Technical Appendix 7

Fish and Wildlife Coordination Act Report
and
Planning Aid Memoranda

Fish and Wildlife Coordination Act Report

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
755 Parfet Street, Suite 361
Lakewood, Colorado 80215

IN REPLY REFER TO:
ES/CO:BR-ALP
MS 65412 GJ

June 12, 2000

Memorandum

To: Regional Director, Upper Colorado Region, Bureau of Reclamation, Salt Lake City, Utah

From: Colorado Field Supervisor, U.S. Fish and Wildlife Service, Ecological Services, Lakewood, Colorado

Subject: Fish and Wildlife Coordination Act Report for the Animas-La Plata Project, Colorado and New Mexico

Attached is our Fish and Wildlife Coordination Act Report for the Animas-La Plata Project. This report presents the Fish and Wildlife Service analyses of anticipated impacts to fish and wildlife resources in Colorado and New Mexico resulting from development and operation of the full Project described in the Preliminary Final Supplemental Environmental Impact Statement to the 1996 Final Supplement to the Final Environmental Statement. It was prepared cooperatively with the Colorado Division of Wildlife and New Mexico Department of Game and Fish pursuant to the Fish and Wildlife Coordination Act. Both State agencies have formally concurred with the analyses and recommendations presented in the report (concurrence letters attached to the Report).

The Animas-La Plata Project is located in southwestern Colorado in La Plata and Montezuma Counties, and northwestern New Mexico in San Juan County. The project will affect the Animas and San Juan Rivers of the Colorado River Basin. This report reflects changes to the project since the previous report issued in January 1993. An updated report was deemed appropriate due to the nature and extent of the changes to the project since 1993. The Report provides the U.S. Bureau of Reclamation with an evaluation of anticipated impacts caused by the project, as well as recommendations for mitigating impacts to; terrestrial and aquatic wildlife, water quality, and riparian wetlands associated with the agency preferred alternative of the Final Supplemental Environmental Impact Statement to the 1996 FSFES.

The purpose of the ALP is the implementation of a portion of the Colorado Ute Indian Water Rights Settlement Act of 1988 (Public Law 100-585), to provide the Ute Tribes an assured long-term water supply and water acquisition fund in order to satisfy the Tribe's senior water rights claim, and to provide for identified municipal and industrial water needs in the project area. The project is designed to deplete no more than an average annual amount of 57,100 acre-feet of water from the San Juan River, as specified in the January 4, 1999, Notice of Intent to prepare a DSEIS to the 1996 FSFES.

The action agency is the Bureau of Reclamation. The ALP was authorized by the Colorado River Basin Act of September 30, 1968 (Public Law 90-537), as a participating project under the Colorado River Storage Project Act of April 11, 1956 (Public Law 84-485), which permits beneficial uses of part of the stream flows allocated to the States of Colorado and New Mexico

by the Colorado River Compact of 1922 and the Upper Colorado River Basin Compact of 1948. The authorization was based on the feasibility report of the Secretary of Interior transmitted to the U.S. Congress on May 4, 1966.

Additionally, in the 1996 Energy and Water Appropriations Act, the U.S. Congress included the following language.

> *"In order to ensure the timely implementation of the Colorado Ute Indian Water Rights Settlement Act of 1988, the Secretary of the Interior is directed to proceed without delay with the construction of those facilities in conformance with the final biological opinion for the Animas-La Plata Project, Colorado and New Mexico, dated October 25, 1991."*

The basis for funding and construction of the ALP is a cost-sharing agreement. On August 15, 1985, the U.S. Congress enacted Public Law 99-88, which appropriated $1 million for design and construction of the ALP, as described in the Definite Plan Report of 1979. Use of the funds was contingent upon completion of a binding Cost-Sharing Agreement. A Cost-Sharing Agreement was signed by Federal and non-Federal entities on June 30, 1986. That agreement divided construction costs of the initial two-phase project, as described in the 1996 FSFES. The Cost-Sharing Agreement is the basis for construction of the present project. The Agreement also established the Tribal Development Fund of $40 million to fully satisfy the water right not included in the depletion amount developed under the ALP.

The Service has previously issued a Fish and Wildlife Coordination Act Report for the Animas-La Plata project in January 1993. That report evaluated and recommended mitigation for the project as proposed at that time. That report was followed by other Planning Aid Memoranda, which reflected changes to the project and recommendations that were not covered in the 1993 Report.

Since the 1993 Report was issued, there have been changes to the project. The previous project description included 2 phases of the project. Phase I of the project included stages A and B. The principal difference between the current project and the project discussed in the 1993 Report is the lack of an irrigation component. The irrigation component has been de-authorized for the current project. The current project includes municipal and industrial water for current and future demand within the project area. Conveyance of water will primarily be directed down Basin Creek to deliver water from Ridges Basin Reservoir. Although the current project description includes non-binding water use scenarios in the La Plata and Mancos River drainages, the uses are for M&I development only. Essentially, phase I, stage B and phase II of the 1996 project have been removed from the current project. Previous Project components included the Southern Ute Diversion Dam, and Dry Side Canal to convey water to the La Plata River, and the Southern Ute Diversion to convey water to the SUDD. The old project included an additional pumping facility within Ridges Basin to convey water to the La Plata River, and additional pumping facilities for use in irrigating project lands. At this time there is not a plan to include a pumping facility within Ridges Basin. However, proposed mitigation may include some method to convey water to the La Plata River.

