Comment No.	Page	Line	Comment	Response
1	ii-iii		Formatting corrections needed under the “List of Figures” & “List of Tables” portions of the document	Re-spaced. Other “formatting” issues are not clear with comment.
2			Tables 4, 5, 6, and 8 and Figures 3, 7, and 11, for consistency with latest (and final; December 2011) version of the water budget. I’m sending you the latest version again as a pdf, along with spreadsheets with raw data and linked figures, so you can update graphs easily. Feel free to edit the figures in these spreadsheets to meet your formatting requirements and use them in the document. I think that all of these figures and tables are based on information from January 2011, which was preliminary.	Spoke to Dr. Van Kirk again and we will stick with what is published in the needs assessment. The difference in values used are small and the time and effort for Dr. Van Kirk to sort out is not necessary.
3	1	30-34	What is the current or recalculated unmet need in the ESPA with the purchase of the fish hatchery facilities in the Thousand Springs area? See presentation on march 13, 2012 by Lynn Tominaga, Idaho Groundwater Users Association. Additionally, what is the current or recalculated short term targets, given the amount of recharge which has been conducted and other measures which have been implemented?	There is no change to the ESPA water budget as a result of the purchase of the fish hatchery. Rather this action will reduce the frequency of a “water call” and conflict between the ground water users and hatchery. Source Brian Patton.
4	1	14-17	Does the $10 billion figure include agricultural, recreation, & fisheries revenue?	This number is from the ESPA CAMP which states “The ESPA region produces 21 percent of all goods and services within the State of Idaho resulting in an estimated value of $10 billion annually.” Reworded to clarify area; the source is not clear whether it includes those industries or not.
5	1	6	Change “develop” are range of alternatives to “assess” a range of alternatives	Changed
6	1	7	Should be “southeastern” not “northeastern”.	Changed.
7	1	7	Use either Henrys Fork or Henrys Fork of the Snake River (see US Board of Geographic Naming) when referring to the mainstem river, not Henrys Fork River. Please correct throughout the document.	Put in terms of an acronym
8	1	7	southeastern Idaho, not northeastern	Changed
9	1	8	This is the only place the phrase “increasing irrigation needs” appears and it will set the wrong tone for some readers if left in place. The Needs Assessment seems to be focused on meeting existing shortages and that should be stated here rather than the prospect of new irrigation.	Deleted the word “increasing”
10	1	11	Statement "over 200,000 acres" may be inconsistent with page 25 line 4 that FMID serves 285 K acres	This is an introductory summary so is not precise; changed to “over 280,000”
11	1	19	Replace “districts” with “entities” which will include canal companies.	Done
12	1	20	“Freemont” is always “Fremont” throughout.	Done.
13	1	20	Fremont, not Freemont	Done
14	1	20	Please spell check entire document for correct spelling of “Fremont” County (only one “e” in Fremont County, ID). Incorrect and inconsistent throughout entire document.	Done
15	1	24	Add wildlife and ecosystem health to this sentence, instream flows do not just benefit fish habitat but rather benefit wildlife by providing linkage corridors and impact overall ecosystem health (i.e - cottonwood galleries, etc.).	Changed to “instream flows for fish and wildlife habitat”
16	1	24	Should also include “wildlife habiat” after fish habitat.	Changed

Comment No.	Page	Line	Comment	Response
17	1	12,13	Not only is the Henry's Fork a supplier of the ESPA, a significant portion of the study area overlies and is an integral part of the ESPA.	Change line 12 -> The Henrys Fork River overlays a portion of the ESPA and supplies …
18	1	30	Why is Wyoming mentioned in this sentence? Wyoming has not participated in this study or even contacted regarding the study.	Deleted Wyoming.
19	1	34	Is it more accurate to say “Henry’s Fork River basin”? Need to be consistent throughout in the context of “Henry’s Fork River” or “Henry’s Fork River basin”.	Added the word “basin”
20	2	1-4	The State's primary goal was study of storage in general and Teton Dam in particular. This section tends to convey the impression that storage was but one of many objectives.	While replacing Teton Dam was the State Legislature’s objective in SB 1511 the IWRB subsequently applied for a WaterSmart Basin Study cost share grant. This statement in the needs assessment accurately reflects the IWRB grant request. The Basin Study application and subsequent grant formed the basis of the Study and the Memorandum of Agreement between the State and Reclamation. This MOA is the basis of Reclamation’s participation in the Study.
21	2	1	Delete second “the”.	Done
22	2	22	A space is needed between the words “Study” and “analysis”	Done
23	2	27	insert comma between “Study” and “analyses”	This appears to be the same comment above
24	3	8-10	The HUCs are Lower Henrys Fork and Upper Henrys Fork, don’t include “river” on the end of these.	Done
25	3	4-5	By distance upstream from its confluence with the South Fork Snake, the Henry’s Fork “appears” to have its origins at Henry’s Lake, but by the definition of following a river upstream, always taking the fork of largest flow volume, the Henry’s Fork originates at Big Springs, not Henry’s Lake. The annual discharge contribution of Big Springs to the Henry’s Fork is four times that of Henry’s Lake. Please see Van Kirk and Benjamin 2000, Physical and human geography of the Henry’s Fork watershed. Intermountain Journal of Sciences 6:106-118.	Changed to reflect originating at Big Springs
26	3	3	A comma is needed in the number “4,800”	Commas are not used in elevations, except when over 9999 feet.
27	3	3	Cite the elevation at the mouth of the Henrys Fork, instead of St. Anthony, which is about 20 miles upstream from mouth).	Researched and reworded
28	3	5	The hydrologic origin of the Henrys Fork is Big Springs and the Henrys Fork is named at the confluence of Big Springs and the Henrys Lake Outlet (the 10 mile length of stream that flows out of Henrys Lake). For further information see Van Kirk and Benjamin (2000) in the Intermountain Journal of Science and the US Board of Geographic Naming website.	Changed to reflect originating at Big Springs
29	3	13	There are 6 hydroelectric projects/licenses in the basin: Island Park, Buffalo River, Ashton/St. Anthony, Chester, Fall River, and Felt	Changed line 13 -> Three major storage reservoir, six hydroelectric projects, and …
30	3	13-15	Should list the actual storage facilities and actual hydro facilities	See note above

Comment No.	Page	Line	Comment	Response
31	5	Figure 1	There are no ecological stream flow reaches shown on this map, thus the source doesn't need to be listed in the legend…or add the ecological stream flow reaches.	This reference source has been removed.
32	5	Figure 1	There are no ecological stream flow reaches shown on this map, thus the source doesn't need to be listed in the legend?	Same comment as above
33	7	18-22	I wonder if this detail is necessary here. Could you just say that Island Park is regulated as part of the Minidoka system?	Detail was given to show timing of fill.
34	7	6-7	We would say "Beginning in the 1880's" rather than "Shortly after the turn of the 20th century".	This reflects the start of subirrigation which occurred in the early 1900s – reworded.
35	7	18-19	Should this sentence read: "As part of the upper Snake River system, Island Park is allowed to store water during the winter when its rights are *in* priority." Rather, than when the rights are *out* of priority?	Changed.
36	7	22-23	Sentence should be reworded to read: In dry years, water may not be available for storage rights soon after April 1 when senior water right holders begin to divert surface flow.	Changed.
37	7	8	Delete, "and" and insert, "which caused an increase of water in Mud Lake,"	Changed
38	7	9	Specify what "upper valley" you are referring to. Many locals refer to the "upper valley" as upper Teton Valley, but that does not make sense in the context of this sentence.	Changed to "upper Henrys Fork River basin"
39	8	3-8	Clarify what fraction of total irrigated lands are represented by the FMID lands. Consider extrapolating the $100 million of FMID crop sales to all irrigated lands, considering that FMID lands are likely the most productive in the study area.	– Reclamation 2004 (title transfer) pp. 45-46 "lands within FMID constitute a significant portion of the irrigated acreage in the three-county area" – that's as specific as it gets without additional time for research
40	8	11-15	For consistency with lines 3-8 and lines 16-19, add a dollar quantification of these sectors. If it must be an estimate, reference the methods, i.e. "calculated as X jobs at $Y per year, with an indirect multiplier of Z for secondary effects."	Added updated information from the Loomis report.
41	8	Table 1	Fremont, not Freemont	Changed
42	8	16	The economic effect of river recreation for the Henrys Fork was estimated in the study by John Loomis (2005; available: http://www.henrysfork.org/recently-completed-projects). River recreation, primarily fly fishing, on the Henrys Fork annually generates about $29 million and 851 jobs. These numbers are specific to the river (versus the IDOL study that was broader, but had lesser estimates) and should be cited here.	Inserted after line 1 ->The economic effect of river recreation for the Henrys Fork was estimated in the study by John Loomis (2005). River recreation, primarily fly fishing, on the Henrys Fork annually generates about $29 million and 851 jobs.

Comment No.	Page	Line	Comment	Response
43	8&9		dealing with economics – this substantially underestimates the value of outdoor rec in the Henrys Fork Basin. Their estimate of 17 million in wages is a drop in the bucket of the overall economic value here. Fisheries brings in an estimated 50 million in economic spending in 2003. Couple that with all the other outdoor related tourism in Fremont County and you've got an economic driver. You can find 2003 fishery economic data at from the following report: Idaho Department of Fish and Game (IDFG). 2003. 2003 Economic Survey Report 08-129, Idaho Department of Fish and Game, Boise, ID USA. https://research.idfg.idaho.gov/Fisheries%20Research%20Reports/Mgt08-129Grunder2003%20Economic%20Survey%20Report.pdf IDFG conducted a similiar study in 2011. Preliminary results are indicating a 20% increase of economic impact from 2003 data. The report is not published as of 6/20/2012. Publication is expected over the next several months.. The section on *Fish and Wildlife* (p 9) needs some work. IDFG asks for a final review of this section before the final document comes out. Concepts are muddled, unclear and inaccurate. T+E species can be expanded. For example, rainbow trout should be listed as nonnative, not native. Another example, rainbow trout CAN successfully reproduce in streams with peak flows that occur during fry emergence, but survival is reduced. The statement is made that YCT numbers have declined in the last 15 years, and goes on to hypothesize why this might be. I suggest stating the area where YCT have declined to assist with evaluating the reasons. I would also suggest clarifying that hydrologic alterations that deviate from a natural hydrograph are likely a contributing factor in this decline if we are referring to the South Fork. For the wildlife references, bears should include grizzly bears, and the list should be much more comprehensive to include all species of greatest conservation need in the study area. There are many that are not listed that would be of concern here. No mention of Sage-grouse throughout this section. Also can be expanded from the nongame side of things.	See above comments
44	9		The Henrys Fork River basin supports populations of native Yellowstone cutthroat trout. In addition nonnative rainbow trout, and brown trout have also been introduced to the watershed. The Idaho Department of Fish and Game operates the Henrys Lake Hatchery near the town of Island Park part of the year for egg collections. The hydrograph of the Henrys Fork River basin shown in Figure 2 illustrates the timing of rainbow and cutthroat trout spawning and fry emergence in relation to the peak flows in the South Leigh Creek, Henrys Fork River, and the Snake River, which is representative of the groundwater-dominated streams throughout the Henrys Fork River watershed upstream of St. Anthony. Nonnative rainbow trout cannot successfully reproduce in streams that have a high peak flow immediately before and during fry emergence because the peak flow displaces eggs and fry. The Yellowstone cutthroat trout fry generally emerge in late summer and early fall when they are not displaced by high flows. Peak flows are low during rainbow trout egg incubation and fry emergence; consequently, rainbow trout have displaced cutthroat trout throughout this watershed (Van Kirk and Burnett 2004). Hydrographs for the South Fork Snake River and Teton River at South Leigh are representative of snowmelt-dominated streams throughout the Snake River watershed upstream of Palisades Reservoir. Peak flows are high during rainbow trout egg incubation and fry emergence. It is assumed that this is why rainbow trout have been less successful in invading those rivers.	Underlined text added.
45	9	8	IDFG also operates the Ashton hatchery.	Add to line 8

