to significant risk of loss. Any proposed drawdowns need to be prudently planned with the Districts to assess the potential risk of loss.

In 2001, the Bonneville Power Administration in cooperation with the Bureau of Reclamation implemented a voluntary energy load reduction program within the Columbia Basin Project on a willing seller basis consistent with state and federal laws. The irrigation buy-back program did impact the Districts' irrigation and power operations. Mitigation funds and replacement energy were provided by Bonneville to the Districts, the Districts' water users and the Districts' power purchasers.

The Districts would expect similar consideration from the Bureau of Reclamation's use of Banks Lake water for alleged ESA-listed salmonid purposes. The August drawdown will cause a significant decrease in power production, a significant decrease in power revenues for infrastructure improvements and a significant increase in risk of loss for the Districts, the Districts' water users and the Districts' power purchasers.

Sincerely,



Merle R. Gibbens
Secretary-Manager

Enclosure
cc: D. Erickson
K. Franklin
S. McDaniel

EXECUTIVE SUMMARY ONLY

**REVIEW OF DRAFT ENVIRONMENTAL
IMPACT STATEMENT ON THE
PROPOSED BANKS LAKE DRAWDOWN**

Prepared for

**East Columbia Basin Irrigation District
Quincy-Columbia Basin Irrigation District
South Columbia Basin Irrigation District
Grand Coulee Project Hydroelectric Authority**

Prepared by



TETRA TECH FW, INC.

April 2003



EXECUTIVE SUMMARY

On behalf of the East, South, and Quincy-Columbia Basin Irrigation Districts and the Grand Coulee Project Hydroelectric Authority (the Districts), Tetra Tech FW, Inc. (TtFW) reviewed and prepared comments on the Draft Environmental Impact Statement on the proposed Banks Lake Drawdown (draft EIS), which was prepared by the U.S. Bureau of Reclamation (Reclamation) in January 2003. The review focuses on the fish and flow issues related to the Proposed Action, which is the Reasonable and Prudent Alternative Action 31 (RPA 31) of the Biological Opinion (BIOP) for the Federal Columbia River Power System issued in December 2000 (NMFS 2000a). RPA 31 recommends study of an additional 5-foot drawdown of the lake level below the 1,565-foot level, which is 10 feet below full pool, during August.

A briefing on the main themes emphasized in the review comments is included in this Executive Summary. The Districts are concerned that the proposed 10-foot drawdown is certain to create adverse environmental and economic impacts, but is not certain to create any benefits. There are five main themes identified in this review:

- The No-Action Alternative is an action, and is different than current operations.
- Benefits to anadromous fish in the lower Columbia River were not demonstrated.
- The geographic scope of the resource impact assessments were inconsistent.
- The cumulative effects did not show the relative contribution of Banks Lake.
- Impacts to resident fish in Banks Lake were underestimated.

Issues related to each of the five main themes are summarized below. Because the draft EIS did not demonstrate benefits to fish in the lower Columbia River that could result from Banks Lake flow augmentation, an analysis of the potential benefits was conducted for this review using the CRiSP model. The model computed fish survival in the lower Columbia River for the 2000 BIOP. This scenario represented the baseline condition to which the various Banks Lake flow augmentation scenarios were compared. It is important to note that drawdown of the upper 5 feet of Banks Lake during August is included in the 2000 BIOP; therefore, the effects of this action, and all other flow augmentation RPAs implemented according to the 2000 BIOP, are included in the baseline condition. No other issues were further analyzed for this review, except to compare CRiSP-computed water velocities with actual measurements.

EXECUTIVE SUMMARY (CONTINUED)

No-Action Alternative

Reclamation considered the No-Action Alternative to be the 5-foot drawdown of Banks Lake, which was proposed under RPA 23 of the 2000 BIOP. The operation of Banks Lake under the No-Action Alternative is different than pre-2002 operations. The No-Action Alternative is not a true representation of no action because, historically, the lake in August has been above 1,565 feet 95 percent of the time. There is no assessment of this normal condition.

Additionally, there is no discussion in the draft EIS for the rationale behind the selection of a 5- and 10- foot drawdown. Reclamation does not present a master manual for the operation of the lake in the draft EIS. If such a manual existed, it would have provided a clear description of the No-Action Alternative. The selection of the no-action and action drawdown levels appear to be arbitrary. An analysis of the impacts of a lesser drawdown would provide better resolution of the change in impacts with drawdown below historical levels.

Lower Columbia River Anadromous Fish

The draft EIS lacked a demonstration of effects of fish in the lower Columbia River that would be derived from flow augmentation provided by a Banks Lake drawdown. The area that was to have been positively affected was not addressed in the draft EIS. This area is the lower Columbia River (downstream of McNary Dam). Reclamation focused the draft EIS on the immediate area surrounding Banks Lake. As part of this review, the effects of flow augmentation from the 10-foot drawdown of Banks Lake on fish survival in the lower Columbia River were analyzed. The CRiSP model was used for this analysis. The model results indicate that the effect on fish survival would be infinitesimal. Therefore, there is great uncertainty about the ability of the Proposed Action to achieve the intended benefit.

The following are the main points regarding the benefits of flow augmentation from a 10-foot drawdown of Banks Lake:

- The timing of the Banks Lake drawdown is such that most of the fish that would be intended to benefit from the flow augmentation would not be present in the lower Columbia River during the period of increased flows. The vast majority of the fish migrate through the lower Columbia River during June and July, but the drawdown would occur one month later, during August.

EXECUTIVE SUMMARY (CONTINUED)

- The benefits of any flow augmentation, in general, for the subyearling chinook salmon in the mid- and lower Columbia are in question based on recent analysis and interpretation of flow effects (ISAB 2003). The Independent Science Advisory Board (ISAB) (2003) stated that the assumption of proportional survival benefits of flow could not be supported. For subyearling chinook salmon in the mid-Columbia, ISAB indicated that no variable was found to correlate with migration speed. Additionally, ISAB did not believe that incremental flow as now mandated would result in “dramatic benefits” to inriver smolt survival.
- CRiSP model results indicate that none of the Banks Lake alternatives increase estimated subyearling chinook salmon survival, relative to the estimated survival of the 2000 BIOP, by more than 0.006 percent. This is an increase in estimated smolt survival of less than one fish for every 10,000 smolts beginning the migration.
- CRiSP model results indicate that fish travel time, another factor often considered important in survival, would not be affected at all in the reach between McNary Pool and Bonneville Dam for most simulations. But where effects were estimated, the reduction was typically about 14 minutes of travel time in this reach out of a total travel time of an estimated 6 to 9 days.
- The regional managers at the NPPC are considering flow changes, including deviations from the BIOP-recommended flows, that would be much greater than those proposed in the Banks Lake alternatives. These changes would result in reduced flow in the lower Columbia River reach during much of the period when juvenile subyearling chinook salmon would be migrating through this region, including part of August when Banks Lake flows are to be released. The current NPPC position is that these changes would be adequate to protect the anadromous endangered fish species of the Columbia River.

As part of this review, the impact of flow augmentation from Banks Lake drawdown on water particle travel time through the lower Columbia River was analyzed. The U.S. Geological Survey (USGS) computed discharge from measurements taken on the Columbia River downstream of The Dalles. Velocity measurements were comparable to the velocities computed by the CRiSP model, which verified the model estimates of velocity. Also, water particle travel time was estimated using reservoir data from the HEC-5Q model of the Columbia River. These estimates also verified the CRiSP model estimates of velocity and water particle travel time.

EXECUTIVE SUMMARY (CONTINUED)

Inconsistent Geographic Scope

The draft EIS is inconsistent in its treatment of the scope of the impacts. For the economic analysis, the area includes Grant County and the Federal Columbia River Power System (FCRPC) and five Public Utility Districts' hydro powerplants, but the fisheries analysis is limited to Banks Lake. The fisheries and water resources analyses should include the entire affected environment, which includes the lower Columbia River. There is no section in the "Affected Environment Chapter" of the draft EIS that describes water resources, and no section on the impacts to water resources, other than water quality in Banks Lake. A hydrologic report appears in Appendix C of the draft EIS, but it is not referenced in the main body of the document. Any EIS should address the resources that would likely be affected, either positively or negatively, regardless of their geographical location.

Cumulative Effects

There are two key issues related to cumulative effects: the contribution of Banks Lake to the total flow augmentation specified in the 2000 BIOP, and the latest ISAB opinion on the benefits of flow augmentation. As mentioned above, the ISAB has stated that the assumption of proportional survival benefits of flow could not be supported. The ISAB position obviously casts doubt on the usefulness of flow augmentation. Nevertheless, the other issue of relative contribution should have been addressed in greater detail in the draft EIS. There should be some quantification of the flow augmentation contribution of the other RPAs and a comparison to the Banks Lake contribution. In the draft EIS, Reclamation simply refers to the Banks Lake drawdown as a small but important piece of the total flow augmentation plan for the Columbia-Snake River system.

The CRISP model results showed the increase in fish survival in lower Columbia River due to Banks Lake flow augmentation relative to the cumulative effects of all of the flow augmentation RPAs implemented according to the 2000 BIOP. The model did not analyze the pre-2000-BIOP (no-action) conditions. A complete cumulative effects analysis would compare fish survival resulting from implementation of all other flow augmentation to that of implementing only the proposed Banks Lake drawdowns.

Furthermore, a complete analysis should show how the effects change farther downstream. By the time flow reaches the estuary, additional flow has entered the Columbia River from the John Day, Deschutes, Willamette and other rivers below Bonneville Dam, so that the relative contribution of any flow from Banks Lake would be diluted.

EXECUTIVE SUMMARY (CONTINUED)

Resident Fish

Resident fish and their associated habitat are one of the major resources that will be affected by the alternatives. In general, Reclamation describes the existing condition of a broad range of resources and potential impacts to these resources. However, it appears that the magnitude and risk of impacts to these resources may be more severe than characterized in the draft EIS. The main points of the review are noted below:

- The impacts that would result from the No-Action Alternative scenarios need to be discussed more fully. In several areas, the effects of these scenarios are not differentiated from historical operations (see Section 2 of this document).
- Some of the No-Action Alternative scenarios have the potential to adversely affect submergent and emergent vegetation compared to historical operations. These adverse affects would result from exposure of area where this vegetation grows from 21 to more than 30 days. This exposure would reduce any benefit to fish resources. Benthic resources, important as food for fish, would also be affected by "No-Actions," although at a lower level than would occur under the 10-foot drawdown associated with the Action Alternative scenarios.
- The Action Alternative scenarios pose a greater risk of adverse effects to lake fish resources. Some vegetation would be adversely affected, juvenile fish would be subjected to greater predation from a loss of habitat during a period of high-food demand, and the overall habitat area will be reduced, at least for the short term.
- The level of effects of the Action Alternatives on fish appears to be greater than noted in the draft EIS, as indicated by statements in the USFWS CAR report.
- Summary tables need to include the impacts of the No-Action Alternative scenarios as well as the Action Alternative scenarios.
- The proposed mitigation (e.g., studies of effects, use of hatchery, fish habitat enhancement) may not be adequate to offset impacts.