Phase I of the project is the only remaining component of the original project, however the size of the reservoir has been substantially reduced to 120,000 acre-feet. The current reservoir capacity is 90,000 acre-feet for M&I demand, with an additional 30,000 acre-feet for the creation of a recreational fishery within Ridges Basin Reservoir. The pumping facility that will be used to convey water to Ridges Basin has been modified to fit project parameters. The current pumping capacity is limited to approximately 280 cfs. Full project description in the 1993 Report included a pumping rate of approximately 480 cfs.

The 1993 Report discusses project lands with regard to irrigation. As mentioned above, irrigation is no longer a project component and lands associated with that component are no longer considered project lands.

Habitat Evaluation Procedures were used in the 1993 Report to evaluate the value of habitats lost by the inundation of Ridges Basin. This method is an effective method with which to evaluate habitats, however current technological advances allowed for the application of more current methods. In the 1993 Report, mitigation for the inundation was directed toward replacement of elk winter range. This report uses GIS data developed by the CDOW to evaluate habitat impacted by inundation of the reservoir, and to evaluate mitigation lands to ensure adequate mitigation of impacts. Mitigation of upland and riparian-wetland habitats is no longer limited to elk, but rather to all species that use these habitats.

A mitigation plan for wetland impacts was proposed for the previous project that would create wetlands for mitigating impacts resulting from losses within Ridges Basin. The mitigation site was to be located within the Basin Creek Drainage below the Ridges Basin Dam. That plan has been abandoned, because the current project description will release water down Basin Creek as the primary delivery component of the Project. The volume of water released down Basin Creek will likely preclude pursuing mitigation within this drainage.

Based on response to our recommendations included in the Final Preliminary Draft SEIS 2000, the Service has determined the following wildlife resources may suffer unmitigated losses as a result of Project actions:

1. Native fish in the Animas River, without mitigation (completed in advance or concurrent with project impacts) that would result in no net loss of aquatic habitat.

2. Wildlife habitats, without operation and maintenance funding in perpetuity.

3. Animas River trout populations and recreational fishery, without monitoring, and appropriate mitigation of impacts that occur on non-reservation lands from the Durango Pumping Plant to the Southern Ute Indian Reservation (Gold Medal Fishery).

4. Golden eagle nests on Carbon Mountain if nests are "taken" and appropriate mitigation is not completed.

5. Riparian-wetland habitat along the Animas River corridor, without monitoring and completion of appropriate mitigation.

The Service recognizes that the Project is in a continuing state of evolution. Consequently, it is likely that additional FWCA documents will be necessary to amend or add to the Report as changes occur in Project design or operation, positions change, and new information becomes available. Because this document represents consensus opinions of the Service, CDOW, and NMDGF it should provide valuable assistance in Project planning, so that negative impacts to wildlife resources are minimized. The Service stands ready to continue its assistance to Reclamation in meeting this goal. We recommend this report be attached to the FSEIS and any interim drafts released for public review, to aid agency and public evaluation of wildlife issues.

Attachment

cc: BR, Grand Junction (Attn: Carol DeAngelis)
BR, Durango (Attn: Pat Schumacher)
EPA, Denver (Attn: Wes Wilson)
FWS/ES, Grand Junction
CDNR, Denver (Attn: Greg Walcher)
CDOW, Grand Junction (Attn: Mike Grode)
CDOW, Montrose (Attn: Norwin Smith)
CDOW, Durango (Attn: Chris Kloster)
NMDGF, Villagra Building, PO Box 25112, Santa Fe, NM 87504 (Attn: Nick Medlee)
Southern Ute Indian Tribe, PO Box 737, Ignacio, CO 81137
Ute Mountain Indian Tribe, General Delivery, Towaoc, CO 81334
The Navajo Nation, PO Box 9000, Window Rock, AZ 86515
Jicarilla Apache Indian Tribe, PO Box 507, Dulce, NM 87125-6567
Pioneer Corporation, 980 W., 1800 S., Logan, UT 84321 (Attn: Dennis Wenger)
SWCA, Inc. Environmental Consultants, 172 W. 1275 S., Logan, UT 84321 (Attn: Richard Valdez Ph.D.)
Argonaut Consulting, 7649 Sunrise Blvd., Suite E, Citrus Heights, CA 95610 (Attn: Andrea Grenier)

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FINAL
FISH AND WILDLIFE COORDINATION ACT REPORT
FOR THE ANIMAS-LA PLATA PROJECT
June 12, 2000

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ACKNOWLEDGMENTS

The Service would like to offer thanks to Richard Valdez Ph.D., SWCA, and Dennis Wenger, Pioneer Corporation, for their professional contribution in preparing this report. Both gentlemen used their professional expertise, experience, and patience in evaluating data, preparing sections of the report, and editing drafts of the document. Thanks also to Nic Medley, New Mexico Department of Game and Fish, and Norwin Smith of the Colorado Division of Wildlife for acting as points of contact for the preparer, providing essential information regarding species and habitats within their respective States, reviewing and providing comments to draft versions of the Report. Thanks to Kirk Lashmett, United States Bureau of Reclamation, for providing data, experience, and background information essential to preparation of the Report.