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46	9	9-13	South Leigh Creek is a tributary to the Teton River, located in Teton Valley. All tributaries of the upper Teton River are snowmelt-dominated systems, not groundwater dominated systems. As such, the sentence should be reworded as follows: “The hydrographs shown in Figure 2 illustrate the timing of rainbow and cutthroat trout spawning and fry emergence in relation to the peak flows in the Teton River at South Leigh Creek, the Henrys Fork River, and the Snake River. The Henrys Fork River hydrograph is representative of groundwater-dominated streams in the Henrys Fork basin while the Teton River at South Leigh Creek and Snake River at Heise hydrographs are representative of snowmelt-dominated streams in the Henrys Fork basin.”	Changed as given
47	9	18-20	This sentence can be removed if the changes suggested above are made.	Deleted sentence
48	9	11-13	Sentence referring to Figure 2 should read: …..Teton River at South Leigh Creek, Henrys Fork, which is representative of the groundwater-dominated streams throughout the Henrys Fork River watershed upstream of St. Anthony, and the Snake River.	See above changes by FTR. The change covers both comments.
49	9	18-20	Replace upstream with “downstream” (of Palisades Reservoir).	Deleted by request of FTR
50	9	2 -4	The paragraph is talking about fishing economy, and the closure of a sawmill is out of place here. Delete lines 2-4.	Deleted
51	9	1	Add: “ In 2005, with a grant from the Bureau of Reclamation, Trout Unlimited and the Henry’s Fork Foundation consulted renowned economist John Loomis to complete an economic valuation of boating and fishing in the Upper Snake River (primarily Henry’s Fork, South Fork, and Upper Snake near Jackson, WY). The 2004 angler report found that on the Henry’s Fork alone (Fremont and Madison Counties), angling contributed $29 million to eastern Idaho’s economy, and higher catch rates and larger fish would result in larger benefits to the rural communities, up to $49 million annually. (Loomis 2005)” http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/Final%20Loomis%20%20HFF%20TU%20SR%20Full%20Report%205-02-05.pdf	Done and added to list of references
52	9	6	Sentence should be reworded to read: The Henry’s Fork basin supports wild populations of native Yellowstone cutthroat trout and non-native rainbow trout, brown trout, and brook trout.	Done
53	9	6	Sentence should be reworded to: The Henrys Fork basin supports wild populations of native Yellowstone cutthroat trout and non-native rainbow trout, brown trout, and brook trout.	Done
54	9	8	Egg collections are for Yellowstone cutthroat trout, primarily for release into Henrys Lake.	Done
55	9	11	This figure refers to the flow in the Teton River at the South Leigh Creek USGS flow gage, not South Leigh Creek itself.	Changed to Teton River at South Leigh Creek
56	9	13	Kestrels, not kestrals	Done
57	9	18	Sentence should include "most of the Henrys Fork", because the Henrys Fork below St. Anthony is dominated by brown trout not rainbow trout.	Line 18 -> throughout most of the Henrys Fork watershed

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58	9	18	The Van Kirk and Burnett report referenced here discusses hydrologic alteration in the main Henry's Fork watershed upstream of St. Anthony, not in the Teton River drainage. The proper citation is the report by Van Kirk and Jenkins 2005, which is cited elsewhere in the document. I would also request that the wording be changed to be more accurate. Rainbow trout have displaced cutthroat trout throughout most of the main Henry's Fork watershed and the Fall River drainage. Rainbow trout have not displaced cutthroat trout everywhere in the Teton River drainage. The reason for the difference is likely due to hydrology. The natural hydrology of the main Henry's Fork and the Fall rivers is dominated by groundwater from the headwater springs on the Yellowstone Plateau. In absence of large snowmelt freshets, there is essentially nothing in the physical or biotic environment to act negatively on rainbow trout. They have competitive advantages over cutthroat, and they hybridize with cutthroat. In absence of a snowmelt freshet to scour their eggs and fry during late spring, rainbow trout will displace cutthroat trout. In the Teton River watershed, the natural hydrology is driven by snowmelt, and the resulting spring freshet is large enough to limit rainbow trout spawning success.	Text from comment added.
59	10		As part of the Greater Yellowstone Ecosystem, the Basin Study area provides habitat for a variety of large and small mammals and birds. Bears, deer, moose, and elk are found mostly in the forested uplands and canyons. Small mammals such as beaver, river otters, raccoons, marmots, bats, and a large variety of rodents are year-round residents across the entire Study Basin area. Fish in the rivers and creeks draw hawks, osprey, owls, kestrals, and eagles to nest in the area during the summers. Columbian sharp-tailed grouse are found throughout the watershed in suitable grassland steppe and agricultural habitats and are considered a species of concern by the U.S. Fish and Wildlife Service and a sensitive species by the U.S. Forest Service and Bureau of Land Management. The northern goshawk has been seen in the Basin Study area and is considered a sensitive species by the U.S. Forest Service (Reclamation 2006). The Henrys Fork River basin is located along a portion of the Pacific waterfowl flyway. Over a million waterfowl migrate through the area in spring and in fall, with large concentrations of ducks and geese around Island Park Reservoir and Henrys Lake. Trumpeter swans utilize the open waters of the Henrys Fork River basin, which is the primary wintering area for most of Canada's trumpeter swan population. While no longer listed as endangered or threatened under the Endangered Species Act, their populations are still rebuilding (IWRB 1992).	Underlined text added

Comment No.	Page	Line	Comment	Response
60	10	1-6	Replace with language from Idaho Fish and Game, as follows: Historic YCT distribution extended from central Wyoming and Montana, southwest through the Snake River watershed, downstream to Shoshone Falls in Idaho. Like many other native western trout, YCT have experienced declines in abundance and distribution due to hybridization or competition with nonnative trout, habitat alteration, and over-exploitation. YCT are currently designated as an Idaho *Species of Greatest Conservation Need* (see http://fishandgame.idaho.gov/public/wildlife/cwcs/) and garner management priority within their native habitat in drainages across the eastern portion of the state. Idaho's YCT stronghold is the Upper Snake Region. The aquatic systems most important for regional persistence of YCT include the Teton River, particularly the canyon reach and its tributary Bitch Creek; and the South Fork of the Snake River from Palisades Dam to the confluence with the Henrys Fork River. Research has determined that the success of YCT in these areas is directly connected to the flow regime present in these portions of the Henry's Fork Basin. Specifically, native YCT thrive in tributary streams with a high ratio of maximum late spring discharge to previous winter minimum discharge (i.e. - high peak flows and low base flows), such as Bitch Creek. (VanKirk 2005). On the other hand, "hydrologic regimes characterized by high winter flows and a low ratio of maximum late spring discharge to previous winter minimum discharge are associated with a high degree of rainbow and brook trout invasion success…." (VanKirk 2005). The underlined language is taken from Idaho Fish and Game's spring 2012 Upper Snake River Conservation newsletter, page 3. I have attached that newsletter to the e-mail containing these comments. It could also be instructive to add information relevant to the 2006 listing petition. Additionally, it would be useful to include a set of maps outlining the locations of YCT in the Henrys Fork Basin. See Jim De Rito's presentation from the YCT symposium in November. If you are unable to locate his presentation or the YCT maps, specifically, please let me know and I will send them to you.	Much of this comment was addressed with Van Kirk's previous comment and changed in the Needs Assessment. Reclamation originally included one of recommended maps (or one very similar) and determined it was too hard to read. The State's YCT conservation plan is included as a reference. This has several YCT distribution maps.
61	10	1-2	Can cite that this reference (Van Kirk and Jenkins 2005) for YCT declines is specific to the Teton River subbasin. For a watershed-wide perspective, then see Jaeger et al. 2000 (Distribution and status of Yellowstone cutthroat trout in the Henry's Fork watershed; Intermountain Journal of Science). To cite a more recent, but still draft status of YCT, then the presentation by DeRito et al. during the Henry's Fork Watershed Council can be cited from November 2011.	Line 1 -> In the Teton basin, the native Yellowstone cutthroat trout … Added Other changes per VanKirk's previous comments are also applicable
62	10	1	YCT section lacks important information regarding the species – previous petitions to list on ESA, most recent YCT status reports (Jim DeRito, Jim Gregory, and Lee Mabey), designated as an Idaho "species of greatest concern" by Idaho Department of Fish and Game, with note of current populations in decline and potential for new petition for ESA listing. Mention of core and conservation populations, specifically on Bitch and Canyon Creeks. Jim DeRito might be the best source for HF status information.	Added statement after line 8 -> As a result of the Yellowstone cutthroat trout population decline, the Idaho Department of Fish and Game has designated the Yellowstone cutthroat trout as a species of greatest concern. IDFG's *Management Plan for Conservation of Yellowstone Cutthroat Trout in Idaho (IDFG 2007)* provides detail on YCT population status, distribution, habitat, history of endangered species act actions, threats, and management actions.
63	11	15-17	the volcanic flows originated in the study area about 2.1 to 1.6 million years ago, not from the Yellowstone Plateau (major flows weren't from the park until the earliest time cited - 600,000 years ago).	Replaced with "Geology in the Basin Study area was formed by volcanic cycles and flows that left the Island Park basin layered with primarily rhyolitic magma which fractured and allowed basaltic magma to erupt and flood the floor of the basin. The Island Park basin is part of a series of calderas that formed over a span of 2 million years (Christiansen 1982)."

Comment No.	Page	Line	Comment	Response
64	11	25-27	The referenced IDWR 1978 report covers only the upper Henry's Fork watershed, defined as the watershed upstream of Ashton. Within that subbasin, it is true that alluvial deposits are thickest on the Henry's Lake flat and are generally very thin elsewhere. However, this geographic area does not include the main valley areas of the watershed, including Teton Valley and the entire agricultural area between Ashton and Rexburg. In these areas, alluvial deposits are quite thick and host all of the important shallow groundwater aquifers. Cite Bayrd 2006. His thesis contains geologic maps that show extensive alluvial deposits in these valley areas of the watershed.	Change citation to (Bayrd 2006)
65	11	8	Add U.S. in front of Department of Agriculture, not to be confused with Idaho Dept. Ag	Done
66	11	8	Change tense on study since study is complete: "The hydrology of the HF watershed "WAS" studied.."	Done
67	13	2-6	This statement implies that the difference between basin surface supply (around 2.5 million acre-feet) and outflow as surface water (1.6 million acre-feet) is due completely to irrigation water withdrawal and use. This is not true. Even without irrigation, much of the surface flow would have ended up being lost from the lower Henry's Fork into the Eastern Snake Plain Aquifer. We have not yet been able to estimate exactly what that "natural" loss would have been (we're still working on it), but it is certain that even without irrigation, the net surface discharge at the bottom of the watershed would not be equal to the surface supply. Please replace this sentence with something like: "The natural flow regime of the…storage, and canal conveyances. Mean annual basin outflow over the past 30 years is about 1.6 million acre-feet, which is probably less than the basin's outflow would be under "natural" hydrologic conditions. However, modeling shows that the lower Henry's Fork would be a losing reach in the absence of irrigation return flow, so that under natural conditions, the basin outflow would still be somewhat less than the supply of 2.5 million acre-feet, due to river seepage to the regional Eastern Snake Plain Aquifer."	Done.
68	14	7-9	The use of the terms 'gains' and 'losses' may be misleading here. In a hydrologic sense, 'gains' and 'losses' typically refer only to exchange with groundwater. In a water rights administration context, 'gains' and 'losses' may refer to the unaccounted change in flow after adjustment for diversions and measured tributaries, so 'gains' and 'losses' may include groundwater exchanges as well as unmeasured tributaries and irrigation returns. In neither case would one expect 'gains' and 'losses' to also include irrigation diversions and inflow from major tributaries. Inspection of Figure 4 indicates that the 500 to 2,000 cfs of 'gains' referred to on lines 7 and 8 is actually the amount by which the Rexburg gauge flow exceeds the Ashton. This difference would be the net of Teton River contributions, ungauged tributaries, irrigation diversions, irrigation returns, and exchange with the aquifer. Similarly, Figure 4 indicates that during the summer, flow at Ashton exceeds flow at Rexburg. This difference is also net of all inflows and outflows. The final sentence would be more consistent with hydrologic practice if it were <u>"During July, August and September, irrigation diversions exceed gains from the aquifer and tributary inflows, and the flow at Rexburg is less than at Ashton."</u>	Underlined sentence inserted over the "losing reach" sentence.
69	14	8-9	The statement that this is a losing reach in the summer contradicts Figure 8, page 18.	See above