There is one final issue, which primarily relates to resident fish, but it also is important to other resources within Banks Lake. The issue is the duration of drawdown. The duration is directly proportional to the amount of impact. The draft EIS indicates a range of target dates for refilling the lake: from early September to late November. The impact of longer durations should be addressed in the final EIS.

COMMENT IO 08



Grant County Economic Development Council

6594 Patton Blvd. N.E., Moses Lake, Washington 98837 Phone 509-764-6579 Fax 509-762-5161

March 31, 2003

Mr. Jim Blanchard
Bureau of Reclamation
P.O. Box 813
Ephrata, WA 98823-0813

Re: Banks Lake Drawdown, Grant County, Washington, Draft EIS

Dear Mr. Blanchard:

As Executive Director of Grant County Economic Development Council (EDC), I have been asked to respond with the Council's comments and concerns regarding the Draft EIS for the Banks Lake Drawdown, Grant County, Washington

Grant County EDC is a Washington corporation based in Grant County. The EDC is funded by public and private sector members that believe in the ideals and goals of the EDC and in the importance of the work we do. The sole purpose of the council is improving the economy of Grant County. We monitor income and employment levels in Grant County as well as the number employed among the various sectors in our local economy. We also monitor the local government tax revenues (sales tax and property tax) and consider all of these indicators important for the analysis of our current and future economic condition.

We focus on business retention and expansion issues as well as business recruitment opportunities. We work closely with local and state government agencies to plan and implement strategies that will improve our economy. The impacts of our efforts are recognized, understood, and appreciated locally, regionally and often as far away as Olympia. While we are focused on our local economy, the economy of the region, the state and the nation are important and contributing factors to our success or decline.

We believe that a diversified economic model is the best for our community. That said we certainly recognize that there are certain communities and regions within Grant County that are subject to far less diversification than the County as a whole. That is very true of the northern one-third of our County. Agriculture and government are the primary sectors for employment, and those sectors are not expanding in that area.

In a number of the small rural towns that make up that section of our County, tourism is a definite economic engine. From Soap Lake to Coulee City and beyond to Electric City and Grand Coulee and Coulee Dam, the majority of the regions retailers and service sector establishments depend on tourism for the major portion of their revenues. Those revenues are for the most part seasonal (June thru August) and are not expanding.

It is well recognized that the majority of the tourists visiting the north end of Grant County come to enjoy the warm waters of the lakes and the sunshine and open space that is available in most areas of the region. Banks Lake is a favorite vacation and short-term destination for fishermen, boaters, and swimmers alike during the summer season. The proposed draw down will severely limit the opportunity for those people to access and use the lake with boats and the known beaches will be little more than mud flats.

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Mr. Jim Blanchard
March 31, 2003
Page 2

If boating and fishing are reduced, area lodging and restaurant establishments will see a major decline of revenue in the height of the tourist season, which is the peak revenue period for those types of businesses. The resulting impacts would be devastating to an already sagging economy.

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We urge that you reconsider the negative economic impacts of the proposed drawdown on local and regional businesses and communities.

In addition, we are very concerned with the long-term risks that the proposed drawdown would have on the farmers who depend on the Columbia Basin Project (CBP) for water. If a mechanical or electrical emergency at Grand Coulee Dam or the pumping station were to occur during or after the drawdown it could impact the flow of water to farmers at a time when it is needed most.

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Banks Lake was originally constructed as an integral part of the CBP and we believe the primary purpose of the reservoir is to supply the CBP with water for irrigators. Farmers are suffering low incomes for a variety of reasons including low export volumes, low commodity prices, increasing costs of labor, fuel, and other inputs and the increasing costs of imposed regulations. Farmers should not be faced with the increased risk of water shortages.

We urge you to consider an alternative approach to increase Columbia River flows at McNary Dam during the juvenile out-migration of ESA-listed salmon stocks. We respectfully urge that the drawdown be made in Lake Roosevelt. That pool would be reduced approximately one and one half feet from normal levels at that time of year proposed for the drawdown. We believe that the impacts of a drawdown on Lake Roosevelt would be negligible compared to the impacts of a drawdown of Banks Lake.

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This alternative deserves study and strong consideration as the optimal solution to enhance flows in the Columbia River during the desired period.

There is far too much at risk and far too little in reward for the Banks Lake Drawdown to occur as planned. Please keep us informed of your progress in this very serious matter by notifying us at the above listed address when the final EIS is available so that we may pick a copy for our review.

Thank you for your consideration of our concerns and suggestions.

Sincerely,

Terry L. Brewer

Terry L. Brewer, CECD
Executive Director

Cc: Senator Murray
Senator Cantwell
Congressman Hastings

COMMENT IO 09



January 27, 2003

Jim Blanchard
Special Projects Officer
US Bureau of Reclamation
32 C Street, Box 815
Ephrata, WA 98823

Dear Mr. Blanchard,

The Grant County Tourism Commission supports the concern voiced by the Grant County Commissioners as the economic impact of the additional 5 feet drawdown of Banks Lake Reservoir is addressed.

Grant County Tourism concerns include lake access issues, fishing, habitat projects, swimming, family recreation and other recreational opportunities. We encourage you to recognize that tourism is a leading industry for the county and can be damaged economically at such a significant time of the year. Tourism is also an environmentally friendly and clean industry that should be promoted, not hindered.

We further request that mitigating funds be considered and encouraged in the event of the existence of a negative economic condition. We appreciate your time in reviewing our concerns regarding the Banks Lake drawdown.

Sincerely,

A handwritten signature in black ink, reading "Trina Sanders".

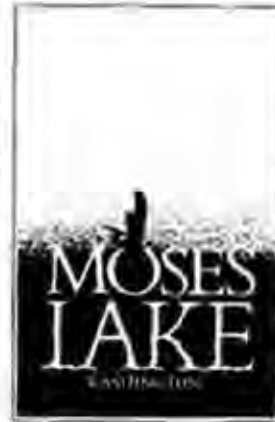
Trina Sanders, Chair
Grant County Tourism Commission

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COMMENT IO 10

Moses Lake Area
CHAMBER of COMMERCE
324 SOUTH PIONEER WAY • MOSES LAKE, WA 98837-1737
509.765.7888



March 31, 2003

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street
P.O. Box 815
Ephrata, WA 98823-0815

Dear Mr. Blanchard:

The Moses Lake Area Chamber of Commerce by unanimous vote of the Board of Directors is in opposition to the proposed Banks Lake drawdown. The draft Environmental Impact Statement (EIS) states, "The purpose of the proposed action is to enhance the *probability* of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed salmonid stocks..." (italics added). The 130,000 acre feet of water from Banks Lake in late summer represents no more than a probability of meeting flow objectives. In other words, the need for the Banks Lake water is speculation, not established fact.

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Conversely, it is established fact that a five-foot drop in Banks Lake will render 10 of 12 boat launches unusable on Banks Lake. The tourism income to communities in the area will be negatively impacted by the inaccessibility of the lake. This is unacceptable and shows disregard for the fragile economies of the Columbia Basin that rely heavily on tourism in the summer months.

02

The drawdown also threatens agricultural viability in the Columbia Basin by setting a dangerous precedent. The diversion of water from Banks Lake (an agriculture irrigation reservoir) to a use that is speculative in the value it will bring to juvenile fish survival opens the way for irrigation water curtailment, particularly in low river flow years. This precedent-setting drawdown of a reservoir in the Columbia Basin Reclamation Project portends a disregard for the value of agriculture in the Columbia Basin. As demonstration of this value, it is noteworthy that the Columbia Basin produces more tons/acre of potatoes than any other growing region in the world. According to a study done by Washington State University in 1996, the potato industry alone directly and indirectly generates over \$3 billion of sales throughout the Washington State economy. It is poor policy to implement practices that threaten such vibrant economic activity, especially when the policy is not backed by sound scientific data.

03

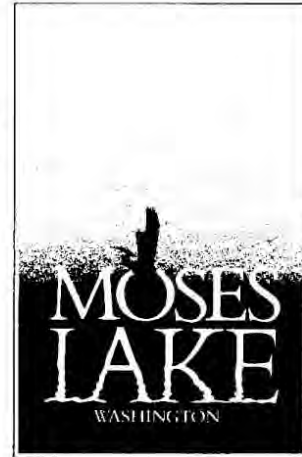
Sincerely,

A handwritten signature in black ink, appearing to read "Keith Baldwin".

Keith Baldwin
President

COMMENT IO 11

Moses Lake Area
CHAMBER of COMMERCE
324 SOUTH PIONEER WAY • MOSES LAKE, WA 98837-1737
509-765-7888



April 04, 2003

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C. Street
P.O. Box 815
Ephrata, WA 98823-0815

RE: Banks Lake Drawdown

Dear Mr. Blanchard:

The Response Team, a committee of the Moses Lake Chamber of Commerce, is composed of leaders in the Moses Lake community. The mission of the Response Team is to understand and study issues having an impact on our area. By unanimous vote we oppose the proposed Banks Lake drawdown.

01

The need for the Banks Lake water is speculation, not established fact.

The drawdown will have a profound negative affect on Grant County and communities near Banks Lake. The proposed drawdown will make the lake all but inaccessible which will result in a severe negative economic impact.

02

Banks Lake is an agriculture irrigation reservoir, the diversion of water from Banks Lake to a use that is speculative in the value it will bring to juvenile fish survival opens the way for irrigation water curtailment. The drawdown shows a direct disregard for the value of agriculture in the Columbia Basin. It is poor policy to implement practices that threaten two such vital economic activities, especially when the policy is not backed by sound scientific data.