Special thanks to Laurie Bjornestad for her patience and expertise, in editing and preparing documents for distribution.

1.0 INTRODUCTION

1.1 NAME AND LOCATION OF THE PROJECT

The Animas-La Plata Project is located in southwestern Colorado in La Plata and Montezuma counties; and in northwestern New Mexico in San Juan County. The project will affect the Animas and San Juan Rivers of the Colorado River Basin. This report has been prepared by the U.S. Fish and Wildlife Service under the authority of, and in accordance with, the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401 as amended: 16 U.S.C. 661 et seq.). This report reflects changes to the project since the previous report issued in January 1993. An updated report was deemed appropriate due to the nature and extent of the changes to the project since 1993. This report provides the Bureau of Reclamation with an evaluation of impacts caused by the project, as well as recommendations for mitigating impacts to terrestrial and aquatic wildlife, water quality, and riparian-wetlands associated with the agency preferred alternative of the Draft Supplemental Environmental Impact Statement to the 1996 Final Supplement to the Final Environmental Statement.

1.2 PURPOSE OF THE PROJECT

The purpose of the ALP is the implementation of a portion of the Colorado Ute Indian Water Rights Settlement Act of 1988 (Public Law 100-585), to provide the Ute Tribes an assured long-term water supply and water acquisition fund in order to satisfy the Tribe's senior water rights claim, and to provide for identified municipal and industrial water needs in the project area. The project is designed to deplete no more than an average annual amount of 57,100 acre-feet of water from the San Juan Basin, as specified in the January 4, 1999, Notice of Intent to prepare a DSEIS to the 1996 FSFES.

1.3 ACTION AGENCY STUDY AUTHORITY

The action agency is the Bureau of Reclamation. The ALP was authorized by the Colorado River Basin Act of September 30, 1968 (Public Law 90-537), as a participating project under the Colorado River Storage Project Act of April 11, 1956 (Public Law 84-485), which permits beneficial uses of part of the stream flows allocated to the States of Colorado and New Mexico by the Colorado River Compact of 1922 and the Upper Colorado River Basin Compact of 1948. The authorization was based on the feasibility report of the Secretary of Interior transmitted to the U.S. Congress on May 4, 1966.

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1.4 LIMITATIONS, SCOPE, AND ASSUMPTIONS

The evaluations described in this report address the Agency Preferred Alternative, compared to a No Action Alternative, of the DSEIS to the 1996 FSFES for the ALP. This report will provide Reclamation with an evaluation of impacts, caused by the preferred agency alternative, to terrestrial and aquatic wildlife, water quality, and riparian-wetlands. The preferred agency alternative consists of structural components, non-structural components, and non-binding water use scenarios. This evaluation is limited to the structural components, described by Reclamation (Interagency Meeting, August 6, 1999), and addressed in the 1999 DSEIS. The non-structural components are not sufficiently described at this time for the Service to fully assess the impacts of those project features, and will not be addressed. Physical features of the non-binding scenarios will similarly not be addressed; however, the Service evaluated hydrology of the proposed project which includes the non-binding water use scenarios. Evaluation of full project hydrology was conducted in order for this document to be consistent with the 57,100 acre-feet of depletion proposed for this project. Assumptions of water use, and return flows by individual components of non-binding scenarios are described in the DSEIS. Hydrological information for the proposed project was provided by Reclamation. The Service and other cooperating agencies used this information to assess impacts to aquatic resources, and riparian-wetland habitats. When the non-structural components, and physical characteristics of the non-binding scenarios become firm proposals, they must be considered in future NEPA compliance, coordination under the Fish and Wildlife Coordination Act, and under the Endangered Species Act.

It is assumed that the structural components, as defined at the time of this report, are features of the final design of this project, for which Reclamation has made a firm commitment to construct and operate. Changes, additions, or variations from these features will need to be evaluated by the Service through additional Planning Aid Memoranda or amendments to this report.

Structural components of the ALP include: (1) Durango Pumping Plant, (2) Ridges Basin Inlet Conduit, (3) Ridges Basin Dam and Reservoir, and (4) Farmington to Shiprock Water Pipeline.

In addition to the four principal structural components, there are three additional structural features that will be necessary as a result of the inundation of Ridges Basin. These include: (1) relocation of 4 natural gas or petroleum byproduct pipelines from Ridges Basin, (2) relocation of County Road 211, and (3) relocation of electrical transmission lines that fall within the reservoir footprint. Also associated with the project are the potential development of recreational facilities in and around Ridges Basin Reservoir.