Comment No.	Page	Line	Comment	Response
70	14	8-9	It is obvious that a river reach will lose water during irrigation season when there are large volumes of water being diverted, but this is not how the term “losing” is usually used in groundwater hydrology. A losing reach is one that loses water to the aquifer because the hydraulic gradients force water away from the river rather than towards it. During irrigation season, in fact, the lower Henry’s Fork is a *gaining* reach from groundwater because irrigation seepage creates large gradients that move water back into the river; it loses water only because diversions outweigh the groundwater return component. Please reword this to reflect the fact that the river actually gains water from the local aquifer during irrigation season but that net loss of surface flow in the river is due to irrigation diversion outweighing these groundwater gains.	See above
71	14-16	Lines 4-9 on page 14 & Figures 4-6	Need to add a hydrograph of upper Teton River (i.e. – Teton River at S. Leigh Creek gage) to paint the entire picture. This hydrograph could likely be added into Figure 5. S. Fork & N. Fork are below the main stem and thus are not representative of upper Teton Valley hydrograph and flows.	Comment noted. This chart is intended to only represent the most downstream gaging station in the Teton River. Note: data from the S. Leigh gaging station is shown in the “Conservation Alternatives Tech Memo”.
72	15	Figure 5	Add a description to the text or caption regarding "North Fork of Teton River (adjusted)" describing the basis or meaning of the adjustment.	Text from reference source provided to clarify
73	15	Figure 5	Clarification needed here. What does the North Fork of Teton River (adjusted) mean? Does “adjusted” refer to “regulated” – i.e. river flow when water is being withdrawn for irrigation? I would re-word to say “regulated” if that is the case. If not , explain what adjustment means.	See above
74	15	Figure 5	Need to explain the North Fork Teton River (adjusted), if going to use this figure.	See above
75	16	9-11	The Van Kirk and Jenkins citation is not relevant here. That report was focused solely on Teton Valley, and it is used here in reference to the whole watershed. Also, the majority of conversion from flood to sprinkler irrigation occurred between about 1980 and 1990, not over the last 10 years. Please see and cite the report from our USDA grant regarding sprinkler conversion. I’m including it again for reference.	Deleted the current reference. Changed line 9 to say that the majority of flood to sprinkler conversion happened from 1980 to 1990. Cited as a source “Components of Irrigation Water Budget Related to Sprinkler Application” cited as Van Kirk 2012b
76	16	3	This section could benefit from a discussion of the huge role that the rhyolite aquifer of the Yellowstone plateau and the basalt aquifer of Island Park play in the natural flow regime of the Henry's Fork at Ashton. Because it is a groundwater dominated system it exhibits both lower seasonal variation and greater resilience to drought than a snowmelt dominated system. Paradoxically this is one of the reasons rainbow have been able to compete against native cutthroat in the Henry's Fork.	Line 5 – added after temporally -> The rhyolite aquifer of the Yellowstone plateau and the basalt aquifer of Island Park play a role in the natural flow regime of the Henrys Fork at Ashton. Because it is a groundwater dominated system it exhibits both lower seasonal variation and greater resilience to drought than a snowmelt dominated system.
77	17	4	Specify what “reach” you are speaking of.	Line 4 – Deleted – in this reach
78	17	Figure 7	Note in figure citations that this for the Henrys Fork at Rexburg gage (USGS)? Also put in citation that these are the relative contributed portions by watershed area?	Changed figure citation to – 30-year mean flows and river reach contributions to flows on the Henrys Fork River measured at the Rexburg gaging station.
79	17	Figure 7	Note in figure citations that this is for the Henrys Fork at Rexburg gage (USGS)? Also put in citation that these are the relative contributed proportions by watershed area?	Same comment as above

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80	17-18		Figure 8. I have much more current and detailed information on reach gains from groundwater. These figures are in a spreadsheet I will send you. IDWR's estimate of 80,000 acre-feet per year in GW gains is probably about right for an average over the past 20 years, but those gains have decreased dramatically since 1979 (see my graphs).	Comment noted. We will considered new information as it is received. Hovever, the graph as shown is correct.
81	18	9-12	The 40% flow at Ashton is from groundwater spring sources not from irrigation recharge. This sentence might be better further up in the introductory materials such as the description of the basin? The sentence is out of place within this paragraph that is about irrigation recharge.	Relocated the two sentences found on lines 4 thru 8 pg 18 and place them at the end of the paragraph ending on line 10 pg 16.
82	18	19-21	This statement must be qualified as it isn't true for Teton Valley. Water diverted for irrigation in Teton Valley returns to the main stem of the Teton River, helping to mitigate the impacts resulting from irrigation diversion DOWNSTREAM. However, the water doesn't return to the headwater tributaries where it is needed to complete life histories, specifically for spawning and outmigration. It may be best to simply delete this sentence. Alternatively, it could be reworded as follows: "Irrigation seepage returns to the river via groundwater pathways help provide additional water to downstream irrigators during late-summer."	Deleted this sentence ->Irrigation seepage 19 returns to the river via groundwater pathways help mitigate the effects of diversions on late-20 summer flows on fish and wetland areas (Van Kirk et al. 2011).
83	18	13	Line 13 suggests annual gains from GW of 80,000 acre feet, but summing monthly values from Figure 8 suggests gains of approximately 300,000 acre feet.	Change – Note that there is an estimated range of 80,000 acre feet to 285,000 acre-ft (estimate using Figure 8) and which number is from which source.
84	18	17	This line implies that most or all canals were lined. A few in Teton Valley and a few above Ashton have been put in pipelines but I think lining is not widespread.	Inserted "some of the canals…"
85	19	9-11	Qualify: the 2.1 million "irrigated" acres to discern that not talking about total acreage (including non-irrigated) above the aquifer?	Change line 9 -> Of the 2.1 million irrigated acres on ….
86	19	15-17	This reference seems to be outdated given all the recent work that has been done on the ESPA. Is there a more recent estimate of Henrys Fork basin contributions?	Noted -
87	19	7	Recharge to the ESPA is believed to have increased during the first half of the 1900s and decreased during the second half. It is unlikely that the decline started any earlier than 1948 or 1949.	Changed line 7 -> decreased since the mid-1900's
88	20	29-31	Could say that the Drought Management Plan specifies that Reclamation and FMID will consult with NGO's and state and federal agencies in setting the timing and quantity of winter flows. FMID would prefer to not have specific volumes of out flow from Island Park Dam either minimum or maximum.	Added the following sentence after line 32. -> As part of the Drought Management Planning, begun in 2005, Reclamation and FMID consult with local interest groups and state and federal agencies in setting the timing and quantity of winter flows.
89	20	29-31	There is no target release (300 cfs) and there is no lower limit (100 cfs) since Drought Management Planning (DMP) began in 2005. This would be a good place to discuss the Drought Management Plan (DMP) process? However, the DMP process applies more broadly to water management in the Henrys Fork, not just Island Park Reservoir.	Same comment as above
90	20	6	Water is stored primarily during the winter (certainly in Island Park Reservoir, which is the largest of the three reservoirs), as the next sentence states. Delete "during the high-flow season of the year"	Deleted the phrase as suggested
91	20	12	Could say, "NFRC owns the dam and reservoir, and operates the same as part of the Minidoka project".	Reworded: NFRC owns the dam and reservoir, and operates the 90,000 acre-feet of storage in conjunction with the Minidoka Project.

Comment No.	Page	Line	Comment	Response
92	20	23	Better to note that Island Park Reservoir is located next to the city of Island Park, so as to not confuse with Ashton Reservoir that is closer north of Ashton?	Took out Ashton verbiage
93	20		The section on Island Park operation (p 20) does not address the Drought Management Plan, and minimizes the weight of this plan on flow release decisions. Also, there is no discussion on timing and importance of flows. I also don't think there is a target of 300 cfs any longer – it's now to release as much water as possible and still meet storage targets. This is an important point to make. This section can be improved by a discussion of the role of winter flows on fish populations, and how that translates into economic importance to the region.	An additional paragraph discussing the drought management plan was inserted on page 21..
94	21	25-27	This sentence is confusing. Reword as follows: "Exchange well pumping and additional exchange well development may impact the Henrys Fork River and Snake River by slightly decreasing river flows and FMID may have to mitigate for that decrease."	Change – Delete -> Impact to the Henrys … for that reduction. ADD Exchange well pumping and additional exchange well development may impact the Henrys Fork River and Snake River by slightly decreasing river flows. Note: the issue of potential mitigation has not yet arisen and any negative impact to flows by anybody for any reason may require mitigation. It is not within the scope of this needs assessment to point out potential legal requirements which may be placed on FMID.
95	21	2-4	If water is going through the Island Park Hydroelectric Project, then the ramping rate limits are set in accordance to the project license with Federal Energy Regulatory Commission.	Changed sentence to: Ramping rates and schedules are in accordance with the project's Federal Energy Regulatory Commission license.
96	21	25-26	Consider wording such as "Some effects of exchange well pumping may propagate to the Henry's Fork and Snake River during the irrigation season when pumping occurs, and Fremont Madison may be required to mitigate for these effects." However, FMID would prefer to delete this entire statement. Until the groundwater model is refined we don't know of any reason why FMID might need to mitigate since all of the FMID area is outside the trim line.	See above response to FTR
97	21	5	I believe the Cross Cut Diversion Dam has been replaced with a bladder dam and now has a power house & fish passage.	Update from the SRFO: The dam will remain as a concrete weir when the inflatable extension is installed. The modification is planned as flows allow after mid-September 2012.
98	21	29	Delete "in the early stages of development in the Basin Study area" and replace with a time and location (late 1800's?)	Changed to "Starting in the late 1800s"
99	21	31	Consider ending this sentence: "so that little initially reached its intended destination." Then consider modifying the next sentence something like: "Soon, however, it was learned that these irrigation attempts elevated the local water table into the root zone. Utilizing this geologic phenomenon, pioneer farmers developed a subirrigation practice which carefully managed this shallow aquifer created by irrigation diversions."	Done