03

Sincerely,

Dean Kastinas
Chairman, Moses Lake Response Team

w

COMMENT IO 12

March 31, 2003

Jim Blanchard
Special Projects Officer
Bureau of Reclamation
32 C Street
P.O. Box 815
Ephrata, WA 98823-0815

Dear Mr. Blanchard:

The Moses Lake Area Chamber of Commerce by unanimous vote of the Board of Directors is in opposition to the proposed Banks Lake drawdown. The draft Environmental Impact Statement (EIS) states, "The purpose of the proposed action is to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed salmonid stocks..." The 130,000 acre feet of water from Banks Lake in late summer represents no more than a probability of meeting flow objectives. A drawdown based on speculation is not worth the risk to the local and regional economy.

01

A five-foot drop in Banks Lake will render 10 of 12 boat launches unusable on Banks Lake. The tourism income to communities in the area will be severely impacted by the inaccessibility of the lake. This is unacceptable and shows disregard for the fragile economies of the Columbia Basin that rely heavily on tourism in the summer months.

02

The drawdown also threatens agricultural in the Columbia Basin by setting a dangerous precedent. The diversion of water from Banks Lake, an agriculture irrigation reservoir, opens the way for irrigation water curtailment, particularly in low river flow years. This precedent-setting drawdown of a reservoir in the Columbia Basin Reclamation Project indicates a disregard for the value of agriculture in the Columbia Basin. The Columbia Basin produces more tons/acre of potatoes than any other growing region in the world. According to a study done by Washington State University in 1996, the potato industry alone directly and indirectly generates over \$3 billion of sales throughout the Washington State economy. It is poor policy to implement practices that threaten such vibrant economic activity, especially when the policy is not backed by sound scientific data.

03

Sincerely,



P. J. De Benedetti
Moses Lake Chamber of Commerce
Vice President – Community Development

COMMENT IO 13



....Working to enhance economic vitality in the Pacific Northwest since 1934

April 10, 2003

Jim Blanchard, Special Projects Officer
U.S. Bureau of Reclamation
32 C Street, PO Box 815
Ephrata, WA 98823-0815
jblanchard@pn.usbr.gov

PNWA opposes Banks Lake drawdowns for Columbia River flow augmentation (Comments on Banks Lake Drawdown DEIS)

I am writing to express the views of the Pacific Northwest Waterways Association. Active since 1934, our membership includes over 100 public and private sector organizations engaged in economic development activities in Washington, Oregon and Idaho.

We oppose drawing down of Banks Lake to provide water for Columbia River flow augmentation. We believe the negative economic impact throughout the Columbia Basin far outweighs the miniscule benefit that potentially derives for fish. We foresee other negative effects on local fish and wildlife, recreation, energy production, and the rural communities that rely on recreation and agriculture for their economic health.

We urge the Bureau of Reclamation to operate Banks Lake as it has traditionally been operated to meet its original intended purposes.

Thank you for your attention to our concerns.

Sincerely,

Glenn Vanselow
Executive Director

01

COMMENT IO 14

Quincy Valley Chamber of Commerce

PO Box 668
Quincy, WA 98848
509 787-2140

March 21, 2003

Jim Blanchard
Special Projects Officer
US Bureau of Reclamation
32 C. Street, Box 815
Ephrata, WA 98823

Dear Mr. Blanchard:

The Quincy Valley Chamber of Commerce supports the concern voiced by the Grant County Commissioners as the economic impact of the additional 5 feet drawdown of Banks Lake Reservoir is addressed.

The Quincy Valley Chamber of Commerce, which represents Quincy, Crescent Bar, George, Winchester, and Sunland Estates, is concerned about the effect the drawdown will have on irrigation of farmland, lake access issues, fishing, habitat projects, swimming, family recreation and other recreational opportunities. We encourage you to recognize that agriculture and tourism are the leading industries in Grant County and would be damaged economically by the drawn down and the effects that would follow by doing the draw down in August.

We further request that mitigating funds be considered and encouraged in the event of the existence of a negative economic condition. We appreciate your time in reviewing our concerns regarding the Banks Lake drawdown.

Sincerely,



Lisa Karstetter
Executive Director
Quincy Valley Chamber of COmmerce

01

02

COMMENT IO 15



SAINT ANDREWS GRANGE

NO. 832

37340 Rd J-3/10 NE
COULEE CITY, WA 99115
(509) 632-5514



March 26, 2003

Mr. Bill Blanchard:

The St. Andrews Grange strongly opposes the draw down of Banks Lake.

The town of Coulee City depends on tourism for much of its business. The Coulee City Community Park is a popular recreational area for boating, fishing, swimming and camping. The 10-foot draw down would make it unusable during its busiest time of August and September.

The benefit to salmon in the Columbia River is unknown, the effect on human lives is known. The Draft EIS disregards the potential loss of business to the area.

The fish in Banks Lake will be affected by disrupting the hatches according to history with previous drawdowns.

The draw down would cause additional strain on an already stressed community that supports a depressed Agricultural industry.

Sincerely,

Betty Jorgensen - Sec.

Betty Jorgensen
Secretary
Saint Andrews Grange No. 832

Cc. EPA, Governor Gary Lock

01

COMMENT IO 16

BANKS LAKE ENHANCEMENT PROGRAM RESPONSE TO BANKS LAKE DRAWDOWN DRAFT EIS JANUARY 2003

Given the numerous complex issues related to draw downs, our response will address concerns relating to environmental impacts only. Concerned organizations, business owners and individuals have extensively detailed the impacts relating to short-term economic and recreational assets. That said however, the long term environmental health of Banks Lake will directly affect the regions ability to continue growth in the recreational arena.

The action alternative of the draft EIS proposes four draft scenarios designed to reach elevation 1560 at various times in August. Refill for all is projected to reach elevation 1565 by September 10th. Under these proposals, water level would remain below 1565 for 19 to 41 days dependent on selected scenario. Elevations 1560 would be maintained for 10 to 21 days dependent.

Because there is no guarantee of which scenario will be selected, we must assume the worst case for consideration. The Banks Lake Enhancement Program does not support water level at elevation 1560 for 21 days in August.

The EIS indicates that the impact on juvenile fish would be "minor" and would not have an adverse effect on these fish. However, recent ongoing studies of Banks Lake indicate the lake has low populations of zooplankton, invertebrates and diptera. Also, poor recruitment of black crappie, bluegill, pumpkinseed, largemouth bass and walleye are indicated.

At this juncture, exposing an additional 5 feet below 1565 elevation is not a minor impact to species still recovering from the 1994/1995 28 foot draw-down.

The US Fish and Wildlife Service report for the proposed 10foot drawdown echoes these concerns. To reduce these critical shallow habitats by 50% beyond normal operating levels cannot be assumed to be minor in their impact.

The reduction of available submergent covers and vegetation is not linear with the percent of water removed. A small percentage of submergent vegetation exists below 1560 elevation. Additionally, rock and cobble areas are often heavily silted at these depths providing little escape cover for juvenile fish and invertebrates.

01

02

In general, insufficient current studies have been conducted to establish a clear understanding of the impact of the Action Alternative. Current ongoing studies are a step in the right direction. Their work must be continued to develop a clear understanding of the action /effect on this system.

02

The Banks Lake Enhancement Program supports the No Action Alternative. Science and History demonstrate that summer drawdowns to 1565 elevation will provide numerous positive benefits if maintained for at least 120 days. Maintaining 1565 elevation until March of the following year yields even more benefits. These benefits are defined on page 345 of the Banks Lake Enhancement Program Master Plan issued in amended form in February 1998. [See enclosure No. 1]

03

We strongly urge the concerned parties to consider these actions regardless of which alternative is pursued. It should not be allowed that the minuscule effects on power generation profits should prevail over the undeniable benefits of this proposed plan.

04

Respectfully,

 3/3/03
Louis C. Nevsimal
Washington State B.A.S.S. Federation,
Banks Lake Enhancement Program Director

WATER LEVEL CONTROL PROGRAM

04

Aquatic vegetation is a critical part of any healthy aquatic environment. Banks Lake, like many western canyon style systems, is strongly dependant on aquatic vegetation beds and their associated biomass. Aquatic vegetation controls will produce an improved fisheries habitat by:

- Providing juvenile fish with rearing areas;
- Provide improved insect biomass;
- Reduce wave/current erosion;
- Capture and retain water born nutrients;
- Enriches system thru normal nutrient cycling;
- Reduce fluctuations of dissolved oxygen levels;
- Reduce fluctuations of Ph.. levels;
- Provide predator ambush cover; and
- Provide deep offshore winter habitat.

In addition, Aquatic vegetation would benefit waterfowl and wildlife throughout the Banks Lake system.

The enclosed water level management table would provide the following benefits:

- Full pool from ice out till early July to ensure adequate stability and structural availability to maximize prey species recruitment;
- Tapering draw down to full pool (FP) minus 3' by end of July allows fish to adapt to water level change, enlarges beach areas during summer tourist peak and facilitates riparian vegetation growth offshore;
- Tapering draw down to FP minus 5' at end of October exposes shallow vegetation to migrating waterfowl, and holding this level through winter until ice out will freeze out shallow aquatic vegetation providing "clean" beaches, boat ramps, and reduce surface matting of aquatic vegetation in addition, minus 5' will prevent ice scouring of riparian areas and reduce wind, wave and ice shoreline erosion issues.

We strongly request BR and WSF&W consider this proposal for implementation. The benefits of and environmentally sound water level and vegetation control plan could allow Banks Lake to reach and maintain it's maximum productivity potential. The environmental and economic benefits of this action would be positive and profound.

05

Federal Agencies—Regional or Local Levels — FA

Responses to Comments

The table on page 5 provides the list of those commenting in distribution list order, with the page number of the comment document and the first page of the response shown in the table. The responses to the comments follow here.

FA Federal Agencies

FA 01 01

An extended refill was evaluated, but impacts were considered to be too severe, and, therefore, it was not carried forward into detailed studies. See the “Alternatives Considered but Eliminated” section in chapter 2.

FA 01 02

Document was changed. References to “anadromous fish under ESA” have been changed to “Snake River juvenile fall chinook.”

Your suggestion pertaining to survival of Hanford Reach juvenile fall chinook was considered but determined not to be part of the purpose and need of this action.

FA 01 03

The Biological Opinion for the Operation of the Federal Columbia River Power System (NMFS 2001) has been incorporated by reference into this EIS. Additional citations have been added to the T&E section of Chapter 4 to incorporate this additional reference material.

FA 01 04

Power studies have been redone to show monthly impacts. Power rates provided by BPA indicate that August energy cost is less than September energy cost. To assess incremental benefits, it is necessary to compare the Action Alternative to the No Action Alternative. Please see chapter 4, Economics section, Hydropower Resources.