Non-structural components, include a $40 million water acquisition fund, which would be used to purchase additional water rights of 13,000 acre-feet of depletion from existing users to fully satisfy the total quantity of depletion recognized in the settlement agreement. Purchase of water rights would be made on a willing buyer/willing seller basis. To provide flexibility, some or all of the funds could be redirected for on-farm development, water delivery infrastructure, and other economic development activities, which are not defined at this time.

Descriptions of non-binding water use scenarios include methods of water delivery and water uses. A number of water delivery methods have been identified to convey water from Ridges Basin Reservoir; however, at this time there are no proposed actions that would require the use of conveyance other than Basin Creek.

1.5 RELATIONSHIP TO ACTION AGENCY STUDY DOCUMENTS

This Fish and Wildlife Coordination Act Report provides Reclamation with an evaluation and recommended mitigation of impacts of the preferred agency alternative for the ALP. Many aspects of the project were described and evaluated in the 1996 FSFES, and these evaluations are used when appropriate and referenced in this document. This report precedes the DSEIS, and utilizes the best scientific information available, which will also be used for the DSEIS document. Environmental impacts for a more expansive ALP were initially described in the 1980 Final Environmental Statement and the 1992 Draft Supplement. A Definite Plan Report, in September 1979, also described the larger project. Also, a section 404(b)(1) Evaluation Report was prepared in 1996 and is being revised for the DSEIS.

Technical evaluation reports for the current alternative have been developed by Reclamation for geology, soils, hydrology, water quality, aquatic resources, Wild and Scenic Rivers Act issues, wildlife habitat, endangered species, riparian-wetlands, cultural resources, recreation and tourism, socioeconomic issues, environmental justice, and Indian Trust Assets. Additionally, a 7-Year Research Study has been completed on the San Juan River and a Flow Recommendations Report (Holden 1999) has been issued, specifying water deliveries for endangered fishes in the San Juan River.

1.6 COOPERATING AGENCIES AND CONCURRENCE

This FWCA Report was developed by the Service in cooperation with the Colorado Division of Wildlife, New Mexico Department of Game and Fish, and the Southern Ute Indian Tribe. The

CDOW provided information and input on project impacts to fish and wildlife resources in and around the middle Animas River and Ridges Basin in Colorado, and the NMDGF provided information and evaluation for the lower Animas River and the San Juan River in New Mexico. Evaluation of impacts on the Animas River within the Southern Ute Indian Reservation was provided by the SUIT. Assimilation of information for the development of this report was also coordinated with Reclamation. Concurrence of this report has been given by NMDGF and the Colorado Department of Natural Resources. Letters of concurrence can be found in Appendix B.

1.7 PREVIOUS PROJECT REPORTS ISSUED BY THE SERVICE

The Service issued Planning Aid Memoranda on February 19, 1999, and July 15, 1999, for the proposed ALP. These PAMs specifically addressed alternatives for relocation of the natural gas pipelines, and alternatives for the project described in the Notice of Intent to prepare the DSEIS, respectively. The February 1999, PAM provided Reclamation with an evaluation of impacts to terrestrial and aquatic wildlife, water quality, and riparian wetlands associated with the proposed relocation of the pipelines. The July 1999, PAM provided Reclamation with an evaluation of impacts to terrestrial and aquatic wildlife, water quality, and riparian wetlands associated with 10 alternatives under consideration. The Service has previously issued a Fish and Wildlife Coordination Act Report for the Animas-La Plata project in January 1993. That report evaluated and recommended mitigation for the project as proposed at that time. That report was followed by other PAMs, which reflected changes to the project and recommendations that were not covered in the 1993 Report.

Since the 1993 Report was issued, there have been changes to the project. The previous project description included 2 phases of the project. Phase I of the project included stages A and B. The principal difference between the current project and the project discussed in the 1993 Report is the lack of an irrigation component. The irrigation component has been de-authorized for the current project. The current project includes Municipal & Industrial water for current and future demand within the project area. Conveyance of water will primarily be directed down Basin Creek to deliver water from Ridges Basin Reservoir. Although the current project description includes non-binding water use scenarios in the La Plata and Mancos River drainages, the uses are for M&I development only. Essentially, phase I, stage B and phase II of the 1996 project have been removed from the current project. Previous Project components included the Southern Ute Diversion Dam, and Dry Side Canal to convey water to the La Plata River, and the Southern Ute Diversion to convey water to the SUDD. The old project included an additional pumping facility within Ridges Basin to convey water to the La Plata River, and additional pumping facilities for use in irrigating project lands. At this time there is not a plan to include a pumping facility within Ridges Basin. However, proposed mitigation may include some method to convey water to the La Plata River.

Phase I of the project is the only remaining component of the original project; however, the size of the reservoir has been substantially reduced to 120,000 acre-feet. The current reservoir capacity is 90,000 acre-feet with an additional 30,000 acre-feet for the creation of a recreational

fishery within Ridges Basin Reservoir. The pumping facility that will be used to convey water to Ridges Basin has been modified to fit project parameters. The current pumping capacity is limited to approximately 280 cfs. Full project description in the 1993 Report included a pumping rate of approximately 480 cfs.