Comment No.	Page	Line	Comment	Response
100	21		Teton exchange wells (p21) – in this section, it makes the point that the extra 30,000 af pumped from the ground and put into the Henrys Fork doesn't do anything for instream flows since it replaces water diverted upstream. This technically may be correct from an accounting standpoint, but is incorrect biologically. Probably worth addressing. The exchange wells section also states that during low water years, 30,000 af are pumped, although the wells are permitted to take as much as 80,000 in low water years. That's a substantial amount of water (50,000 af) that is available without building a new dam…	Line 18 states that if does not provide a benefit not that it doesn't do anything. Add new sentence near line 25. -> While 80,000 acre feet are the maximum permitted, the wells have only been developed to deliver 30,000 acre feet. Reclamation will raise the question to the State of the potential use of the 50,000 acre feet permitted, but not yet developed.
101	22	30-35	4(?)/6 hydroelectric projects were constructed in the past 20 years: Island Park, Fall River, Chester, and Felt (?).	Changed line 31 -> Chester Dam on the Fall River, Felt Dam on the Teton River and a new hydroelectric facility at the Cross Cut canal provides additional hydropower generation. Deleted from line 32 -> Together, these facilities .. thru line 35
102	22	13-15	Would be informative to cite the Henrys Fork basin contribution (FMID) and payments received for these amounts.	Changed line 21 to -> 13,620 acre – feet was delivered by FMID to the Egin Lakes .. Note – no need to mention dollars
103	22	30-32	The Buffalo River Hydroelectric Project is on the Buffalo River, not the Henrys Fork. Chester Dam is on the Henrys Fork, not the Fall River.	Text reworded to correct misplacements.
104	22	5	Recharge has been studied since at least the 1960s. Cite the circa 1962 USBOR study, which I believe is included in the project documentation archive.	Changed line 5 -> reservoirs has been extensively studied, but mostly …
105	22	29	Should this section include the new power plant at the Cross Cut Diversion Dam?	See change in line 31 response to HFF above
106	22	29	There is no mention about the existing hydropower facility on the Teton River near Felt.	Inserted.
107	22	31	The Chester Dam is on the Henry's Fork not Fall River.	See above.
108	22		Under the hydropower section (p22), they identify the Chester Dam as being on the Fall River – it's actually on the Henrys Fork. They also overlook the Marysville Hydro on the Fall River. They state the Buffalo hydro diverts water and returns it to the natural channel – in actuality, it returns to the Henrys Fork, not the Buff. There must be an error in capacity too, as the Buffalo Hydro produces 2,000 mw each year, and the IP Hydro is rated at 4.8. perhaps this is a scale issue, and IP produces that daily?	Changes are noted above. Also, add the Fall River Hydro plant on the Marysville canal which is diverted from the Fall River.
109	23		For a more complete description of hydro-projects in the Basin Study area, the St. Anthony Hydro on the Henry's Fork owned by Pacific Corp (currently is not operational), the Marysville Hydro owned by Ida West on Fall River and the Felt Hydro on the Teton River should also be included.	Done.
110	23		Include descriptions of the Fall River Hydroelectric Project and the hydro project at Felt on the Teton River on this page as well.	See change in line 31 response to HFF above

Comment No.	Page	Line	Comment	Response
111	23	9-11	Construction began on Chester Dam Hydroelectric Project in 2009. Probably should cite Fall River Electric website for source information for this information, not the Henry's Fork Foundation website.	Done.
112	23	8-9	The Chester Dam is on the Henry's Fork not Fall River. Should also say "From 2008 to 2012" instead of "In 2008".	Done.
113	23	12-13	The Buffalo River Dam diverts a constant 100 cfs through a hydropower generating facility and discharges this flow to the Henrys Fork." Water through the turbine doesn't go back to the Buffalo River.	Changed line 13 -> before discharging the flow to the Henrys Fork river.
114	23	4	Ashton Dam also received LIHI certification in 2010.	Inserted.
115	23	17	The Buffalo River Hydroelectric Project is also certified by the Low Impact Hydropower Institute and should be mentioned here, similar to Island Park Hydroelectric Project.	Text was added to each facility's paragraph ADD after line 17 -> the Island Park, Ashton, and Buffalo River hydropower facilities are both certified by the Low Impact Hydropower Institute. http://www.lowimpacthydro.org/certified-facilities/
116	23	8-9	there are several erros. Chester dam on the Henrys was retrofitted in 2010	
117	24	7	After …"will maximize reservoir storage" consider adding, "by keeping storage in the most upstream reservoirs".	Done
118	25	12-15	Water is always stored high regardless of drought conditions, but more is stored during the winter during drought conditions. Also, with the Drought Management Plan process, even during drought conditions, water can be flexibly managed below IP Dam to benefit juvenile rainbow trout survival by delivering as much water as possible from about December through March.	Lines 12& 13 – Deleted -> During drought conditions Rest of comment noted.
119	25	24-26	This extrapolated estimate would then be for all irrigated acreage in the basin (not just the other 23%)? If so, then delete "other" from sentence.	Done
120	25	24-26	This extrapolated estimate would then be for all irrigated acreage in the basin (not just the other 23%)? If so, then delete "other" from sentence.	See comment above
121	25	10-11	Reword sentence as follows: "During years with drought conditions, many of the irrigators in the FMID have inadequate water supplies. This is a function of the prior appropriation doctrine and general western water law principles established at the turn of the century, which hold that in drought years only those water users with senior water rights can irrigate, leaving junior water right holders without water."	Comment noted. Note: all diversions are subject to Idaho water law. Also – later in this same section a more through explanation, particularly Table 8, gives the background data for this statement.

Comment No.	Page	Line	Comment	Response
122	25	4	Reconcile acreage with page 1 line 11, page 24 line 9, page 24 Table 6.	No change Note: These figures don't represent the same thing Pg 1 Ln 11 – over 200,000 acre –feet irrigation – whole watershed Pg 25 line 9 -181,000 acres within the four major canal areas Pg 25 Table 6 – 181,000 acres within canal areas.
123	25	Table 6	Fremont, not Freemont	Done
124	25	10	Replace sentence with.. "During years with drought conditions, many of THE JUNIOR water rights in the FMID are inadequate for current agricultural practices."	Comment noted. Note: all diversions are subject to Idaho water law. Also – later in this same section a more through explanation, particularly Table 8, gives the background data for this statement.
125	25	12	How are "drought conditions" defined? Please include the definition. If that definition is "years with water supply in the lowest third of the distribution of supply," then by definition drought years occur 1/3 of the time. What sort of statistical analysis was used?	See comment to HFF above – the term during drought conditions has been removed.
126	25	4 & 9	Irrigated acres don't seem to match – if 77% is 181,000 than 100% is 235,000 not 285,000 served by FMID. Need corrected numbers or an explanation.	Not all of the 285,000 acres served by FMID are within the Henrys Fork Basin. The 181,000 refers to irrigated acres within the Basin as shown in the "regions" developed by Dr. Van Kirk. Not all of the irrigated regions are served exclusively by FMID
127	25	17	These aren't the four "main" (largest?) diversions from the Henrys Fork. The St. Anthony Union (different from the Feeder) and Cross Cut canals are the largest canals in terms of both capacity and total annual volume diverted in the Henrys Fork basin. Check with Rob Van Kirk for an update if you want to use the largest diversions or if you keep the figure, then delete reference to "main".	No change. This statement only refers to the reach on the Henrys Fork River between Ashton and Rexburg. The St. Anthony Union canal is upstream of Ashton. These are the only four canals shown on Dr.VanKirk's irrigation schematic on page 27 for the canal irrigated regions. Dr. VanKirk only considered canals of sufficient size to warrant inclusion. Undoubtedly there are some other minor diversions within this reach. I'll double check with Dale.

Comment No.	Page	Line	Comment	Response
128	25	21	This would be a good place to include the overall total diversions for the four irrigated regions from Van Kirk et al. for that period of study (1977 – 2002) and the trend during that time. The overall trend has been a decrease in the amount of water diverted. The reason for this trend is generally cited to be the transition from flood irrigation to sprinkler irrigation. This brings up a related item to include the amount of acreage currently flood irrigated versus sprinkler irrigated for the watershed.	No change Table 6 provides the average annual diversions for the four irrigated regions for the period of study but not the trend. Reclamation has the raw data of canal diversions daily for the 30 year period of study ending on 9/30/2008 so a trend analysis is possible, portably with a full days effort. This effort is considered beyond the scope of the Needs Assessment. The issue of diversion having been decreasing over the study period was addressed in the first paragraph page 19.
129	25	22	Including an ac-ft per acre column would aid in understanding the difference in water supply for these different sized regions.	ADDed column to Table 6 as suggested. Values are: Egin Bench 12.1 Lower Watershed 8.8 North Fremont (correct spelling) 1.3 Teton Valley 1.8 Total Watershed 6.3 Units are ac-feet per acre
130	25	25	The assumption that the entire basin has similar diversion rates to the four areas may overestimate total diversions. The additional irrigated areas are likely to be higher elevation and therefore have both lower ET and higher rainfall, and they are likely to be supplied by small streams with no storage and therefore low late-season supply.	Note change in comment above
131	25	26	“the other” should be “all”	Done.
132	25		In the section on agricultural water use (p 25), they state that the 77% of the HF basin where they have measured water use diverts 1.1 maf of water per year. They then go on to state that if diversion rates are equal, that the remaining 23% of probably divert 1.4 maf of water per year. So how could 23% of the land use more water than the heavily irrigated 77% that we know about? Perhaps this should be 1.4 maf total for the HF basin, and that the 23% unknown likely diverts 338kaf. This should be clarified.	Change line 26 1,4371,320 acre-feet are diverted annually for all the irrigated lands in the Henrys Fork Basin
133	27		Is this the current number of USGS gages on Figure 10? It looks like there are more of them than are now active. Perhaps check with USGS about the location of active gages. There may be gages on canals included which are operated by Water District 1.	Figure 10 was corrected by GIS
134	27	Figure 10	Teton River at South Leigh Creek is the USGS gage above confluence of Teton River and Bitch Creek. No gage on Bitch, Badger, Teton, etc.	Figure 10 was corrected by GIS
135	27	Figure 10	Also show pumps located on the Fall River, Conant Creek, and Squirrel Creek? If not, then rename the current legend as ~ "Teton River pump sites upstream of splitter"? Note that the USGS gages are historic and current in legend. The light green is "FMID irrigated acreage" not FMID boundary? Inset map in upper left corner: decrease northern boundary of highlighted area to just north of Ashton.	Figure 10 was corrected by GIS

Comment No.	Page	Line	Comment	Response
136	29		Table 7. These crop ET figures are a little higher than what I have estimated. I'm guessing that the difference is because I removed precipitation from the crop ET demand, and these figures are just raw crop ET. I have calculated that precipitation meets around 10% of the seasonal crop ET demand across the watershed—higher in some areas than others, of course. If you want to continue to use the figures in Table 7, please report that these are gross values and do not reflect the amount of ET met by precipitation, and then indicate that precipitation meets about 10% of demand. In the latest water budget figures, I include estimates of amount of crop ET met be precipitation. This was done at the request of Bryce Contor, who reviewed my data for you.	Leave this as raw data. The data source is given.
137	29	13-15	Add language: "Due to the increased efficiencies…, AND CHANGES IN AGRICULTURAL ACREAGE, the total diversion in the basin have decreased…."	Done.
138	29	4-8 and Table 7	Table 7: What are the units? There doesn't appear to be much difference between the two sites in 2011: all four crops totaled are 96 (units?) for Ashton and 100 for Rexburg. Depending on what the units are, is this really that big of a difference? If not, then the text describing table should be adjusted or find another year to point out the differences noted in the text.	Unit is inches (added). Reworded text: The location of irrigated lands in the Henrys Fork watershed also slightly influences the amount of water needed by crops for the best harvest.
139	29	9	Units in table need to be labeled, probably inches	See comment above.
140	29	9	Table 7. There isn't a metric present on the "estimated total crop water use" Days, acre-fee, % diverted surface water?	See comment above.
141	29	6 & 7	Temperatures should be labeled, presumably °F	Done.
142	29	10 & 11	This leaves only 3% for surface runoff – that is low for 100% sprinklers and this document suggests currently about 70% sprinklers.	Comment out of context related to lines 10 & 11?
143	29	Table 7	does not provide units of measure – I assume it's inches of water, but I don't know for sure. Please provide units.	Include the unit (inches) in the Table 7 title.
144	30	15	The statements in this paragraph should be qualified, similarly to comments relevant on page 25, lines 10-11. The statements assume that each acre put under irrigation could reliability be irrigated each year. That is not the case. This is a prior appropriation state, in drought years only those water users with senior water rights can irrigate, leaving junior water right holders without water. That is simply a function of the system, a system which was established at the turn of the century. As such, this statement should be reworded as follows: "An analysis of actual irrigation diversions in recent years indicates that even with the more efficient irrigation methods, FMID does not have a sufficient water supply to satisfy the needs of all water right users during average and less-than-average water years, with the extent that shortages varying between individual canal companies that make up FMID (Table 8). <u>This is a function of the prior appropriation doctrine and general western water law principles established at the turn of the century, which hold that in drought years only those water users with senior water rights can irrigate, leaving junior water right holders without water.</u> Ignoring this basic principle, and assuming that that each acre put under irrigation can reliably be irrigated each year, during an average water year the current unmet needs for irrigation are estimated at more than 80,000 acres-feet or 23 percent of the total water needs (Table 8). …"	Inserted the underlined and reworded the next sentence: "This is a function of the prior appropriation doctrine and general western water law principles established at the turn of the century, which hold that in drought years only those water users with senior water rights can irrigate, leaving junior water right holders without water. During an average water year and without regard to water right priorities, the current unmet needs for all of the irrigated lands are estimated at more than 80,000 acre-feet or 23 percent of the total water needs.