FA 01 05

See response to FA 01 02.

FA 01 06

See response to FA 01 02.

FA 01 07

Changes were made as requested in this comment.

FA 01 08

Document has been corrected.

FA 01 09

Changes were made in the text as suggested.

FA 01 10

Document has been corrected.

FA 01 11

See response to FA 01 02.

FA 01 12

Changes were made in the text.

FA 01 13

The section was rewritten and much of the original text was deleted.

FA 01 14

Changes were made in the text as suggested.

FA 01 15

See response to FA 01 03.

FA 01 16

Changes were made in the text.

FA 01 17

See response to FA 01 03.

FA 02 01

The new tables have been included in the report. See also FA 01 01.

FA 02 02

Removal of warm water from FDR Lake through the use of Banks Lake pumping facilities has been suggested as a means of cooling downstream releases to the Columbia River. This project is not expected to substantially change the potential use of Banks Lake pumping facilities for managing the temperature of Grand Coulee releases to the Columbia River downstream. Modeling tools to evaluate this option are not currently available.

FA 02 03

See response to FA 02 01.

FA 02 04

See text for a revised analysis.

FA 02 05

There are no downstream dams from Banks Lake; all water is utilized in the irrigation system of the Columbia Basin Project. Return flows from the CBP are delayed long enough to be unpredictable from a temperature standpoint in the Columbia River. Even though several water bodies within the CBP have been listed for temperature exceedence, water temperature is not a problem for the irrigators using CBP water. In fact, during certain times of the year, the temperature is an advantage. Releases of water from Banks Lake to the irrigation delivery system does not affect the Columbia River.

FA 03 01

No response required.

FA 04 01

No response required.

Indian Tribes — IT

IT Indian Tribes

IT 01 01

Information has been included in the Historic Resources discussion in Chapter 3, under Prehistoric Sites.

IT 01 02

Language in the EIS in Chapter 3 recognizes this statement.

IT 01 03

Reclamation has met with and will continue to meet with history/archaeological program of the CCT.

IT 01 04

Reclamation modified text by adding the word “annually” to the Action Alternative drawdown description to further clarify the intent of a possible annual drawdown to water surface elevation 1560 feet.

IT 01 05

The EIS have been updated as suggested in this comment.

IT 01 06

The use of “historic register” is intentional because one of the properties is on the Washington State Inventory of Historic Places and not the National Register. In addition, the text was modified in Chapter 4, Historic Resources, under “Mitigation,” that historic resources are eligible for the historic register unless determined ineligible.

IT 01 07

Reclamation treats the outline and narrative as one document since they were prepared under one subcontract.

Reclamation believes there is a balance between describing and identifying TCPs while respecting site confidentiality in accordance with the laws.

IT 01 08

The second paragraph under “Alternatives Considered in Detail” describes the conditions when Reclamation would not draw down Banks Lake.

IT 01 09

This final EIS reflects current information not available for the DEIS in Chapter 3, Historic Resources section.

IT 01 10

Reclamation has incorporated this information in the final EIS.

IT 01 11

TCPs are a class of historic properties considered under the National Historic Preservation Act and, as mentioned in Chapter 5 of the DEIS, Reclamation recognizes the need for additional consultation.

IT 02 01

Text has been added to chapter 4 in the Vegetation, Fish, and Wildlife section to respond to this comment.

IT 02 02

The impacts analyzed in this EIS are specifically limited to those that would occur directly to the Banks Lake biota. In response to this comment, however, additional information has been added to chapter 4 to address FDR Lake biota, including fish.

IT 02 03

FDR Lake (FDR Lake) is to be at water surface elevation 1283 feet by September 30. Refill of Banks Lake does not change that goal. To refill Banks Lake by September 22, downstream flows will be reduced. Reclamation will continue to target water surface elevation 1283 for the end of September.

Congress and Washington Legislature — CO

CO Congress and Washington State Legislature**CO 01 01**

The analysis of effects to listed threatened and endangered anadromous species is now addressed in the EIS by incorporating by reference the Biological Opinion 2000.

CO 01 02

The economic effects of the drawdown have been reevaluated using the data supplied by Grant County and other sources. One major consideration in developing the final estimate of economic effect is that impacts to recreation, which is a major economic factor in the Banks Lake area, would not be as severe as local interests anticipated.

Water-based recreation is one of the most sought after types of recreation in the United States, based on numerous studies about desired recreation facilities. As the water level drops and the esthetics change, the types of recreational use may change. However, the reservoir is still a desirable facility and access would be maintained through mitigation. The National Park Service made a similar determination in their Final General Management Plan/Environmental Impact Statement for FDR Lake National Recreation Area in January 1999.

Mitigation has been proposed to address the recreation impact by extending boat ramps and ensuring that certain recreation facilities function during times of low water. The short duration mud flat and occasional rock that a boat can hit are short-term impacts at many reservoirs during normal operations.

Because of these mitigation actions, recreation would not be severely affected at Banks Lake. Banks Lake would still have more than 20,000 surface acres of water for public use and working facilities, which includes access to the water that would enable the public to use the recreational resources in and around the reservoir.

The local economy at the north end of Banks Lake is based as much on the utility sector, including employment at Grand Coulee Dam and Powerplants, as it is on recreation. The utility portion of the economy is strong, would not be affected by drawdown, and is a year round source of economic strength. The impacts on the economy of the North Grant County area are further demonstrated by the fact that Banks Lake related recreation is a seasonal business, with most of its employees being only temporary hires. The loss of these positions would be less disruptive than the loss of year-round jobs.

An examination of U.S. Census Bureau employment data for the year 2000 shows that the economy in the North Grant County area accounted for only 5.4 percent of the total employment in the county. In addition, the local North Grant County economy is more diversified than commonly thought (see table 3-6 in the report).

These employment data indicate that recreation related industries, including the categories of Arts, Entertainment, Recreation, Accommodations, and Food Services account for only about 12.4 percent of the employment. Retail trade employs about 11.2 percent—some of which may be recreation related. Other non-recreation sectors account for more than three-fourths of the jobs in North Grant County. Employment in recreational related industries in the North Grant County area is, on a percentage basis, somewhat more important in this area than it is for Grant County as a whole (12.4 percent verses 6.9 percent).

CO 02 01

The analysis included in the EIS indicates that neither alternative would affect water supply delivery on the Columbia Basin Project for agricultural users. Reclamation has retained flexibility in management. Refer to the section on Alternatives Considered in Detail.

CO 02 02

See response to CO 01 02.

CO 02 03

See response to CO 01 02.

CO 02 04

While Reclamation will attempt to comply with recommendations by Washington State and local governmental entities, ultimate responsibility for compliance with Federal Law, including the Endangered Species Act and contractual obligations related to the Columbia Basin Project, resides with Reclamation. Reclamation administers the CBP in compliance with state law but must also comply with the Endangered Species Act and the Biological Opinion issued by NOAA Fisheries. If the State of Washington does issue an opinion on flows that can be utilized by Reclamation in the Record of Decision for this EIS, that information will be considered.

State and Local Government Agencies — SL

State and Local Government Agencies — SL

SL State and Local Government Agencies

SL 01 01

Spills to enhance salmon migration at downstream facilities would continue to be managed to comply with Washington total dissolved gas standards as modified to accommodate salmon recovery efforts.

Text was modified in chapter 4 section on water quality, pages 115 and 116, last paragraphs.

SL 01 02

Tools to evaluate the effects of increased drawdown on downstream temperatures in the Columbia River are not available at this time. See also response to SL 01 01.

SL 01 03

There are two things that affect power revenues; one is the difference in power rates at different times of year, and the other is the difference in spill requirements at different times of year. During the drawdown period (August), some projects are required to spill a percent of their flow; however, during the refill period, there is no spill requirement. As such, there is a change in the amount of water used to generate power.

SL 01 04

Banks Lake has no role to play in the TMDL for the Columbia River. The drawdown would affect only the timing of withdrawals for the Columbia Basin Project, not the total amount of water removed from the river. Since few impacts to water quality are foreseen based on the existing data, development of a model was beyond the scope needed for this evaluation. See also response to FA 02 02.

SL 01 05

This statement was deleted from the final EIS and new material is in its place. Although the fate of total dissolved gas in Banks Lake has not been studied, and is largely unknown, no dissolved gas is generated as a result of the proposed project. Further, the proposed September refill period for Banks Lake occurs when total dissolved gas levels in the Grand Coulee forebay are in compliance with state and tribal water quality standards. Potential effects on dissolved oxygen are unknown. Although temperature effects may tend to reduce dissolved oxygen levels, the lower pool levels would enhance wind mixing and associated reaeration.

SL 01 06

See response to SL 01 05.

SL 01 07

No specific data are available. However, the quantity of groundwater entering or exiting the Sun Lakes system during a 1-month drawdown of 10 feet would be minimal.

SL 01 08

With the exception of lands in Section 16, T.28 N. R. 30 E. and some additional State held lands under the water surface, all lands within the study area are federally held lands and not subject to State or local jurisdiction. Reclamation strives to accommodate the wishes of local governmental entities in relation to the decisions Reclamation makes on Reclamation held lands, but if there are conflicts between mandated uses of Federal lands and those local wishes, Reclamation will meet our obligations to Federal law and regulation. Past requests for review and permitting of facilities within state managed areas have been made by state agencies without agreement from Reclamation as to the need for such permits. Reclamation will modify the EIS to include the SMP for Douglas County.

As noted in your comment, federally funded activities on federal properties are exempt. Boat launch extension activities are federally funded and, therefore, exempt.

SL 01 09

Adverse impacts to riparian vegetation are not expected; the environmental consequences to vegetation are described in Chapter 4, Vegetation. Also, this EIS was not intended to address any enhancement of riparian vegetation.

SL 01 10

The RMP is scheduled for review and amendment in 2011 and no impacts from informal camping under this action have been identified. The informal camping activities are not expected to change as Reclamation does not anticipate that the portions of the reservoir bottom that will be exposed will be inviting to recreationists.

SL 01 11

Reclamation is responsible for mitigation of impacts on Federal lands and will work in cooperation with managing partners.

SL 01 12

The proposed action is a Federal action taking place on Federal property and, as such, is not subject to the Shoreline Management Act. However, cultural and historic resources are being evaluated for compliance with Federal law.