The 1993 Report discusses project lands with regard to irrigation. As mentioned above, irrigation is no longer a project component and lands associated with that component are no longer considered project lands.

Habitat Evaluation Procedures were used in the 1993 Report to evaluate the value of habitat lost by the inundation of Ridges Basin. This method is an effective method with which to evaluate habitat, however current technological advances allowed for the application of more current methods. In the 1993 Report, mitigation for the inundation was directed toward replacement of elk winter range. This report uses GIS data developed by the CDOW to evaluate habitat impacted by inundation of the reservoir, and to evaluate mitigation lands to ensure adequate mitigation of impacts.

A mitigation plan was proposed for the previous project that would create wetlands for mitigating impacts resulting from losses within Ridges Basin. The mitigation site was to be located within the Basin Creek Drainage below the Ridges Basin Dam. That plan has been abandoned, because the current project description will release water down Basin Creek as the primary delivery component of the Project. The volume of water released down Basin Creek will likely preclude pursuing mitigation within this drainage.

2.0 DESCRIPTION OF THE STUDY AREA

The study area is located along the Animas and San Juan Rivers in the States of Colorado and New Mexico in the southwestern United States. The Animas River is a tributary of the San Juan River, which flows into Lake Powell reservoir in the state of Utah. The reach of the Animas River potentially affected by the ALP extends from Durango, Colorado, for approximately 60 miles downstream to the confluence of the San Juan River near Farmington, New Mexico. The portion of the San Juan River likely to be affected by the ALP is downstream from the confluence with the Animas River to the inflow at Lake Powell.

This portion of the Colorado River Basin is characterized by high mountainous regions and arid mesas and plateaus. Average annual precipitation is over 40 inches per year in the mountains and 8-10 inches per year in the lower desert elevations. The majority of precipitation comes as winter snowfall and late summer monsoonal rainstorms.

Flow of the rivers is characterized by high spring floods from mountain snow-melt and low late-summer, fall, and winter flows. Periodic monsoonal rainstorms cause sudden, rapid, short-term increases in watershed run-off resulting in an irregular stream flow pattern.

The study area associated with the ALP spans from ponderosa pine and pinyon-juniper forests of high and moderate elevations to sagebrush flats and desert saltbush of low elevations. Extensive riparian areas of willow, cottonwood galleries, and introduced tamarisk line the affected streams, and much of the moderate and low elevation lands surrounding the streams, are under agricultural use for alfalfa, barely, wheat, oats, and truck crops.

3.0 DESCRIPTION OF THE PROJECT

3.1 THE PROPOSED ACTION

The agency preferred alternative includes both structural and non-structural components. There are four principal structural components: (1) Durango Pumping Plant, (2) Ridges Basin Inlet Conduit, (3) Ridges Basin Dam and Reservoir, and (4) Farmington to Shiprock Water Pipeline. In addition to the four principal structural components, there are three additional structural features that will be necessary as a result of the inundation of Ridges Basin. These include: (1) relocation of four natural gas or petroleum byproduct pipelines, (2) relocation of CR 211, and (3) relocation of electrical transmission lines that may fall within the reservoir footprint. Also associated with the project are the potential development of recreational facilities in and around Ridges Basin Reservoir.

3.1.1 Durango Pumping Plant

The Durango Pumping Plant would pump water from the Animas River and lift it through the Ridges Basin inlet conduit over the ridge above Bodo Creek into Ridges Basin Reservoir. The pumping plant would be located on the west side of the river across from Santa Rita Park, 1.6 miles downstream from the center of Durango, Colorado. Access to the pumping plant will be made from CR 211, immediately north of the Centennial Mall. Located on-site with the pumping plant would be the intake structure, a parking area, a surge chamber, and an electrical switchyard. The intake structure would conduct water from the river through control gates and to a fish screen, then into a covered basin that serves as a forebay for the pumping plant. The entrance to the intake structure would consist of a sloping grate, 48 feet long, situated to conform to the riverbank and designed to exclude the entry of debris into the control gates. The fish screen, 80 feet back from the river, would be designed to keep fish greater than 2 inches long from passing, and all fish would be channeled back to the river by the velocity in a bypass pipe at the base of the screen. The intake structure would be covered except for the fish screen area that would be open to facilitate cleaning and maintenance.

The pumping plant would be placed about 160 feet back from the river and would be both lower and not as long as the structure described in the 1996 FSFES. The lower flow requirement of 280 cubic feet per second facilitates the application of single stage horizontal centrifugal pumps instead of the higher-capacity vertical spiral case pumps previously proposed. The single stage horizontal pumps are similar in silt handling capability, are more accessible for maintenance, and

require less vertical space in the structure. Five pumps would provide a maximum of 280 cfs and four smaller pumps would handle lower flows, trim flows between the large pumps, and provide redundancy in case one of the large pumps went out of service. Oriented with the long side parallel of the river, the pump and equipment portion of the plant would be below the finished ground surface with an interior height of 43 feet, a width of 57 feet, and a length of 250 feet. Over this portion of the plant the crane housing would extend 24 feet above the ground to facilitate loading, unloading, and maintenance of the pumping units and equipment. The crane housing would be about 40 feet wide and 250 feet long. Construction would use cast-in-place and precast concrete. A spherical air chamber would be partially buried beside the parking area behind the plant and away from the river. Fill slopes between the plant and the intake structure and between the intake structure and the river would provide space to accommodate site landscaping.