Comment No.	Page	Line	Comment	Response
145	30	3-15	While it is correct to say that the “total water needs” are “unmet,” this insinuates that every water right in the state, or at least in the Henry’s Fork basin, is created equally. This section fails to recognize that Idaho is a prior appropriation state, and that water is distributed based on “first in time, first in right.” We are often told that Idaho’s water is not overappropriated because the prior appropriation doctrine gives priority to the oldest rights. If this is the case, then there is little case for unmet needs. This system has been in place for more than 100 years and has worked effectively for Idahoans, and junior water right holders have effectively planned their plantings based on estimated water availability.	See above
146	30	3-6	The text refers to “individual canal companies”, but Table 8 is for “irrigated regions" not individual canal companies.	Reworded.
147	30	11-13	Isn't water able to be “traded” among the regions so that physical delivery is not necessarily needed?	Delete this sentence. Even if the surplus water …
148	30	7-9	Again, indicate that growing-season precipitation meets some needs. Furthermore, in the deep, finer soils in the North Fremont area, stored soil moisture meets quite a bit of demand, although I did not include that in any of my models. You should also point out that these demands are theoretical maxima, under the assumptions that every acre that has irrigation water rights is irrigated for the entire season every year. This is not done in practice, nor has it ever been done. I don’t disagree with these demands as theoretical maxima, nor do I disagree that if we had more water, more crops could be grown by allowing maximum production on all possible acreage every year. However, I would like to see a little more context here to explain that certain areas of the watershed have never had full supply to irrigate every acre every year, so these demand calculations are really theoretical and represent a maximum-production scenario, not the reality of how crop production has occurred in the region over the past 120 years.	The term “water years” implies precipitation. In a below average water year, there is not enough water supply or precipitation to meet the needs.
149	30	16-17	cite Van Kirk et al. for Table 8 reference	Reclamation developed this table.
150	30	19-20	Is it true that the Basin Study is refining estimates of irrigated acres and canal loss? This statement might need further clarification	Reworded with: This estimate is expected to be refined during future analyses of the Basin Study.
151	30	9	replace "county" with "irrigated region"	Done
152	30	10	replace "but" with "and"?	Made 2 sentences.
153	31		Table 8 (and a few other places in the document). Change “Freemont” to “Fremont” and do a global search-and-replace to make sure “Fremont” is spelled correctly throughout.	Done.
154	31	Table 8	It would be clearer if column 3 were identified as consumptive irrigation requirement of crop ET if that is the term used elsewhere. Also, the Teton diversion under drought conditions is not reduced from the average year supply and probably should be.	Column 3 is not ET but rather ET minus effective precipitation or “Irrigation Required” as labeled.
155	31	Table 8	Fremont, not Freemont	Done

Comment No.	Page	Line	Comment	Response
156	31	Table 8	In table 8 on Page 31, there is a column called acres, and my assumption is that this is the total amount of irrigated acres with water rights in a specific region. This is likely different than the total amount of acres in production in any given year. As such, the need is an overestimate of actual need and is misleading. Further, water rights were developed to address water shortages. Attempting to meet overallocations of water with a new dam isn't really addressing need – it's addressing overallocation – a completely different need. In short, this section oversimplifies the need in the basin. To be more accurate, this table should present the average number of irrigated acres in production annually, which would incorporate rotational fallow, pasture use and all the other low demand uses. Alternatively, it would be very interesting to see the water rights that are allocated for each of the regions shown, and equate that to the amount diverted. I suspect more water is diverted than is allocated, but would have to see the data to ascertain that. Regardless, our target for this project should be actual demand shortages (priority one) followed by total allocation via water rights (priority two).	Table 8 applies standard procedure for estimating water shortages based on acres with irrigation rights. Page 30 lines 16 through 20 explain the limitations to these calculations. On page 38 – lines 27 through 33 explains the concept of rotational fallow, supplemental irrigation, etc. which are known to be practiced in the Henrys Fork and are described as methods currently used to mitigate water shortages. The use of a new dam is not mentioned in the Needs Assessment and has no relevance to the data presented in Table 8. Table 8 uses actual historical diversions. No comparison to actual diversion, in conjunction with water right allocations was made.

Comment No.	Page	Line	Comment	Response
157	32	6-8	This statement is absolutely wrong. Idaho water law does provide mechanisms for leasing excess flow instream. The following language came from the USDA booklet put together by Van Kirk's team and accurately describes the opportunities to lease water instream in Idaho. "Throughout the Henry's Fork Watershed, canal companies and landowners with water rights are beginning to work together with a variety of partners to explore site-specific, non-traditional water use options. Potential partners in this work include the Idaho Department of Water Resources, Idaho Fish and Game, the Idaho Water Board, the Henry's Fork Foundation, Friends of the Teton River, the Natural Resource Conservation Service, and/or city and county governments. One non-traditional use option includes leasing unused water into the Idaho Water Bank. The Idaho Water Bank was set up specifically to help water users retain their water rights by leasing unused water into the bank. Individuals or canal companies can temporarily lease a portion of a water right into the water bank, and may receive a payment for doing so. These leases are quite flexible, and can be partial season, temporary or full season leases. For agricultural irrigators, leasing excess water can be a way to increase profits. For developers or homeowners, water leasing can be a way to retain water rights when land use changes, and may increase the value of land. In many cases, leased water can also be used to improve flows for fish and wildlife. Other non-traditional water uses include participating in designated aquifer recharge projects, and reducing water consumption through programs such as those offered by the Natural Resource Conservation Service and the Idaho Department of Water Resources. Additionally, water rights holders may also be able to participate in a variety of site-specific water use changes that may maintain or increase agricultural water availability, while also restoring instream flows in key ecological reaches. These may include point of diversion changes, source water switches, wastewater re-use, and other options. In cases where there is a significant benefit to species of concern, water right holders may receive assistance with funding a portion of or even the entire project."	Delete sentence beginning at the end of line 6. Idaho State Water Law …, and insert and note the language from Dr Van Kirks USDA Booklet (2012). Throughout the Henry's Fork Watershed, canal companies and landowners with water rights are beginning to work together with a variety of partners to explore site-specific, non-traditional water use options. Potential partners in this work include the Idaho Department of Water Resources, Idaho Fish and Game, the Idaho Water Board, the Henry's Fork Foundation, Friends of the Teton River, the Natural Resource Conservation Service, and/or city and county governments.
158	32	7-8	The statement that "Idaho State Water Law does not provide a mechanism for leasing excess flow in order to restore instream habitat or provide other benefits" is not accurate. Idaho has the existing Idaho Water Supply Bank and thousands of miles of minimum stream flows throughout the state. The Idaho Water Resources Board regularly leases water in the state to benefit fisheries, and both TU and the IWRB have completed water transactions through nondiversion agreements that have directly protected excess flows to benefit fish. Also, the Henry's Fork Drought Management Plan, which was mandated by Congress as part of the title transfer of Henry's Fork diversions and the Island Park Dam, has resulted in FMID increasing instream flows for fish every year (as noted on pages 34 and 35).	See above comment

Comment No.	Page	Line	Comment	Response
159	32	5-6	This statement is potentially incorrect when all factors such as amount of land use conversion, former and future crop vs. landscaping coverage, etc. are all considered. For example, water use on a residential lawn irrigated all summer would be higher than that on a pasture that is irrigated only a few weeks in the early summer. Again, in Teton Valley and North Fremont, all possible acreage that could be irrigated is not irrigated all season every year. If we replaced all of that land with lawns that are watered all season every year, water use would be much higher on the lawns. On the other hand, if land is subdivided for development, but the lots are never built on, and nobody ever puts in and irrigates a lawn, then that land would use less water than an irrigated agricultural field. Our result is very specific: on a per-acre basis, we found no statistical evidence that growing-season consumptive use of water differs between built-out residential lots and *irrigated* crop lands. Please change to reflect this very specific conclusion of our statistical analysis. I'm including this analysis again for your reference.	Reworded: On a per-acre basis, the conversion of agricultural water use to non-agricultural uses appears to have had no affect on the growing-season consumptive use of water between built-out residential lots and irrigated crop lands
160	32	3	Add "to" after sold.	Done.
161	32	6	Add following sentence. "While the conversion to non-agricultural uses appears to have no affect on the quantity of water being used, studies show that non-agricultural uses rely more heavily on groundwater than surface water."	Done
162	32	Fig. 12	Check color blob in middle of graphic	Not seeing it
163	32	7 & 8	Last sentence not universally true in Idaho, see special water bank provisions for Lemhi and Big Wood Rivers	See FTR comment above.
164	33	Table 9	The table shows the city of Ashton's groundwater comes from the "Teton Basin Aquifer". We believe the city of Ashton and most of the Ashton area is completely outside of the ESPA and certainly the city of Ashton's groundwater does not come from the Teton Basin Aquifer.	See cited source IDEQ 2011b: "DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Teton Basin aquifer in the vicinity of the City of Ashton."
165	34	13-15	Reword sentence as follows: The Idaho Department of Fish and Game, FMID, and Reclamation work cooperatively to provide winter releases from reservoirs on the Henrys Fork River (Island Park Reservoir and Henrys Lake) and Snake River (Palisades Reservoir) to promote high trout densities and quality fish habitat."	Inserted, but without the part about the Snake River since it's outside our study area.
166	34	4	Felt Dam also a run-of-river hydroelectric? The Fall River Hydroelectric is not run-of-river, but should it be noted here?	Paragraph reworded for clarity.
167	34	6	Delete "s" from "demands"	Done.
168	34	8	Chester Dam diverts water into two canals on either side of the Henrys Fork, not Fall River (dam and diversions are below the Fall River confluence).	Done.
169	34	9	Should be "Henry's Fork" instead of "Fall River". Also could include other hydro projects identified in comment for page 23.	Done.
170	34	Table 10	Public supply from surface water shows zero but Table 9 shows Driggs gets part of its supply from surface water	The City of Driggs public water system (PWS #7410004) consists of one main source (Teton Creek Spring infiltration gallery), three back-up source wells (Dalley Well, High School well, Lion's Park well), and the storage tank well (2001). 2009: This report evaluates Valley Center Well of the City of Driggs community water system. Apparently, the city replaced their SW source with GW. Changes to document were made.