SL 01 13

There are three important littoral zone habitats identified in the DEIS that would be subject to drawdown impacts: shallow emergent vegetation; shallow

unvegetated flats; and the boulders, cobbles, and gravel. All of these shallow habitats are important for fish species in Banks Lake. Regarding the importance of unvegetated flats, page 3-16 of the DEIS states that the two key shallow unvegetated flats identified in the Banks Lake RMP are just south of the Million Dollar Mile North Boat Ramp and are used by smallmouth bass. The flats east of Barker Flats are used by largemouth bass, sunfish, and black crappie. These shallow unvegetated flats are not the result of “upper zone” drawdown. The characteristics of these flats are due to the clay substrate, the exposure to wave action, and the underlying gentle topography. The analysis of impacts focuses on the impacts to three important littoral zone habitats rather than dividing the impact area into an “upper zone” and a “lower zone.”

The normal September water surface elevations typically fluctuate from elevation 1565 feet to 1570 feet. The reservoir will be refilled to be within its normal operating levels by September 22.

A description of the various types of substrate is in the introductory paragraphs of chapter 3, Vegetation, Fish, and Wildlife.

Adverse impacts to riparian vegetation are not expected; thus, mitigation is not proposed.

SL 01 14

As used in the DEIS, the definition of aquatic emergent vegetation follows that used by the National Wetland Inventory of the U.S. Fish & Wildlife Service. Emergent vegetation is defined as erect rooted, herbaceous wetland plants excluding mosses and lichens. These are the plants that would be directly affected by reservoir drawdowns, and provide most of the substrate used by spawning and rearing fish. A more accurate term is “aquatic macrophyte.” Aquatic macrophytes by definition are the macroscopic (that is large enough to be seen with the unaided eye) forms of aquatic and wetlands plants found in the shorelines of lakes or slow-moving reaches of rivers.

There are four widely-recognized growth forms: emergent, submersed, floating-leaved, and free-floating. Emergent macrophytes are rooted in substrate with the tops of the plant extending into the air. Common emergent macrophytes include plants, such as reeds (*Phragmites*), bulrushes (*Scirpus* spp.); cattails (*Typha* spp) and spikerushes (*Eleocharis* spp). Submersed macrophytes grow completely submersed under the water and include such diverse species as pondweeds (*Potamogeton* spp) and Eurasian watermilfoil. Floating-leaved macrophytes are rooted to the lake bottom with leaves that float on the surface of the water. They generally occur in areas of a lake that do not dry out periodically. Typical species are waterlilies (*Nymphaea* spp), spatterdock (*Nuphar* spp), and watershield (*Brasenia*). Free-floating macrophytes are plants that float on or just under the water surface with their roots in the water and not in sediment. Duckweed (*Lemna* spp) typifies this growth form. The text of the document has been revised

to reflect the use of the more-encompassing term “aquatic macrophyte” in place of aquatic emergent vegetation.

SL 01 15

Resources monitoring is ongoing under an existing Resources Management Plan.

SL 01 16

The drawdown from water surface elevation 1570 feet to 1565 feet might affect cottonwoods, but the additional 5-foot drawdown from elevation 1565 feet to 1560 feet would not additionally affect cottonwood. The proposed action has no effect on cottonwood; however, as part of an overall plan to improve resources from ongoing operations, this resource will be reviewed.

Mitigation for cottonwood is not proposed as part of this action.

In addition, the agricultural lease at Steamboat Rock was reviewed during the Resource Management Plan process for Banks Lake; it was determined to be beneficial and a proper use of the area. There are no current plans to change that decision.

This action is outlined in the Banks Lake RMP and will take place in the future.

SL 02 01

On table 4.4, “State” was inadvertently substituted for “Federal.” This has been corrected in the text. The Chelan rockmat is a Federal species of concern, as well as State threatened species, and is the only State plant species that exists within the Banks Lake project area. It has been addressed in this DEIS. Other state special status plant species are outside the Banks Lake drawdown zone and are not addressed in this EIS.

SL 03 01

See response to CO 02 01.

SL 03 02

“Baseline” is not a term used in NEPA compliance documentation. NEPA analysis is based on future with and without the project.

The “No Action Alternative” is considered to be the action most likely to occur in the future without any action alternative being implemented. Since 1999, Banks Lake has been operated with an August drawdown for flow augmentation, limited to water surface elevation 1565 feet. This is the most likely operation to occur in the future.

In Appendix C, page 2, under Hydrologic Modeling, paragraph 5, it states the analysis is based on the assumption that Banks Lake is full on August 1. The

maximum impact is if the lake is at water surface elevation 1570 feet and it went to elevation 1565 feet.

SL 03 03

Impact analysis in a NEPA document is primarily a forward looking assessment. Actions likely to occur under the No Action Alternative are projected. Anticipated changes in conditions (impacts) of the Action Alternative are compared to the changes in conditions (impacts) of the No Action Alternative. For this EIS, the No Action Alternative includes compliance with RPA Action 23, the 5-foot drawdown from water surface elevation 1570 feet to 1565 feet. Reclamation committed to that RPA action in its *Findings and Commitments Implementing December 2000 Biological Opinions for the Federal Columbia River Power System* (Reclamation 2001) (BiOp) and other related actions. Reclamation found that it was consistent with current Banks Lake operations because the reservoir had recently been operated within that range in August in years prior to issuance of the BiOp. It is also consistent with Reclamation's 1985 commitment to limit operations to that range for power purposes, to the extent practicable, in response to the Northwest Power Planning and Conservation Council's (formerly the Northwest Power Planning Council) Fish and Wildlife Program.

The No Action Alternative describes an operation that includes drawdown from the water surface elevation 1570 feet because this captured the full range of conditions that might occur in the event that no action is taken.

SL 03 04

New numbers for tables have been included.

When looking at total power cost benefits, you must include the cost for pumping. There is a difference in cost to pump in August vs. cost to pump in September. If you reduce the pumping in August from what it would have been and increase pumping in September from what it would have been, then you must reflect those impacts. See also response to SL 03 02.

SL 03 05

See response to FA 01 03. While individually not significant in the overall flow of the Columbia River, the contribution to flow by Banks Lake water, together with water from other sources, will improve flows and increase the probability of meeting flow objectives.

Total augmentation water is more than 5 MAF. The first half of August meets target flows at McNary Dam 42 percent of the time and the second half of August meets targets 12 percent of the time with augmentation water, compared to 0 percent of the time without augmentation.

The flow objectives at McNary Dam would not be met in any year during either August period without the combined summer flow augmentation. The additional 127,200 acre-feet from Banks Lake would comprise less than 6 percent, on average, of the combined flow augmentation provided in August from Libby, Hungry Horse, Grand Coulee, Dworshak, the upper 5 feet of Banks Lake, the upper Snake, and Brownlee reservoirs.

SL 03 06

See response to SL 03 05.

SL 03 07

See responses to SL 03 02 and SL 03 05.

SL 03 08

See response to CO 01 01.

See also response to FA 01 03.

SL 03 09

Banks Lake drawdown is part of a larger flow augmentation program that, according to NOAA Fisheries, would provide benefits to listed species.

See also response to FA 01 03 and SL 03 05.

SL 03 10

Information on the climate in Grant County in August and September has been added to the first page in Chapter 4 under Vegetation, Fish, and Wildlife.

Additional information has been provided throughout this section.

SL 03 11

The total number of littoral zone acres that would be exposed is 2,576. This change has been made in the document in the Vegetation section. The suggestion that large areas of Banks Lake are shallow in nature is not accurate. Figures 3.2 and 3.3 show the topographic map of Banks Lake which highlight the 10 ft. drawdown zone. It can clearly be seen that shallow areas exist in limited areas (described on page 3-3). Much of Banks Lake consists of very steep shorelines, particularly on the west side of the lake. The most important point to understand is the importance of the shallow littoral zones that do exist. These areas are important nursery areas to large number of fish species present in Banks Lake. The map has been corrected.

SL 03 12

Information on the climate in Grant County in August and September has been added to the first page in Chapter 4 under Vegetation, Fish, and Wildlife.

SL 03 13

The DEIS states “The growing season is nearing its end in August, therefore, decreasing adverse impacts that might occur if drawdown occurred earlier in the

growing season.” The growing season in Eastern Washington, as defined by the Western Regional Climate Center, occurs from April through September (WRCC 2002). Drawdowns would occur during the 5th month of a 6-month growing season. Reference to the growing season is to show that aquatic vegetation is well established by August. Young plants are vulnerable to adverse conditions caused by drawdowns. This is stated in the EIS in Chapter 3, Vegetation, Aquatic Macrophytes, third paragraph, “Small young plants are especially vulnerable to changing water levels that may place them in water too deep or muddy to allow for adequate light penetration or so shallow as to expose them to turbulence or desiccation or cover them with sediment.”

SL 03 14

The vegetation analysis shows species by species which are likely to be able to tolerate drought (that is, desiccation caused by drawdown) and which are likely to be intolerant of drought and, hence, may be adversely impacted by the desiccation caused by drawdown. The most abundant species in the Banks Lake littoral zones are reed canarygrass and Baltic rush, both of which are drought tolerant. The vegetation sections in chapters 3 and 4 have been expanded to more clearly show the drought tolerances of the dominant species present at Banks Lake. Tables 4-1 and 4-2 summarize the impacts to most species.

SL 03 15

Some submergent vegetation will die, but the amount would not cause low dissolved oxygen levels. Soils high in clay content or high in organic matter retain moisture longer. Much of the aquatic vegetation is drought tolerant and much of the soils present in shallow bays and shorelines that support aquatic vegetation are composed of clays and or organic matter that retain groundwater and, hence, keep roots moist. Reclamation does not anticipate massive die-offs of vegetation for short-term drawdowns.

Information has been added to the introductory vegetation, fish, and wildlife sections and to the surface water quality section to clarify the impacts.

SL 03 16

Additional aquatic macrophyte species are included in the document to provide a clearer understanding of likely drawdown impacts. Tables 3-1 in the Affected Environment and table 4-1 in the Environmental Consequences sections have been slightly revised to increase clarity.

SL 03 17

Information has been added on the distribution, abundance, and species composition of riparian vegetation. Tables 3-1 in the Affected Environment and table 4-1 in the Environmental Consequences sections have been slightly revised to increase clarity.

SL 03 18

The impacts of changes in riparian vegetation to raptors and neotropical migrant songbirds are included in the Wildlife section of chapter 4. Analysis of impacts to the bald eagle has been expanded to include impacts of changes in riparian vegetation.

SL 03 19

Soils are described in Chapter 3 of the EIS and by reference in the Grant and Douglas Soil Surveys. Any adverse impacts to soils are described in chapter 4.