Incoming power lines and an electrical switch yard would be located to the south of the pumping plant, between the plant and CR 211. The electrical transmission lines would be similar to those described on Page II-37 of the 1996 FSFES. "Western Area Power Administration would provide electrical power for the project either over existing transmission lines or by constructing a 14.5-mile, 115-kV line from the Hesperus Substation to the Durango Pumping Plant. If this new construction occurred, additional planning and adequate NEPA compliance would be conducted. Ridges Basin Pumping Plant would be served in a similar manner by a short, 0.5-mile tap line from this electrical corridor. To minimize impacts, new transmission lines would parallel existing lines, where possible."

3.1.2 Ridges Basin Inlet Conduit

The Ridges Basin inlet conduit route, from the Animas River up Bodo Draw to Ridges Basin, was selected because it provides the lowest pumping lift between the river and the active storage pool of the 120,000 acre-foot Ridges Basin Reservoir. It is also relatively close to the river and the terrain is not unusual for pipeline construction. The route of the conduit from the pumping plant to the reservoir is along the trace identified in the 1996 FSFES; it proceeds southerly from the pumping plant, turns southwest to cross CR 211 and the Bodo Creek flow line, continues to a point some 1,200 feet south of CR 211 then turns up Bodo Draw, south of the creek line, and crosses the crest along side CR 211. An air vent of about 12 inches diameter would stand about 8 feet above ground just before the crest of the ridge. Construction would include about 11,200 feet of 72-inch diameter steel pipe with a corrosion-protective coating and about 800 feet of improvements in the discharge course toward the reservoir. The conduit would be buried in a trench at a normal depth of 5 to 8 feet below the ground and backfilled, so that upon completion of construction the terrain would be recontoured to approximate pre-existing conditions. To conserve pumping lift, the costs of various depths of additional excavation, across the crest at the top of the draw, including tunneling, were compared with the savings in future power costs. It was found most economical to excavate up to 35 feet deep at the crest and maintain a maximum flow line elevation of 6,950 feet. The conduit would terminate on the reservoir side of the crest

with a stilling structure from which flow would continue down to the reservoir in a rock-lined ditch.

3.1.3 Ridges Basin Dam and Reservoir

Ridges Basin Reservoir, would be formed following construction of Ridges Basin Dam on Basin Creek, approximately 3 miles upstream from its confluence with the Animas River. To retain 120,000 acre-feet, and provide for flood storage, requires a dam with a crest elevation of 6,892 feet. Ridges Basin Dam will be a rolled earthfill structure with a height of about 217 feet above the streambed. The dam site is defined by narrowing of the downstream end of Ridges Basin with a prominent sandstone ridge to the left (northeast) of Basin Creek and two sandstone, and siltstone ridges about 500 feet apart to the right. The preferred dam alignment for the 120,000 acre-feet capacity reservoir will use the prominent sandstone for the left abutment and the more upstream of the two ridges for the right abutment. This is the same alignment that was selected for the larger dam described in the 1996 FSFES. With the smaller dam now proposed, the right abutment of the planned embankment would not encounter the coal bearing formation that was a concern in the 1980 FES. The valley floor at the dam site is covered with 40 to 90 feet of alluvial deposits over shale with lesser amounts of sandstone near the abutments. The alluvial material consists of sandy clay, clayey sand, and lean clay with varying amounts of gravel. Groundwater lies 30 to 40 feet below the surface and close to the bottom of the deeply eroded creek channel. Construction materials available are impervious clay in a borrow area within the reservoir area, and pervious material including boulders, cobbles, gravel and sand in borrow area B, a terrace, 2 miles downstream.

The proposed design for Ridges Basin Dam would accommodate these formations and materials with a zoned earthfill dam containing a thick impervious core bordered by filters and drains and supported by sloping pervious shells upstream and downstream. The upstream slope would be 3:1 (horizontal to vertical) below the bottom level of active storage and a bench of 20 feet with a 2:1 slope above that level. The core would bear directly on the foundation rock and the compressible alluvium removed both upstream and downstream for placement of the shell of the dam. Foundation exposure for construction would require a soil-bentonite cutoff wall upstream of the upstream toe of the dam with dewatering wells. This is a different concept from that proposed for the larger dam described in the1996 FSFES.