Comment No.	Page	Line	Comment	Response
171	34	Table 10	Information relevant to Teton Valley is not accurate. 1: There are both surface and groundwater water withdrawals used to irrigate golf courses in Teton Valley. Teton Creek surface water is used to irrigate the Huntsman Springs golf course. Trail Creek surface water and other spring sources are used to irrigate the Teton Springs golf course. There are other golf courses in Teton Valley which must be irrigated by some source. 2: The City of Driggs obtains water to support its public water supply from a spring source (surface water) located on Teton Creek. This fact is accurately reflected in Table 9, page 33.	The table reflects water usage of 2005, before either of these golf courses were in operation. See previous comment about Driggs.
172	34	Table 10	Just wondering, is that correct that there are no water withdrawals for golf courses in Teton County	See comment above
173	34	13	As identified in comment for page 20, line 29-31 other organizations should be included in this statement.	Reworded to “Federal and State agencies, FMID, and local interest groups work cooperatively to set the timing and quantity of winter releases from reservoirs (Island Park Reservoir and Henrys Lake) that promote high trout densities and quality fish habitat”
174	34	13	Note "and others"...see the DMP process.	See above
175	34		in their draft – *Fish and Wildlife Water Use* – IDFG asks for a final review of this section before the final document comes out. They try to explain why drawdowns of Island Park res are bad for fish, and miss the mark. Fisheries in IP res suffer when the water leaves – it eliminates all habitat for aquatic species, including fish. No water means no fish, so when it is drained, the fish die. Along with that, there are likely impacts to the benthos and macrophytes that remain in the exposed sediments over the winter as freezing occurs. Additionally, winter flow releases from Island Park Dam are the #1 factor controlling trout abundance in the Henrys Fork downstream (Box Canyon is where our data is from, but it likely impacts fish down to Warm River and possibly further). More water equates to more fish. The statement that Reclamation works with fish and game is not accurate unless you include the clause “as possible while considering irrigation needs”. The paragraph just below this one (the 3rd paragraph) leads off with the statement that Reclamation releases water for fish “occasionally” which supports my comment above.	Changed as noted: Fisheries in the Henrys Fork River basin may suffer from ~~drought-induced~~ drawdowns of Island Park Reservoir which eliminates habitat and ~~most of the summer~~ benthic invertebrate production in the reservoir. ~~Low fall-winter flows in the Henrys Fork River below Island Park Dam and 5 below Henrys Lake may limit the fish habitat as well as late-summer flows in the Henrys Fork 6 River below St. Anthony and in the lower Falls River as irrigation water is diverted (IWRB 7 1992).~~ Winter flow releases from Island Park Dam are the primary factor controlling trout abundance in the Henrys Fork River. Reclamation cooperates with the Idaho Department of Fish and Game, as possible while considering irrigation needs, to ~~minimize these impacts~~ meet trout fishery needs.
176	34	13	I think this sentence is trying to capture broader release plans by IDFG and Reclamation (like Ecologically Based Systems Management?). FMID can be taken out here since the following paragraph discusses the winter efforts on the HF.	See above
177	35	13-17	There needs to be consistency with page 34, line 13 and page 20, line 29-31.	See above
178	35	32-34	Put this sentence in context, it seems to be just thrown into the paragraph. Maybe add a sentence or clarify why and when groundwater pumping would occur. Refer back to Bryce Contor’s paper to put this in context.	Change - Increased early-spring recharge …

Comment No.	Page	Line	Comment	Response
179	35	3-5	This is not the primary variable that may affect fisheries in the basin. The Henrys Fork below IP Dam has some of the best growth rates in the state of Idaho. In terms of loss of macroinverts in the reservoir from draw down of the reservoir that doesn't affect the Henrys Fork fisheries. What can affect the fisheries and fish habitat is the very low drawn downs of the reservoir that result in large amounts of sediment moving through at once to the river below (see Caldera Assessment). Also, very low drawn downs of the reservoir dictate that more volume is required to fill the reservoir during the winter, which does affect winter flows and juvenile trout survival (see Caldera Assessment).	Reworded: "Fisheries in the Henrys Fork River may suffer from drought-induced drawdowns of Island Park Reservoir which increases sediment below the dam and may affect the winter flows below the dam as the reservoir is refilling."
180	35	19-21	See prior comments about ramping rates and FERC.	Reworded: The ramping rates during those releases are determined by the FERC license; however, Reclamation also consults with the Idaho Department of Fish and Game to minimize damage to fish and swan habitat.
181	35	21-23	not a tactic that has been used recently, cite in the past... flows have been dropped in early winter (November and December) to as low as about 80 cfs (to facilitate water storage) during this period so that more water could be released in January through March (see Caldera Assessment).	Sentence deleted.
182	35	1-2	Note that all of these water rights (include dates) are junior? For example, the Henrys Fork: There is a 300 cfs minimum instream flow right on the Henrys Fork (water right number 21-7282) from the mouth of the Buffalo River downstream to below Mesa Falls. However, it has a priority date of 1981, which is junior, and therefore subordinate, to the storage rights in Island Park Reservoir, which have 1921 and 1935 priorities. In addition, the right specifically states that the right "…shall be limited to 300 cfs, or the rate of flow provided by the Buffalo River…. whichever is less." It also states that, "The right shall not be deemed to impose any conditions or requirements upon the operation of Island Park Dam." Therefore, in the final analysis the right simply precludes the storage of Buffalo River flows (base flow of ~ 200 cfs). - Text from the Caldera Assessment (page IX-18) by Jim Gregory (2008) available: http://www.henrysfork.org/shared/hff/files/pdfs/2008-06-13%20Caldera%20Desk%20Assessment_Final%20Draft.pdf	Added: In the Henrys Fork basin, the Idaho Water Resource Board holds minimum stream flow water rights on the Henrys Fork, Warm River, Bitch Creek, and Teton River, but the water rights are junior to the operation of Island Park Dam.
183	35	8-9	Again, see the DMP and reference here. You could also cite the presentation that Steve Trafton gave to the watershed council as part of BOR study in 2011.	Reworded: Reclamation cooperates with the Idaho Department of Fish and Game in conjunction with the Drought Management Plan to minimize these impacts.
184	35	3	Delete the word "basin" as this sentence is specific to fishery populations on the Henrys Fork River.	Deleted "basin"
185	35	13	The Henry's Fork Drought Management Plan has been an important tool that deserves direct and clear reference for the Needs Assessment. The DMP is part of the Fremont Madison Conveyance Act, which required FMID, Reclamation, and stakeholders (including TU, HFF, TNC, Harriman State Park and others) to meet 5 times per year to manage winter flows out of Island Park Dam. This has been a successful tool that has consistently provided water to improve the Henry's Fork fishery and met the needs of FMID/ Island Park storage right holders. The decisions are almost always made based on predicted inflows and weather reports and do not wait for the river to ice over before important decisions are made (as stated in line 18).	Comment was addressed in other places and the last sentence was deleted.
185	35	17	Cite DMP.	Done
187	35	19	Breaking up ice hasn't been part of the DMP process for the past 10 years, likely because flows are flexibly managed to be higher during the winter months that are typically the coldest.	Sentence deleted.

Comment No.	Page	Line	Comment	Response
188	35	21	The PFC reference to allowing the river to ice over for swan management hasn't been utilized since the formation of the Drought Management Plan, and swan advocates have used other methods to move swans in the last 10 years.	See above.
189	35	27,28	In the ESPAM modeling parlance the term "tributary underflow" has been used to refer to water that enters the aquifer laterally in the subsurface. If that is how the term is used here, it is probably not appropriate to attribute it to "irrigation activity within the Henrys Fork Basin." There are two reasons for this: 1) Most of the recharge from irrigation in the Teton region discharges to the Teton rather than the ESPA; 2) Most of the irrigation from the Henrys Fork and lower Teton produces recharge that percolates vertically into the ESPA rather than laterally from outside the aquifer. It is true that a large part of the lateral underflow to the aquifer occurs in the Ashton region but this is predominantly natural underflow from the Island Park basalt aquifer and does not originate from irrigation.	Changed "tributary underflow" to "recharge"
190	35	12	Water use of the hatchery is nonconsumptive and returns to the system after flowing through the hatchery	ADD the Following Sentence. Water use of the hatchery is nonconsumptive and returns to the system after flowing through the hatchery
191	35	Table 12	fails to suggest any need for fish and wildlife with regards to water. It only mentions that estimates vary. I suggest adding that in general, more water in streams is better than less water.	Comment Noted- Reclamation has discussed this a lot and realizes the limitation of this statement. However it is a reflection of the lack of knowledge related to a specific quantity being generally accepted.

Comment No.	Page	Line	Comment	Response
192	36		Table 12. Where did the 1,417,320 acre-feet estimate of agricultural use come from, and why is it included? If these are just the agricultural areas that are non-irrigated or otherwise are sustained by deep groundwater, soil moisture, and precipitation, then the water use on those areas is not really related to any part of the water storage, withdrawal and delivery system. In other words, it is "incidental use" of water that would be used on those lands regardless of whether they are covered with natural vegetation or some land cover used for agricultural purposes (hay or pasture or even grazing on native vegetation in upland areas). Those are areas that just transpire what is available, so this doesn't count as "water use." We have calculated that actual crop ET use by crops in the irrigated areas of the watershed is about 312,000 acre-feet. How does this number get inflated to 1,417,320 acre-feet? On what lands is the other 1.1 million acre-feet used, and what is the source of that water? I strongly recommend replacing this figure with something more meaningful, or at the very least, explaining where the 1.4 million acre-feet came from. If it came from my work, I would especially like to know what figures were used to obtain it. One of the pieces of information I have worked hard to convey to the stakeholders over the past two years is that consumptive use is limited by ET, which is ultimately a function of our climate. At the very maximum, land cover of any type (and even open water) in the Henry's Fork watershed has an ET of 30 inches. In most places, it is much less, and if you averaged over the whole watershed, including high-elevation areas, it is more like 18 inches. But anyway, say it is 2 feet, for an average over all areas that can support agricultural production of some sort (including non-irrigated pasture). The 1.4 million acre-feet of use you quote is equivalent to 700,000 acres, assuming 2 feet of use. Do you have figures indicating the 700,000 acres of the watershed are used for agriculture? Using IDWR's database, we found that there are about 450,000 acres across the whole watershed on which there is some sort of irrigation water right (you can cite Lora Liegel's master's thesis for this figure; the online link is: http://humboldt-dspace.calstate.edu/xmlui/handle/2148/717). This is the maximum acreage that can be legally irrigated, so this accounts for only 900,000 acre-feet of use, even if every acre that could be legally irrigated is irrigated with 2 feet of water each year. Where do the other 500,000 acre-feet come from? It must be from land that is not irrigated, in which case the use on that land shouldn't count toward "use," because ET just equals precipitation on these lands, and that is no different than what would happen on these lands if they were managed under their natural vegetative state. I have used the terms "deep groundwater" and "nonirrigated ET" in my water budget to indicate water that cannot be accounted to any of the fates in the water budget. This is the difference between the total watershed precipitation and the amount we can account for in the surface and shallow groundwater system (please add this last category, in accordance with my latest water budget version). This difference is roughly 2 million acre-feet. This is water that either percolates deep into groundwater or that is used by ET before it can get into either the surface or groundwater system. Certainly some of that is consumed by non-irrigated agricultural land, but again, that use is no different than what would occur under natural vegetation, because ET rates cannot exceed precipitation in non-irrigated areas, regardless of whether they are used for agricultural purposes or not. As an example, consider areas on the Targhee National Forest in Island Park on which cattle are grazed seasonally. These lands are use for agriculture, but the vegetative cover on them does not consume any more water than it would if it were grazed by wildlife or not grazed at all.	1,417,320 ac-ft is documented on page 25 and is the amount estimated to be diverted for irrigation in the Henrys Fork Basin. Change Table 12 water uses to Agriculture (water diverted) Other comments – Noted
193	36	3	add in "Egin Bench" to describe the canals	Done
194	36	4	"water passively infiltrates into the ESPA" This statement should be qualified because the proportion of the water from the Egin Bench canals that goes into ESPA is still unknown.	Changed to "In both situations, water passively infiltrates into the ESPA; however, the proportion of water from the Egin Bench canals that goes into the ESPA is still unknown."