SL 03 20

The analysis focused on incremental effects and the impacts of the Action Alternative compared to impacts under the No Action Alternative. Those effects are discussed in chapter 4. See also the response to SL 03 03.

SL 03 21

The impact assessment is a multi-dimensional discussion, incorporating the analysis of three indicators:

1. Quality and quantity of spawning and nursery habitat in shallow emergent vegetation; shallow unvegetated flats; and boulders, cobble and gravel
2. Ability of juvenile fish to withstand predation pressure during drawdown
3. Quality and quantity of the aquatic food base (benthic invertebrates and primary productivity; i.e., zooplankton)

These discussions are found in chapters 3 and 4 in the Fish sections.

SL 03 22

The Lower Granite Reservoir, a U.S. Corps of Engineers dam, was drawn down 33 feet at a rate of 2 feet per day in March of 1992. This drawdown stranded more than an estimated 15,000 fish, primarily juveniles comprised mostly of brown bullhead and crappie. Largemouth bass were thought to be the most seriously affected, due to the susceptibility of adults to stranding in the limited, off-channel spawning habitats in Lower Granite Reservoir (Schuck, 1992). Immediate impacts occurred to species inhabiting backwaters and embayments including bluegill, pumpkinseed, warmouth, green sunfish, largemouth bass, white crappie, black crappie, brown bullhead, yellow bullhead, black bullhead, tadpole madtom, and common carp. Large numbers of crayfish were also killed as the benthos (lake bottom) was exposed, adversely affecting largemouth bass, smallmouth bass, channel catfish, and other resident fish that prey on crayfish.

In analyzing the impacts of reservoir drawdowns, resulting from the proposed removal of the dams in the Snake River, the USACE (2002) states that a critical factor in determining potential short-term effects on resident fish is the seasonal

timing of dam removal. Most resident fish are spring and early summer spawners. Drawdowns (in this case due to dam removal) that occur during late summer, fall, winter, and very early spring would likely result in a lower overall impact due to water level declines and high turbidity because spawning, growth, and feeding by resident fish are minimal during most of this period. The USACE also indicates that the drawdown would place predators and prey in closer proximity, potentially enhancing feeding.

Based on the experience of the USACE for the March 1992 experimental drawdown of Little Goose and Lower Granite dams; and based on the Corps' analysis of potential drawdown impacts to Snake River reservoir from dam removal, a number of conclusions relative to the 10 foot drawdown proposed for Banks Lake can be made:

- Adverse impacts occur to fish species that occupy backwaters and embayments when drawdowns occur during spring. However, such adverse impacts are reduced when drawdowns occur during late summer, fall, and winter. Adverse impacts due to drawdowns are discussed in detail in the Banks Lake EIS in chapter 4 in the sections on Vegetation, Fish, and Wildlife.
- Rapid drawdowns can strand fish in shallow habitats, such as mitigation ponds, flood gulches cut off by railroad berms and backwaters, particularly given the extremely rapid drawdowns (2 feet per day) that occurred during March of 1992. Potential stranding in Banks Lake was not addressed for two reasons: the rate of drawdown would be 0.5 feet per day, a greatly reduced rate compared to the Corps' drawdown rate allowing fish to move into deeper water; and there are no flooded gulches or mitigation ponds that would cause fish to become trapped and stranded.
- Drawdowns adversely affect benthic invertebrates (i.e. crayfish). Adverse impacts to benthic invertebrates were discussed on pages 4-12 and 4-13 of the Banks Lake DEIS.

SL 03 23

Reclamation believes that the evaluation of alternatives as presented in the draft EIS fairly describes the potential actions that would meet the purpose and need. Reclamation acknowledges that there are other potential sources of water or other ways of supporting flows in the Columbia River, but RPA 31 specifically requires Reclamation to evaluate the impacts to Banks Lake of the drawdown from water surface elevation 1565 feet to 1560 feet. Under NEPA, the range of alternatives to be considered are those that relate to the purpose and need of the project, which in this case is to comply with Action 31 of the BiOp. Reclamation looked at four scenarios on how the drawdown might occur but limited the analysis to 10 feet maximum drawdown because that is the level described in the BiOp.

SL 03 24

The action agency is responsible for defining the purpose and need of their project. It is narrowly defined because it evaluates impacts of one of 199 actions contained in the BiOp. Reclamation reviewed and accepted the BiOp with our Findings of Commitment. Most of the actions in the BiOp had either already been evaluated under the System Operations Review EIS, or did not require additional environmental analysis. Since Action 31 directed Reclamation to study the impacts of up to a 10 foot draw down, Reclamation decided to use the NEPA process to ensure public involvement. See also responses to SL 03 23 and ID 02 02.

SL 03 25

RPA Action 31 requested that Reclamation “assess the likely environmental effects of operating Banks Lake up to 10 feet down from full pool during August.” In its *Findings and Commitments Implementing December 2000 Biological Opinions for the Federal Columbia River Power System* (Reclamation 2001), Reclamation concluded that RPA Action 31 was reasonable and prudent and that it was within the agency’s authority to conduct the requested assessment. Reclamation also determined that, following appropriate environmental compliance actions, if determined to be warranted, it could also implement the 10-foot drawdown.

It is Reclamation’s responsibility to determine the purpose and need of the proposed action. The identified purpose and need as identified in the EIS is “to enhance the probability of meeting flow objectives in the Columbia River at McNary Dam during the juvenile out-migration of ESA-listed salmonid stocks (specifically Snake River fall chinook salmon) by altering the August drawdown of Banks Lake from water surface elevation 1565 feet down to elevation 1560 feet.” The commenter has indicated that Reclamation has an obligation to independently assess the RPA actions included in the BO; and this NEPA process provides for the assessment of RPA Action 31. The alternative scenarios identified in the EIS are examples of how the operations could vary within the identified Action Alternative and are those that would allow Reclamation to meet the identified purpose and need.

SL 04 01

Comment noted.

SL 05 01

See response to CO 01 02.

SL 05 02

A discussion about mosquitoes has been added to the “Social, Health, and Safety Environment” section in chapters 3 and 4.

SL 05 03

Additional analysis of impacts on the bald eagle has been added.

Impacts to the Pygmy rabbit are discussed in chapter 4 under the Threatened, Endangered, and Special Status Species section.

Hydraulic continuity is discussed in chapters 3 and 4 in the Groundwater Quality sections.

SL 05 04

See response to CO 01 02. Reclamation's evaluation indicated that some local businesses may be affected, but overall, impacts to the economy were not widespread.

SL 05 05

See response to SL 03 05.

SL 05 06

See response to CO 01 02. See also response to CO 01 01.

SL 05 07

Comment noted.

SL 05 08

See response to CO 01 01.

SL 05 09

See response to SL 03 23.

SL 05 10

See response to CO 02 04.

SL 06 01

See response to CO 01 02. See also response to CO 02 01.

SL 06 02

Reclamation considered other alternatives but the action alternative as described in the EIS is the only way to meet the goals of RPA Action 31 for supplying additional water for flows during the month of August by drawing down Banks Lake an additional 5 feet to water surface elevation 1560 feet. Reclamation has committed to pursue modification of boat ramps, therefore, keeping most recreation facilities available for public use.

SL 07 01

See response to CO 01 02.

SL 07 02

See response to CO 01 02.

SL 07 03

The cultural components identified are evaluated under socio-economic and environmental justice impacts sections.

SL 07 04

See response to CO 01 02.

SL 07 05

See response to CO 01 02.

SL 07 06

As stated in CO 01 02, Reclamation would mitigate by working on facilities on Federal lands. Sun Banks Resort is on State land.

SL 07 07

The relationship between visitation levels and spending levels appears to be complex and the variables do not appear to be directly correlated. The relationship between Banks Lake water surface elevations and visitation and spending is more complex, and the data provided are insufficient to define that relationship or demonstrate a causal relationship between reservoir drawdown and subsequent spending and visitation.

There are many social and economic factors affecting tourism spending; for example, available vacation time, availability of substitutes, disposable income, individual preferences, travel costs, etc.

SL 07 08

See response to CO 01 02.

SL 07 09

See response to CO 01 02.

SL 07 10

See response to SL 01 09.

SL 07 11

Reclamation committed to pursue mitigation for these impacts as identified in the Environmental Commitments. Also, see response to CO 01 02.

SL 07 12

See response to SL 01 09.

SL 07 13

See response to SL 01 09.

SL 07 14

See response to SL 01 09.

SL 07 15

See responses to CO 01 02. Reclamation's evaluation indicated that some local businesses may be affected, but overall, impacts to the economy were not widespread.

SL 07 16

See responses to CO 01 02 and SL 07 05. Some minority and low income individuals could be adversely affected.

SL 07 17

See response to CO 01 02.

SL 07 18

Comment noted.

SL 07 19

See responses to CO 01 02. Access to the lake will not be eliminated.

SL 07 20

Comment noted. See response to CO 02 01.

SL 07 21

See response to CO 01 02.

SL 07 22

See response to SL 01 09.

SL 07 23

See response to SL 05 02.

SL 07 24

See responses to CO 01 02 and SL 07 15. Some minority and low income individuals could be adversely affected.

SL 07 25

The impacts to visual quality are described under "Visual Quality" in chapter 4.

SL 07 26

See response to SL 05 02.

See also response to CO 01 02.

SL 07 27

See response to SL 05 03.

SL 07 28

Reclamation is not aware of any aquifers that are dependent on Banks Lake.

SL 07 29

See responses CO 01 02 and SL 05 04.

SL 07 30

See response to SL 03 05.

SL 07 31

See response to CO 02 04.

SL 08 01

See response to SL 05 02.

SL 09 01

See response to CO 01 02.

SL 09 02

See response to CO 01 02.

SL 10 01

See response to SL 03 05.

SL 10 02

Operations target daily flows at McNary, as well as monthly averages.
Reclamation does not look at meeting hourly flow targets for BiOp purposes.
Analyzing impacts by one-half month is sufficient.

SL 10 03

Comment noted.

SL 11 01

Comment noted.

SL 11 02

See response to SL 05 02.

SL 12 01

Comment noted.

SL 12 02

Comment noted.

SL 12 03

See response to CO 01 02.

SL 12 04

See response to SL 05 02.

SL 13 01

See response to CO 02 01. See also responses to SL 05 02, CO 01 01, and CO 01 02.