The previous design employed a wick drain system and pre-loading to consolidate the upstream alluvial material rather than removing it. The current design involves a much smaller quantity of material and eliminates the two-stage construction delay of the prior design where foundation consolidation had to occur before embankment construction could proceed. Construction quantities include approximately 2.6 million cubic yards of foundation excavation and 5.6 million cubic yards of zoned fill. A tunnel through the left abutment would serve as the reservoir outlet. The outlet works include an intake approach channel, intake structure, an upstream pressurized tunnel, gate chamber with access adit, open channel flow downstream tunnel, and stilling basin and discharge channel. The main gates would have an emergency release capacity

of 1,500 cfs while secondary jet-flow valves would control releases of up to 100 cfs and 150 cfs. Flanges would be provided to connect future distribution pipelines. Basin Creek drops about 420 feet elevation along its 3.2-mile course from the dam to the Animas River.

Planned releases into Basin Creek range from 25 to 100 cfs with a possible future increase of up to 250 cfs. These releases exceed recorded flows in Basin Creek and improvements would be required to control the velocity and restrain silt transport to the Animas River. Access for construction activities would be from CR 211 and space for construction equipment and supplies would be located in the reservoir basin. Future access for operation and maintenance would connect with CR 213, La Posta Road, and proceed along the general alignment of existing private roads to borrow area B, then along the northerly canyon side up Basin Creek to the dam. A roadway across the downstream slope of the dam would provide access to the dam crest at the right (southwest) abutment.

The reservoir formed behind the dam is expected to flood an area of approximately 1,500 acres and extend about 2.4 miles up Basin Creek, with a capacity of 120,000 acre-feet. The reservoir would include useable storage of 90,000 acre-feet with a recreational pool of 30,000 acre-feet for recreation and to maintain a fishery. The reservoir is expected to be drawn to the 30,000 acre-feet level during extended periods of drought. The only mode of water release from Ridges Basin Reservoir identified at this time, is through the dam outlet works (i.e., left abutment tunnel and spillway) down Basin Creek.

3.1.4 Basin Creek Conveyance

Reclamation proposes to use Basin Creek as a means to convey project water from Ridges Basin Reservoir to the Animas River for future project demand. The conveyance system is designed for releases of up to 250 cfs, but the periodicity and timing of releases are undefined at this time. Since historic average daily high flows in Basin Creek are only 65 cfs, channel modification will be required. Reclamation proposes to reduce the impact to Basin Creek channel wetlands and riparian vegetation by means of erosion and siltation controls that use a series of check and drop structures, or vortex weirs. According to Reclamation, the implementation of these controls would produce an increase in silt transport initially but would stabilize with use. Some wetlands could be created over time. The creek bed would be realigned into gentle curves and graded to create relatively flat slopes. The checks across the creek bed would be about 60 feet wide, with a depressed 10-foot wide weir in the center. A damp area approximately 50 feet wide by 2.5 miles or longer may provide about 15 acres of wetland development.

3.1.5 Farmington to Shiprock Water Pipeline

The Farmington to Shiprock water pipeline will deliver 4,560 acre-feet (2,340 acre-feet of depletion) of M&I water from the ALP. This is part of the 57,100 acre-feet of depletion allowed under full development of the ALP. The 4,560 acre-feet of water represents about one-half of the M&I requirements of the eight Navajo chapters located along the route of the pipeline. These

eight chapters include: Shiprock, Cudei, Hogback, Nenahnezad, Upper Fruitland, San Juan, Sanostee, and Beclaibito. The Farmington to Shiprock pipeline will be approximately 29 miles long, and will replace an existing ductile iron line. The new pipeline will follow the same alignment as the old pipeline. The replacement pipeline will begin at the western boundary of the City of Farmington on the north side of the San Juan River and terminate at the Cortez storage tanks in Shiprock. The diameter of the pipeline will be 24 inches at its beginning and decrease to 20 inches at its terminus in Shiprock.

The first reach is 69,373 feet long and has a diameter of 24 inches. The first reach has 32 turnouts and supplies water to the Upper Fruitland Chapter, parts of the San Juan Chapter, and potable water for the Navajo Agricultural Product Industries. The elevation where the pipeline begins in the City of Farmington is 5,230 feet. The second reach begins north of Morgan Lake and ends at the eastern boundary of the Hogback Chapter. It is 22,800 feet long with a diameter of 20 inches. This reach has nine turnouts and serves Nenahnezad and the area around Morgan Lake. The initial elevation of this reach is 5,360 feet. At the end of this reach, a 16-inch diameter concrete siphon conveys water from the south side to the north side of the San Juan River. The final reach of the Farmington to Shiprock Pipeline is 59,200 feet long and has a diameter of 20 inches. The final reach has 21 turnouts and supplies water to the Bureau of Indian Affairs and the greater Shiprock community and outlying areas. The final reach ends at the Cortez Tank in Shiprock at an elevation of 5,120 feet. Two existing siphons will need to be replaced or supplemented. One is located near the Farmington border and the other is located near the Hogback diversion on the San Juan River. Also, an additional 7 million gallons of storage tank capacity will be required. Currently, there are two alternatives proposed for the crossings of the San Juan River. Direction boring has been proposed, however, this method may not be feasible given the substrate within the river bed. The other alternative involves the use of coffer dams to place the pipeline beneath the river bed.