Comment No.	Page	Line	Comment	Response
195	36	5	see prior comment on FMID recharge relative to other recharge to ESPA and the amounts (acre-feet and dollars).	See previous comment
196	36	7	The volume of water recharged by FMID in 2009 should be 37,317 af rather than 36,755 af.	Changed to 37,317
197	36	Table 12	The parenthetical behind Agriculture in the table is confusing.	Eliminated the parenthetical comment
198	36	Table 12	Elaborate on the estimated current water use in the Henrys Fork Watershed for Environmental Uses – "various recommendations" is not sufficient.	See response to IDFG comments above.
199	36	Table 14	The first two lines appear to describe current uses and the last line appears to describe "recommendations." This seems inconsistent.	Table 12 is current use only.
200	36	5, Table 11	Reconcile lines 21 and 22 of page 20 with these values.	Done with Cynthia's comment.
201	37	7	Note all hydroelectric, not just Island Park?	Deleted "Island Park"
202	37	20	The needs assessment notes that "additional calibrations would need to be made and climate change projections reevaluated for results specific to the watershed" without reference to whether this information will be provided in the Basin Study as WaterSmart guidelines spell out. With acknowledgement that this model isn't HF specific, when will we see specific climate change models?	From Toni Turner, Regional Office Climate Change Technical Lead: If the higher levels of analyses are authorized or additional funding is made available to update the model in the specific area of interest, this may be done.
203	37	30	Add information regarding the timing of these changes. In other words, WHEN will it be wetter and warmer?	From Toni Turner: Climate change (temperature, precipitation) is an average of weather that occurs over a period of time (usually 30 years is the minimum average used). As indicated in the paragraph referenced, the range of change in temperature and precipitation is anticipated to increase through the 21st century. Each year we may experience wetter conditions than historically experienced, drier, or warmer, etc., but the exact timing of those conditions is not known. There has been some success in verifying GCM predictions of temperature changes, but future timing cannot be stated without uncertainties.
204	37-38		Bob Gresswell, of USGS out of Bozeman, is a well recognized scientist in this area and specializes in fisheries research. He recently published a paper outlining the impacts which may result to Yellowstone cutthroat trout as a result of climate change. It may be worthwhile including that information here. I have attached the paper to the e-mail containing these comments.	The referenced paper was added to our literature review.
205	37		Future water needs starting on page 37: provides a substantial list of wants – I don't know that they are actual needs. The suggestion that increased hydropower out of Island Park Dam (very specific request) suggests that one option may be rising to the top of their list… Future water needs, page 38, second paragraph – they state that meeting water needs for fish and wildlife might be tough in the future, but earlier in the document didn't state what those needs were. They merely said the needs vary depending on who you talk to. How can they estimate how difficult it will be to meet the needs if they don't state what they are? And why are they willing to make that statement and move on, provided that meeting that need is one of the objectives they state is necessary and desirable for future storage consideration?	Comment noted. There is no mention of future storage in the needs assessment. The needs assessment is a snap shot of today's knowledge. Alternative planning will acknowledge the limitations of this needs assessment. The needs vs wants issue will be considered during the alternative planning process, particularly as it relates to ability to pay when moving forward with an alternative.

Comment No.	Page	Line	Comment	Response
206	38	28-33	It would be very worthwhile to further discuss the “management strategies that are used during drought periods, particularly in regions like Freemont and Teton where there are already water shortages, to minimize the economic consequences of agricultural water shortages”. Some of these management strategies are listed, but how much acreage is affected in the various irrigated regions? What is the economic impact of these strategies? If the deficit during drought years in these irrigated regions is part of the rational for the current basin study and looking at new alternatives to meet these needs, then the current strategies being utilized deserves a thorough review and explanation.	Comment noted. It is likely demand reduction strategies will be reviewed during the appraisal level planning process.
207	38	7-9	Reword this sentence as follows: “A decrease in instream flow in the late summer to early fall months would result in less water available for natural flow diversions. Water users and water managers must work to generate water supply solutions to provide adequate water supply in light of changing conditions.” The need assessment should NOT make assumptions about the best way to address the identified needs. Storage water is not necessarily the answer.	Deleted “and an increased need for stored water”
208	38	10	The assessment addresses changes in agricultural needs and the shift in reservoir drawdowns, but does not adequately address the impacts of climate change on fisheries. With the large-scale modeling that has been completed to date, there is no mention of the effects to headwater systems, all of which are above the mentioned storage facilities. Dan Isaak at the Rocky Mountain Research Station in Boise is an expert in climate change modeling and the effects to aquatic ecosystems. (http://www.fs.fed.us/rm/boise/AWAE/projects/stream_temp/stream_temperature_climate_aquatics_blog.html). If we are assessing water needs with a changing climate in relation to storage water, we need to acknowledge the influence this will have on headwater systems (and therefore the changing environmental needs) as well. This blog is a good place to start.	Info sent to Toni Turner for comment. Info received from Toni Turner In March 2009, Congress enacted the SECURE Water Act (SECURE) authorizing Reclamation to analyze the impacts of water supply changes (surface water, groundwater, and snowmelt) on eight major components that include: 1. Water delivery 2. Hydropower 3. Flood management 4. Recreation at Reclamation facilities 5. *Fish and wildlife habitat* 6. *Species listed as threatened, endangered, or candidate in the Endangered Species Act* 7. *Flow and water dependent ecological resiliency* 8. *Water quality (including salinity if it affects fisheries)* To analyze these impacts the Basin Study Program was initiated to include a reconnaissance level Impacts Assessment, the appraisal level Basin Study, and the feasibility scale SECURE Feasibility Study. All three of these studies will incorporate impacts to fisheries, specifically last four components in the above list, at differing scales of analysis. Reclamation is currently developing guidance to regions across the West to complete these studies and address all eight of the components in a consistent, west-wide approach.
209	38	25	Add in “annual” for unmet needs	Done.

Comment No.	Page	Line	Comment	Response
210	38	26	108,221 should be 24,890	Change 108,221 to 24,890
211	38	28	It's stated that: "….shortages 27 vary from 20 to 80 percent for individual canal companies." Referring to irrigated regions and not individual canal companies (see Table 8)?	This statement is from the 1991 reappraisal study and correctly refers to canal companies.
212	38		Agricultural water needs section (p 38) – they state that there is unmet need of 80,000 af, and that the teton exchange wells are located too far downstream to be useful. However, earlier in the document they indicated that these wells were used to replace water that originated in IP reservoir that was diverted. Therefore, these wells can provide a useful solution to the problem presented if water rights are re-allocated. Unmet demand estimates – since this has not been measured, it's difficult to lend credence to the estimates provided. Assumptions of need based on this analysis should be viewed skeptically. The last paragraph on page 38 indicates that "need" is addressed by rotational fallow, crop selection, and other ag practices that reduce the water need. This common ag practice occurs each year, not just in drought years and as such reduces the estimated need referred to throughout this document.	The Teton Exchange wells are located at the lower end of the basin; consequently, supplemental water from the wells ~~is not available in~~ can not be directly delivered to the areas with the greatest unmet irrigation demand. However, the Teton Exchange wells may be used to replace water that originated in Island Park reservoir. Table 8 applies standard procedure for estimating water shortages based on acres with irrigation rights. Page 30 lines 16 through 20 explain the limitations to these calculations. These estimates do not preclude the idea that selected irrigation practices may be the most economical/practical in meeting this estimate need.
213	39	11-13	Again, this needs to be reworded so as to refrain from drawing assumptions about the best way to address the identified need. Reword this sentence as follows: "The decrease in storage and instream flows in the late summer to early fall months could result in less water available for natural flow diversions. Water users and water managers must work to generate water supply solutions to provide adequate water supply in light of changing conditions. "	Deleted "and increase the need for stored water"
214	39	1	"...no increase in the current irrigation patterns" appears contradictory to Table 14 on page 47.	Changed to "no increase in the number of irrigated acres"
215	39	14	Change "impacted" to "decreased"	Line 17 explains it's not known if it will increase or decrease
216	39	17	Add an "s" to impact.	Done
217	39	7 & 11	"instream" should be "natural"	Concur. Change made
218	39	20	"The Basin Study area has the potential for further hydropower development in the future; however, Congress has banned new hydropower dams and diversions upstream of the town of Ashton (HFF 2012b)". HFF website should not be cited for this information, rather cite the original sources such as the Northwest Power Planning Council and the Comprehensive State Water Plan: Henrys Fork Basin.	Reworded and re-cited: "The Basin Study area has the potential for further hydropower development in the future; however, the State Water Plan provides for the subordination of hydropower water supplies to assure an adequate water supply for future upstream beneficial uses (IWRB 2012c)." from State Water Plan
219	39	22	Is the banning of diversion and dams upstream of the town of Ashton a confirmed statement? If this is so, this should have been public information prior to the decision to study Moose Creek.	See above

Comment No.	Page	Line	Comment	Response
220	39		The paragraph on the top of page 39 suggests that because of the increased growing season resulting from climate change, more water will be needed to grow crops. The assumption is made that additional water rights will be issued so everyone can divert as much water as needed. This is a bad assumption and should be discounted. We cannot base future models of water need on increasing water rights. It would be more proper to assume that we need to tailor these estimates on the water rights that exist now, as opposed to assuming there will be more rights for everyone in the future. If we are truly facing a shortage, how can more rights be issued?	Comment Note: The paragraph in question states what would happen to the need for irrigation water, and may happen to instream flows/diversion if this need is met. No assumption of reservoir operation is made.
221	40	15-18	I believe that this is Teton Valley specific. Reword as follows: "During water shortages some irrigators, such as those in Teton Valley, may purchase additional water from Island Park Reservoir to provide water in the Henrys Fork River and Teton River (delivered through the Cross-Cut Canal) to meet senior downstream water rights. However, this out-of-basin water exchange leads to lower flows in the tributaries which impact fisheries in headwater tributaries."	Done mostly—left out last 3 words.
222	40	4	Add agriculture at the end of the sentence?	This section is about M&I water. While this criteria may be appropriate for other uses, it is a paramount concern, as presented by the cities, that they are limited in growth due to their inability to obtain ground water rights.
223	40	4	add agriculture at the end of the sentence?	See above
224	40	17	Specifically refereeing to Teton Valley tributaries?	See above
225	40	18	Sentence should be reworded: "There are ten stream reaches of concern listed in which current flow alterations are potentially impacting fisheries." There are 10 stream reaches (the tributaries are labeled 7a-d), but are individual reaches), not seven and these are streams that are currently affected.	Changed to "seven sets of streams reaches" as per VK's 2011 article
226	40	18	Sentence should be reworded: "There are ten stream reaches of concern listed in which current flow alterations are potentially impacting fisheries." There are ten stream reaches (tributaries are labeled 7a-d, but are individual reaches), not seven and these are streams that are currently affected.	Done