Irrigation Districts — ID

ID Irrigation Districts

ID 01 01

In response to public request, the deadline for comments on the draft EIS was extended until April 11, 2003, providing a 90-day comment period.

ID 01 02

The deadline for comments on the DEIS was extended until April 11, 2003.

ID 02 01

Reclamation has considered your enclosures and has responded to each of the issues as they appear in your letter.

ID 02 02

Reasonable alternatives are those which allow the agency to meet its stated purpose and need. Alternatives presented in the EIS describe the potential actions that would meet the purpose and need. That there are other potential sources of water or other ways of supporting flows in the Columbia River is acknowledged, but RPA Action 31 specifically requires Reclamation to evaluate the impacts to Banks Lake of the drawdown from water surface elevation 1565 down to 1560 feet.

Reclamation used water surface elevation 1560 feet because RPA Action 31 indicated that Reclamation would evaluate a 10-foot drawdown (from full pool elevation 1570 feet).

ID 02 03

See responses to SL 03 02 and SL 03 03.

ID 02 04

See response to CO 01 01.

ID 02 05

The analysis of effects to listed endangered species is now addressed in the EIS by incorporating by reference the BiOp 2000.

ID 02 06

In correspondence from NOAA Fisheries on May 22, 2003, they indicated a possible problem related to the CRISP model data set used by the commenter. However, the incremental effects due to the Banks Lake drawdown are not appreciably different from those described in the comment.

ID 02 07

NOAA Fisheries also indicated the mid-point for passage of the listed Snake River fall Chinook at McNary Dam is August 1. Although the majority of the Hanford Reach fall Chinook population has passed, the fish for which this action

is intended—the Snake River fall Chinook—are still passing the project during the August time frame.

ID 02 08

Regardless of the analysis used, individually this action has relatively minor benefits for the Snake river fall chinook. However, cumulatively, the flow augmentation impacts may result in more significant benefits.

ID 02 09

Appendix C of the EIS analyzes the probability of meeting these flow objectives, which were determined by NOAA Fisheries. Reclamation does note that the CRISP analytical model is built on a data set and relationships which influence the results of the analytical procedure. One example where this data set may be biased is the use of a 10-year average (1992 – 2002) for the survival of juvenile fall Chinook from McNary Dam to below Bonneville Dam. If the adoption of the Biological Opinion flow measures in 1995 has had a beneficial effect on survival through this reach, the use of a data set which included years prior to adoption of the BiOp flow measures would not be correctly captured by the model. However, whichever models are used, the effect of Banks Lake water on survival of outmigrating smolts is small. NOAA Fisheries seeks to obtain the finite quantity of water needed to meet its “summer flow objectives.”

ID 02 10

NOAA Fisheries notes that the Northwest Power Planning and Conservation Council’s recommendations regarding flows for salmon have a significant experimental component to them. The recommended changes are intended to evaluate and better define the benefits of providing flow augmentation while assessing how the provision of that water affects resident fish populations in the reservoirs from which flow augmentation volumes are provided.

ID 02 11

Some resources include an affected environment larger or smaller than other resources. The resource specialist must determine the geographic area of any change to a resource.

ID 02 12

See response to SL 03 05.

Additional information was added to the “Chapter 4, Cumulative Impacts, Anadromous Fish” section.

ID 02 13

See response to SL 03 05. In addition, it has been the policy of NOAA Fisheries not to measure incremental benefits to system survival due to relatively small changes in operations. Their opinion is that additional flow in the river directly increases the velocity in the river, which increases survival to some increment.

The increment may not be measurable but, in combination with other actions, would contribute to the recovery of the ESA listed species.

ID 02 14

Summer flow targets for the BiOp are 200,000 cfs at McNary Dam and serve as a measure of fish benefits throughout the Lower Columbia River.

ID 02 15

See response to SL 03 05.

ID 02 16

The Northwest Power Planning and Conservation Council's amendments are being analyzed for possible implementation by the affected Federal agencies.

ID 02 17

The shortest drawdown from elevation 1570 feet to 1560 feet that can be physically accomplished is a late draft starting August 12 and refilling by September 10. This scenario shuts the pumps off completely during drawdown, then refills as fast as possible. Analysis of impacts to resident fish is included in the EIS in the Fish section.

ID 02 18

BPA indicates that there would be no diminishment of peaking ability with Banks Lake drawn down 5 to 10 feet. They do not use Banks for peaking operations during August and September. Banks Lake becomes valuable for peaking operations in December through February. BPA has indicated that the power would be available.

ID 02 19

See response to CO 01 02.

ID 02 20

See response to CO 01 02. See also responses to CO 01 01, ID 02 02, and FA 01 01.

ID 02 21

See response to ID 02 07.

ID 02 22

See response to CO 02 01. Also, Reclamation acknowledges that in the event that the pumping plant were to be completely offline and unavailable as of August 31, with no prospect of returning to service before October 31 and Banks Lake were to be at elevation 1560 feet as of August 31, then Banks Lake would, in an average diversion year, experience a near-maximum draft to meet the September and October irrigation demands. Additionally, over the last 10 years, 3 years—1993, 1994 and 2001—would have exceeded the available supply from Banks

Lake in the given worst-case scenario. Additional information has been provided in chapter 3 under “Irrigated Agriculture.”

ID 02 23

RPA Action 31 requested that Reclamation “assess the likely environmental effects of operating Banks Lake up to 10 feet down from full pool during August.” In its 2001 Findings and Commitments Implementing December 2000 Biological Opinions for the Federal Columbia River Power System (Reclamation 2001), Reclamation concluded that RPA Action 31 was reasonable and prudent and that it was within the agency’s authority to conduct the requested assessment. Reclamation also determined that, following appropriate environmental compliance actions and if determined to be warranted, it could also implement the 10-foot drawdown. The purpose and need identified in the draft EIS was to respond to RPA Action 31 and assess the impacts of providing additional summer flow augmentation in the Columbia River for listed stocks by drawing Banks Lake down an additional 5 feet in August. The commenter has indicated that Reclamation has an obligation to independently assess the RPA actions included in the BO and this NEPA process provides for the assessment of RPA Action 31. The alternative scenarios identified in the EIS are those that would allow Reclamation to meet the identified purpose and need.

ID 03 01

See responses to comment letter received from the East Columbia Basin Irrigation District (ID 02). That comment letter included the same set of enclosures.

ID 03 02

See responses to SL 03 02 and SL 03 03.

ID 03 03

See responses to SL 03 05 and SL 03 23.

ID 04 01

See response to ID 02 02.

ID 04 02

See response to CO 01 01.

ID 04 03

See response to CO 01 01.

ID 04 04

See response to ID 02 10.

ID 04 05

See response to SL 03 05.

ID 04 06

See response to ID 02 22.

ID 04 07

See response to CO 01 02.

ID 04 08

See response to CO 01 01.

ID 05 01

Comment noted.

ID 05 02

See responses to:

1. SL 03 05
2. CO 01 02
3. Table 4-13
4. ID 02 22
5. Comment noted
6. The deadline for comments on the draft EIS was extended until April 11, 2003, providing a 90-day comment period. Public hearings were held in central locations around the Columbia Basin Project. One was held in Coulee City on February 11, 2003, and one was held in Moses Lake on February 12, 2003.

Interested Entities and Individuals — IE

IE Interested Entities and Individuals

IE 01 01

Comment noted.

IE 02 01

Comment noted.

IE 03 01

See response to CO 01 01. See also responses to CO 01 02 and SL 05 02.

IE 04 01

Information has been added to describe the fish barrier net at the end of the Fish sections in chapters 3 and 4. The boat docks will be modified under mitigation for recreation and access would be available.

IE 05 01

See response to CO 02 01.

IE 05 02

See response to CO 01 01.

IE 05 03

See response to CO 01 02.

IE 05 04

Comment noted.

IE 06 01

Comment noted.

IE 07 01

Comment noted.

IE 08 01

See response to CO 01 02. See also response to SL 05 02.

IE 08 02

The deadline for comments on the DEIS was extended until April 11, 2003.

IE 09 01

Comment noted.

IE 10 01

See response to CO 01 02. See also response to CO 02 01.

IE 11 01

See response to CO 01 02.

IE 11 02

See response to SL 05 02.

IE 11 03

See response to ID 02 02.

IE 12 01

See response to CO 01 02.

IE 13 01

See response to CO 01 01. See also response to CO 01 02.

IE 14 01

See responses to CO 01 01 and CO 01 02.

IE 15 01

See response to CO 01 02.

IE 15 02

Loss of recreational opportunity is addressed in Chapter 4, Economics, Regional/Local Economy, under Recreation Days and in Chapter 4, Recreation, under Recreation Visits.

IE 15 03

See response to ID 02 02.

IE 15 04

See response to SL 05 02.

IE 15 05

The deadline for comments on the DEIS was extended until April 11, 2003.

IE 16 01

Comment noted.

IE 17 01

Comment noted.

IE 18 01

Comment noted.

IE 19 01

See response to CO 01 02. See also response to CO 02 01.

IE 20 01

See response to CO 01 02.

IE 20 02

See responses to CO 01 02 and ID 02 02.

IE 21 01

See response to CO 02 01.

IE 22 01

See response to CO 01 02.

IE 23 01

Comment noted.

IE 24 01

See response to CO 02 01.

IE 25 01

Comment noted.

IE 26 01

Comment noted. See also response to CO 01 02.

IE 27 01

See response to CO 01 02. See also response to SL 05 02.

IE 28 01

Comment noted.

IE 28 02

See response to ID 05 02.

IE 28 03

See response to CO 01 01.

IE 28 04

See responses to:

1. SL 03 05
2. CO 01 02
3. Table 4-13
4. ID 02 22
5. Comment noted.
6. Comment noted.

IE 29 01

Comment noted.

IE 30 01

See responses to CO 02 01 and CO 01 02.

IE 31 01

Comment noted.

IE 32 01

Comment noted.

IE 33 01

See response to CO 01 02.

IE 34 01

Comment noted.

IE 35 01

See response to CO 02 01.

IE 36 01

Comment noted.

IE 37 01

See response to CO 01 02.

IE 38 01

Comment noted.

IE 38 02

See response to CO 01 02.

IE 39 01

See response to CO 01 01. Estimates of total numbers of returning adult salmon as a result of this Action Alternative have not been determined. See also ID 02 06.

IE 39 02

See response to CO 01 02.