Comment No.	Page	Line	Comment	Response
227	40-45		Ecological Needs Assessment page 40-45: IDFG asks for a final review of this section before the final document comes out. The paragraph on the bottom of page 40 dealing with minimum flows in the Henrys Fork is difficult to understand. How does purchasing water from Island Park Dam result in lower flows in tributaries? This needs clarification. The author then goes on to state that 7 reaches of streams were identified as areas of concern where stream alterations might impact fish resources. This is absolutely inaccurate and of great concern. Flow alterations are of concern EVERY PLACE THEY OCCUR and have the ability to impact fish resources in all locations. This information was requested by BOR to identify specific locations where increased flows might benefit a resource and should NOT be boiled down and interpreted that these are the only locations where flow alterations are a concern. It would be more accurate to re draw that table to reflect that ALL stream reaches are a concern, and that minimum flows and a natural hydrograph are the primary needs. This section is very alarming and an example of how a simple data request is being incorrectly interpreted.	Refer to "Ecological Streamflow Needs in the Henry's Fork Watershed" September 7, 2011 (VanKirk, Rupp, De Rito) as this paper was in large part the source of this information provided in the needs assessment. Replace the paragraph at the botton of page 40 with the direct statement made in the referenced document, which is "current water management practices allow Teton Valley irrigators to purchase water from storage facilities out of the basin (most commonly out of Island Park Reservoir) to provide water for downstream senior users when the State curtails surface water usage. This practice, resulting in out-of-basin water exchanges, tends to exacerbate tributary dewatering issues." Add after 1st sentence on page 41. While Table 13 presents a list of stream reach of concern, as documented in "Ecological Streamflow Needs in the Henry's Fork Watershed" September 7, 2011 (VanKirk, Rupp, De Rito), flow alterations are of concern every place they occur, throughout the Henrys Fork Basin, and have the ability to impact fish resources in all locations.
228	41	4	It's inaccurate to state that irrigation mitigates itself through recharge. Delete last sentence and replace with: "While groundwater recharge from irrigation activities helps replenish downstream flows, diversions often entrain fish and leave critical fish habitat dry."	ADD – after last sentence. While groundwater recharge from irrigation activities helps replenish downstream flows, diversions often have a negative impact on fish and fish habitat.
229	41	6	The Teton Valley Tributaries and Small Streams sections recommending "management alternatives must be based on site specific information" would be true for all of the alternatives, but the statement doesn't address the stream flow needs. Replace "management alternatives must be" with "Needs are…" or insert more information available on specific stream reaches to give a more sufficient overview of streamflow needs based on information provided by Van Kirk et al.	Comment – this statement is made based on all the information provided in the document Ecological Streamflow Needs in the Henry's Fork Watershed" September 7, 2011 (VanKirk, Rupp, De Rito). Reclamation does not have specific information on the exact in stream flow needs for these small stream segments. The statement "management alternatives must be …" reflects that the specifics needs are not known thus documenting this limitation.
230	41	Table 13	List all streams that are mapped and add map numbers to table to match Figure 14.	Figure 14 locations noted on Table 13

Comment No.	Page	Line	Comment	Response
231	41	Table 13	For Teton Valley Tributaries, it is appropriate to state that the Primary Stream Flow Need is “Increase mid and late summer flows.”	Change as requested.
232	41	Table 13	List all streams that are mapped and add map numbers to table to match Figure 14.	Figure 14 locations noted on Table 13
233	45	1-2	Reword sentence: “The timing and magnitude of peak and seasonal flows in the Henrys Fork River Basin are important to sustain its fisheries. The current alteration of flows below storage and power facilities on rivers in the basin are mitigated to some extent by inflows….”	Added “rivers in the basin are”
234	45	7-8	Climate-induced changes in the hydrologic regime of the Henrys Fork basin could impact early life stages of spring-spawning trout, i.e., Yellowstone cutthroat trout and rainbow trout.”	Done
235	45	5-6	Specify which tributary basins, and at what scale (Teton River or Fall River as a tributary basin, or small like Moose Creek).	Comment – this is the extent of existing information. Refer to the referenced document for context.
236	45	2	Reword sentence: “The current alteration of flows below storage and power facilities on rivers in the basin are mitigated to some extent by inflows…….”	Added “to some extent”
237	45	3	Similar to page 41, line 4, the statement that the alteration of flows below storage and power facilities is mitigated by inflows. Perhaps “Groundwater recharge and inflows from tributaries increase the altered flows below storage and power facilities.”	Address in previous comment.
238	45	8	add....."spring-spawning trout, i.e., Yellowstone cutthroat trout and rainbow trout"	Done
239	45	8	Add “Climate change models also show many streams throughout Idaho drying up or losing connectivity with larger streams and rivers, posing a threat to many stages of life cycles for fish.”	Does not agree with our climate change modeling results.
240	45	17	Add “Since the completion of the ESPA CAMP in 2009, the groundwater districts have purchased three trout production facilities, reducing the springflow demand by 400,905 acre-feet per year. In addition to the demand reduction, thousands of acres that traditionally used groundwater have converted to surface water for irrigation (Tominaga 2012).” (The GW – SW acreage needs to be confirmed with Tominaga or IDWR).	The purchase of three trout production facilities has not reduced springflow demand. Rather it has reduced the possibility of an “irrigation call”, since the groundwater users now own the trout production facilities.
241	45	21	Add in "of storage water" Island Park Reservoir. There are no diversions, or very few, directly from Island Park Reservoir.	Done
242	45	31	“Declining aquifer levels and spring discharges..”(qualify that these are “discharges to Snake River springs, e.g., Thousand Springs area”?)	Done

Comment No.	Page	Line	Comment	Response
243	45		Page 45, top paragraph states that flow alterations from dam operation are mitigated by tributary flows. You cannot make that statement and then cut flows below Island Park Dam to 80 cfs and say the impacts have been mitigated! Next paragraph states that climate change might affect the timing of spawning and emergence. I suspect that dam operations WILL affect fish populations much more than climate change will over the next 100 years, especially in the Upper Henrys Basin. Next paragraph page 45 line 10– the authors were able to dig up old information on swan management and winter flows, but totally ignored the 10 years of data on fish that state winter flows are important for overwinter survival, and is the number one factor affecting year class strength and trout populations. Interesting omission.	Change -- The current alteration of flows below storage and power facilities on the river is *partially* mitigated by inflows from the tributaries and groundwater recharge from irrigation activities. Increased winter flows, below Island Park Dam, are defined as a primary stream flow need (Table 13). Winter flows are important for overwinter survival, and is the number one factor affecting year class strength and trout populations (IDFG). Comment noted – dams operations likely will have a greater impact on fish population than climate change. However, this general statement is accurate. Line – 10 – see change above.
244	46	8 & 11-17	What is the current or recalculated unmet need in the ESPA with the purchase of the fish hatchery facilities in the Thousand Springs area? See presentation on March 13, 2012 by Lynn Tominaga, Idaho Groundwater Users Association. Additionally, what is the current or recalculated short term targets, given the amount of recharge which has been conducted and other measures which have been implemented?	Answered in another comment
245	46	8	What is the current or recalculated unmet need in the ESPA with the purchase of the fish hatchery facilities in the Thousand Springs area? See presentation on March 13, 2012 by Lynn Tominaga, Idaho Groundwater Users Association.	See above
246	47	1	Table 14 needs to be adjusted to reflect the major strides that the state and irrigators have made to reduce the overall demand on the ESPA. There also needs to be more concrete data in the table to reflect the needs of environmental needs, and an explanation of the 200,000af figure for fisheries, along with a description of the difference between environmental (which would be better termed as ecological) and fisheries needs.	The 600,000 acre feet is documented State Policy. Reclamation has asked the State for an update of this number's current status. Change: Add a footnote to the 600,000 ac-ft. ESPA goal (circa. 2009). The State of Idaho has met a portion of this goal the past three years. Change environmental needs to ecological needs (check if this occurs elsewhere in the document) Change: Add a footnote to the 200,000 af figure, reference this data to figure 13. Change; Add Line 6 page 40 "Fishery needs are a primary ecological need within the Henrys Fork Basin."

Comment No.	Page	Line	Comment	Response
247	47	Table 14	Table is inconsistent, mixes depletion needs with instream needs, must be made clear consumptive needs can only be satisfied if enough water is provided to actually deliver the consumptive crop requirements. Recommend table be revised to show diversion requirements for agriculture rather than just depletion amount.	Added a footnote “Agricultural Current and Future Use refers to crop consumptive requirements. To meet these crop requirements, additional water must be diverted to account for canal and on-farm inefficiencies.”
248	47	Table 14	The increased needs for agriculture appear to contradict page 39 line 1.	P. 39 Changed to “no increase in the number of irrigated acres”
249	47	Table 14	1: Environmental needs must be specified with more accuracy, “Various Recommendations” is not sufficient. 2: Additionally, please specific where the 200,000 acre-feet need for fisheries is coming from.	Regarding “various recommendations” Comment Noted- Reclamation has discussed this a lot and realizes the limitation of this statement. However it is a reflection of the lack of knowledge related to a specific quantity being generally accepted. Regarding “200,00 ac-ft” Changed: Add a footnote to the 200,000 af figure, reference this data to figure 13.
250	47	Table 14	Figure 14 on page 47 is horribly misleading. The depicted reaches are not the only reaches of concern – they are the reaches identified as being able to benefit from increased flows. If we are making a map of the areas of concern, every stream in the study area needs to be included! This is a horrible injustice to the data the partners provided to this process. Table 14 on page 47 – future water needs – Shows fisheries as not having any needs now. I’d argue that we already have an unmet need based on figure 13 which shows we are already below the recommended flows needed for fisheries health by 200,000 AF. As future water demands increase and more and more water is diverted, I would suspect our unmet need will increase above and beyond where it is now. In fact, I would argue that every AF diverted is one taken away from fish and wildlife. So for every increase in diverted water, you could argue an equal increase in unmet fish and wildlife need.	Regarding Table 14. The 200,000 ac-ft should be shown as a current unmet need. For Project Future Use and Future Unmet Needs enter “To be determined”.
251	General		In summary, this document makes large inferences in the theoretical need vs the actual need for increased storage. To date, local irrigators, water masters and canal operators have not shown an unmet irrigational need in most years. For this document to be relevant, specific measurable analysis should be completed that shows specifically (by canal) where the demonstrated need is. Further, assumptions that additional water rights will be allocated should be removed from this document. It would be irresponsible for new water rights to be issued above and beyond where we currently are if there truly is an unmet demand for the current water rights. New storage will only further to exacerbate our limited resources with this type of mentality.	Comment noted. No assumption that additional water rights will be allocated is contained in this document. The analysis of in-basin agricultural needs is based on established procedures using flow and land use data provided by Dr. Van Kirk. No mention of new storage is made in this document.

Comment No.	Page	Line	Comment	Response
252			I don't believe that we should construct any more dams in the Henrys Fork Basin. And I don't think that the draft Needs Assessment makes the case for more water storage. Table 10 lists estimated "Future +Unmet Water Needs" for the next 40 years. The discussion of the Eastern State Plain Aquifer (ESPA) says that there is an estimated Future Unmet Water Need of 600,000 A-ft related to the aquifer, but the connection with possible new water storage sites in the Henrys Fork Basin is unclear. There is a Future Unmet Water Need for Agriculture of an estimated 171 thousand A-ft, which would be about 12% of current Agricultural water use. This would appear to be a "wish" for more water rather than a real need. One has to ask how the irrigators have been able to grow crops for the past several decades. Of course some irrigators would like more water, but at what price? There is also the complicating factor of senior downstream water rights. It seems that in dry years, even if any new reservoirs filled, the water would be called for by downstream water right holders, and thus not available in the Henrys Fork Basin. While not a large amount compared to Agricultural water use, there is an estimated Future Unmet Water Need for domestic, commercial, municipal, & industrial uses of 18 thousand A-ft, which is the same as the current use and would double projected future use. Given the explosive growth in the Basin over the past 40 years (Figure 10), particularly in Teton and Madison Counties, not supplying more water would probably be a good thing; it might help dampen future growth An Unmet Need for fish, wildlife, and other environmental reasons is indicated but not estimated. However, one can not usually justify destroying aquatic and riparian ecosystems in one area, which is what a dam would do, in the hopes of improving ecosystems in another area. There are plenty of places around the world where people are suffering from lack of water; other places from polluted water. Eastern Idaho is hardly one of these places. Those asking for more water storage are probably advocating more dams to store it. But considering the numerous existing dams on the Snake River and its tributaries, many people feel that we have enough dams, and that the real "need" is to protect remaining undammed reaches of our precious streams.	Note: Jerry Jayne's comments are from the 1st draft and not from the Draft posted on the website. As such several of the comments have been addressed. There is no mention of dams in the needs assessment. Related to future unmet water need for agriculture… Table 8 applies standard procedure for estimating water shortages based on acres with irrigation rights. Page 30 lines 16 through 20 explain the limitations to these calculations. Regarding future unmet water need for municipal and industrial use… comment noted. Regarding destroying aquatic and riparian ecosystems .. there is no mention of dams in the needs assessment. There is no mention in the document of any one asking for more water storage.