IE 39 03

Loss in generation for both the PUDs and the FCRPS is due to spill requirements during draft. During the migration, the mainstem projects are required to spill a certain percentage of their flow. During September through November when Banks Lake is refilling, there is no spill requirement on the mainstem. The loss in

generation is due to this difference in additional power generated during draft, and generation lost during refill. Estimated costs range from \$966,871 for the FCRPS and up to \$451,700 for the Mid Columbia Projects.

IE 39 04

See response to CO 02 01. Also, refer to Grand Coulee Project Hydroelectric Authority, table 4-13, page 102.

IE 39 05

This question is impossible to answer, and definitions of words are open to individual interpretation.

IE 39 06

See response to IE 39 01.

IE 40 01

See response to CO 02 01.

IE 41 01

See response to CO 01 02.

IE 42 01

Comment noted.

IE 43 01

See response to CO 01 01. See also response to CO 01 02.

IE 44 01

See response to CO 01 02. See also response to SL 05 02

IE 45 01

Comment noted.

IE 46 01

Comment noted.

IE 47 01

Comment noted.

IE 48 01

Comment noted.

IE 49 01

Comment noted.

IE 50 01

See response to CO 02 01.

IE 51 01

Comment noted.

See response to CO 02 01.

IE 51 02

See response to SL 03 05.

IE 52 01

Comment noted.

IE 53 01

Comment noted.

IE 54 01

See response to CO 01 02.

IE 55 01

Comment noted.

IE 56 01

See response to CO 01 02.

IE 57 01

Comment noted. See also response to CO 01 02.

IE 58 01

Comment noted.

IE 59 01

See response to CO 01 02.

IE 60 01

See response to CO 02 01.

IE 60 02

See response to CO 02 01.

IE 60 03

Comment noted.

IE 61 01

Comment noted.

IE 62 01

Comment noted.

IE 63 01

See responses to CO 01 02 and CO 02 01.

IE 64 01

Comment noted.

IE 64 02

See response to CO 01 02.

IE 65 01

Comment noted.

IE 65 02

See response to CO 02 01.

IE 65 03

Comment noted.

IE 66 01

Comment noted.

IE 67 01

Comment noted.

IE 68 01

See document changes in the vegetation, fish, and wildlife sections in Chapters 3 and 4.

IE 68 02

See document changes in Chapters 3 and 4 on fish.

IE 68 03

See response to CO 01 02.

IE 68 04

See response to CO 01 01.

IE 69 01

Comment noted.

IE 70 01

See response to ID 02 02.

IE 71 01

Comment noted.

IE 72 01

Comment noted.

IE 72 02

See response to ID 05 02. Also, Reclamation provided public notice of the hearings in local newspapers through press releases and provided a website for additional information.

IE 73 01

Comment noted.

IE 74 01

Comment noted.

IE 75 01

See response to CO 01 02. See also response to ID 02 02 and SL 05 02.

IE 76 01

See response to CO 01 02.

IE 76 02

See response to CO 01 02.

IE 76 03

Comment noted.

IE 77 01

Comment noted.

IE 78 01

Comment noted.

IE 78 02

Review and discussion of other causes of salmon jeopardy is outside the scope of this document.

IE 78 03

See response to SL 07 29.

IE 78 04

See response to CO 01 01.

IE 79 01

Comment noted.

IE 79 02

See response to CO 01 02.

IE 80 01

Comment noted.

IE 81 01

Comment noted.

IE 82 01

See response to CO 01 02. See also response to CO 02 01.

IE 83 01

See response to SL 05 02. See also response to CO 01 02.

IE 84 01

See response to CO 01 02.

IE 85 01

Comment noted.

IE 86 01

See response to CO 01 02. Sun Banks' location makes it vulnerable to boat docks being out of water in a drawdown. As the need for future drawdowns of various depths had been anticipated, Reclamation encouraged the Sun Banks Resort to find a different location on which to build.

IE 86 02

See response to CO 01 02.

IE 86 03

A September drawdown does not meet the need for enhanced flows during the month of August. Reclamation has committed to mitigating impact to recreation by modifying existing recreation facilities on public lands to allow their use during times of lower water.

See also response to ID 02 02.

IE 87 01

Comment noted.

IE 88 01

Comment noted.

IE 88 02

See response to CO 02 01.

IE 88 03

Comment noted.

IE 89 01

Comment noted.

IE 90 01

See response to CO 01 02.

IE 90 02

See response to SL 05 02.

IE 91 01

Comment noted.

IE 92 01

See response to CO 01 02.

IE 93 01

Comment noted.

IE 94 01

See response to CO 01 02.

IE 95 01

Comment noted.

IE 95 02

See response to CO 02 01.

IE 95 03

Comment noted.

IE 96 01

Comment noted.

IE 96 02

See responses to CO 01 01 and SL 03 05.

IE 96 03

As stated in response ID 02 02, the purpose of this EIS is to evaluate the impacts of a drawdown to the resources of Banks Lake, not to evaluate other potential sources of water. If there is a reasonable expectation of not being able to refill

during early September, then the drawdown would not take place during that year. The Action Alternative proposes refill to elevation 1570 feet by September 22.

IE 97 01

See response to CO 01 02 and CO 01 01.

IE 98 01

See response to CO 01 01 and SL 03 05.

IE 98 02

See response to CO 01 02.

IE 98 03

See response to CO 02 01.

IE 99 01

Comment noted.

Interested Organizations — IO

IO Interested Organizations

IO 01 01

Comment noted.

IO 01 02

See response to SL 05 02. A discussion about mosquitoes has been added to the “Social, Health, and Safety Environment” section in chapters 3 and 4.

IO 01 03

See response to CO 01 02.

IO 01 04

See responses to FA 01 03 and ID 02 07.

IO 02 01

Comment noted.

IO 03 01

Comment noted.

IO 03 02

See response to CO 01 02.

IO 03 03

Comment noted.

IO 03 04

This is stated in the EIS in the Vegetation and Fish sections in chapters 3 and 4.

IO 03 05

Adverse impacts to some of the Banks Lake fish species are likely to occur. Reservoir drawdown, however, is a well established management technique used by many reservoir managers to promote improved habitat for fish. It is one of the best tools available to combat the adverse effects of reservoir aging. Manipulation of reservoir water levels through drawdown is a tool widely used by reservoir fisheries managers. Ploskey (1986) reviewed over 350 scientific articles and found a general consensus among reservoir managers on reservoir water levels: reservoir managers should attempt to (1) draw down water in late summer or fall, (2) establish herbaceous vegetation by natural colonization or seeding, (3) flood terrestrial vegetation in spring, and (4) maintain high water for as much of the growing season as possible. The Kansas Fish and Game Commission, for example, often limits the extent of drawdown to 10 to 20 percent of the original area, seeds vegetation extensively, and raises water levels slightly in fall to flood vegetation for waterfowl (Groen and Schroeder 1978). In most reservoirs, drawdowns are best scheduled for late summer or fall because water temperatures

are above 13 °C (55 °F), and warmwater piscivores, such as walleye and pike, are still feeding and growing. Earlier drawdowns may not be favorable to survival of young-of-year fishes, and drawdown in winter does not permit the establishment of terrestrial vegetation.

Other syntheses of the literature on reservoir management (Heman et al. 1969, Keith 1975; Wegener and Williams 1975; Groen and Schroeder 1978, Willis 1986; and Wright 1991) agree with Ploskey's review. They recommend operations that encourage strong year class production of sportfish. According to these studies, optimal operations are characterized by slowly rising water levels in the spring that flood shoreline vegetation by midsummer. These operations promote strong year classes by not dewatering spawning sites and by providing additional rearing habitat for young-of-year. A drawdown beginning in mid- to late-summer should occur to concentrate prey species and allow establishment of vegetation. Some authors further recommend substantial midsummer drawdowns periodically to re-establish vegetation that will increase fish habitat later in the year (Keith 1975, Wegener and Williams 1975).

IO 03 06

See response to CO 01 02.

IO 03 07

See response to CO 01 01 and CO 02 01.

IO 04 01

See response to CO 01 02. and CO 02 01

IO 04 02

See response to ID 02 10.

IO 04 03

See response to CO 01 02.

IO 05 01

See response to ID 02 02.

This request is for an additional 10 foot-drawdown to water surface elevation 1550 feet and is outside the scope of the study.

IO 05 02

See response to ID 02 02. Also see chapter 5 of the EIS for additional information on tribal consultation and coordination.

IO 05 03

Comment noted.

IO 05 04

See response to ID 02 02.

This request is for an additional 10 foot-drawdown to water surface elevation 1550 feet and is outside the scope of the study.

IO 05 05

The CRITFC model appears to use 2001 rates when power costs were excessively high. It appears that CRITFC did not look at refilling Banks Lake to water surface elevation 1565 feet in September; so the total impact of the action was not evaluated.

IO 06 01

See response to ID 02 02.

IO 06 02

See response to CO 01 02.

IO 06 03

See response to ID 02 02.

IO 07 01

The Economics Hydropower section has been modified to recognize that this could be a significant loss. The power rates used by BPA were \$30.40 for August and \$36.12 for September.

IO 07 02

Reclamation has considered your enclosures and has responded to each of the issues as they appear in your letter.

IO 07 03

No mitigation will be provided as operations are within the normal operating range of the project.

IO 08 01

See response to CO 01 02 and CO 02 01.

IO 08 02

See response to CO 02 01.

IO 08 03

See response to ID 02 02.

IO 09 01

Comment noted.

IO 09 02

See response to CO 01 02.

IO 10 01

See response to SL 03 05.

IO 10 02

See response to CO 01 02.

IO 10 03

See response to CO 02 01.

IO 11 01

Comment noted.

IO 11 02

See response to CO 01 02.

IO 11 03

See response to CO 02 01.

IO 12 01

Comment noted.

IO 12 02

See response to CO 01 02.

IO 12 03

See response to CO 02 01.

IO 13 01

Comment noted.

IO 14 01

Comment noted.

IO 14 02

See response to CO 01 02.

IO 15 01

See responses to CO 02 01, CO 01 02, IO 16 01, CO 02 02, and SL 03 09

IO 16 01

Reclamation examined the impacts on fish and its habitat for spawning and nurseries, juvenile fish predation, and aquatic food base. Although some adverse impact could occur to specific juvenile fish species through predation, and some

impact to benthic invertebrates in the aquatic food base, the conclusion is that the overall impacts are minor, as indicated in tables 4-3, 4-4, and 4-5.

IO 16 02

Comment noted.

IO 16 03

Comment noted.

IO 16 04

Comments noted.

IO 16 05

See response to ID 02 02.