3.1.5 Relocation of Natural Gas Pipelines

There are currently four buried natural gas/petroleum byproduct pipelines that run east and west across Ridges Basin, and are owned by Northwest and Mid-American Pipeline Companies. The portion of these pipelines, within Ridges Basin will have to be relocated since they lay across the footprint of the proposed reservoir. An alternate route for these pipelines has not been identified at this time, however, several alternatives were evaluated in the Service's February 19, 1999, PAM. Reclamation has informed the Service that the Carbon Mountain route selected in 1996, has been abandoned, and is no longer under consideration.

3.1.6 Relocation of County Road 211

As a result of inundation of Ridges Basin, CR 211 will be flooded for most of its length through the basin. At this time, there are two alternatives being considered for the relocation of CR 211 (Figures 1 and 2). These include the shoreline route, which would run east and west along the north shore of the reservoir, connecting with the existing CR 211 between south Durango and

State Highway 141. The Rafter J route would run north and west from the north shore of the reservoir to State Highway 141 near Wildcat Canyon. The remaining portion of CR 211, west of the reservoir, would be discontinued for a distance of about 2.5 miles, with access to private property only from State Highway 141 west of Ridges Basin.

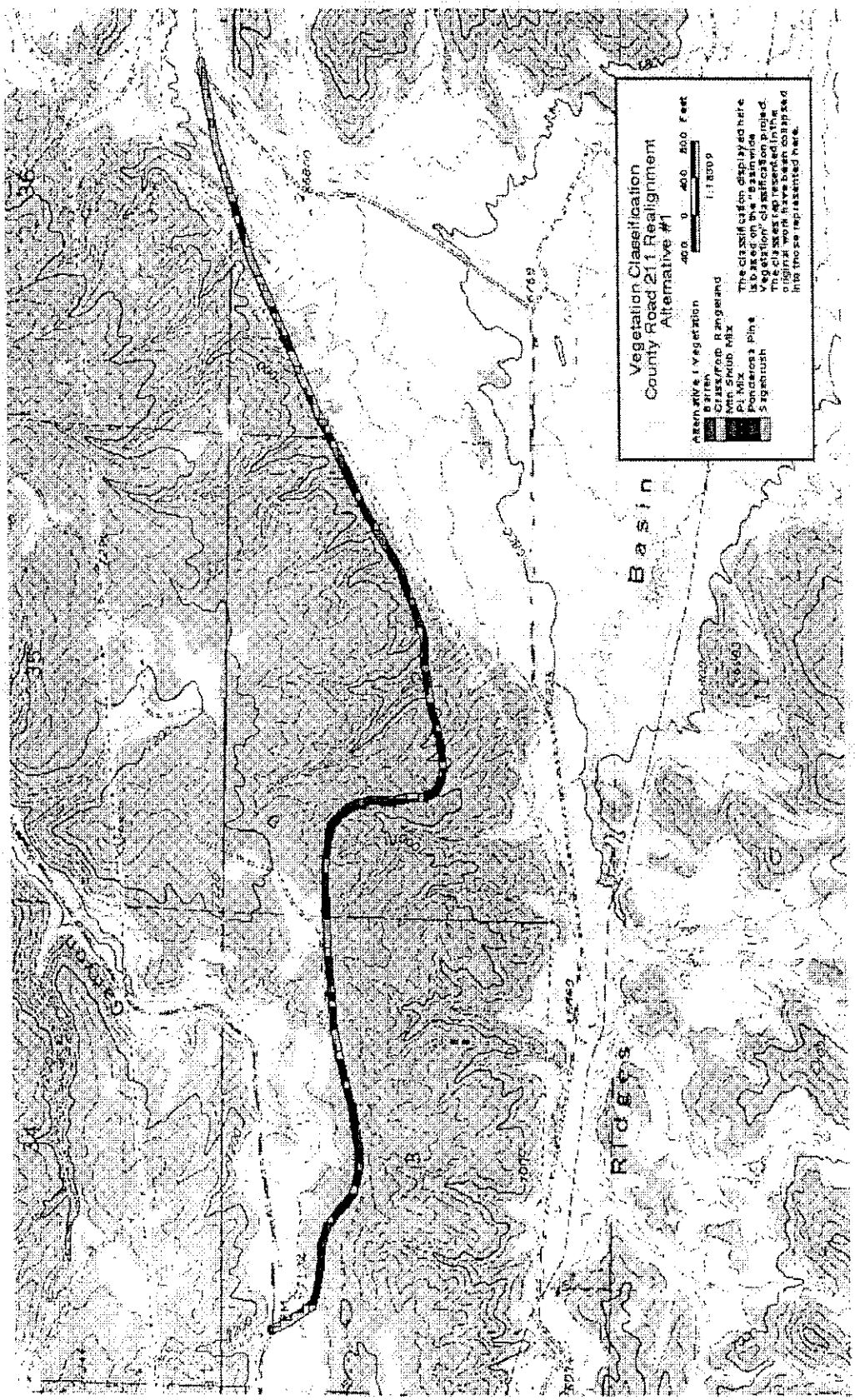

Figure 1. Rafter J Alternative for relocation of County Road 211.

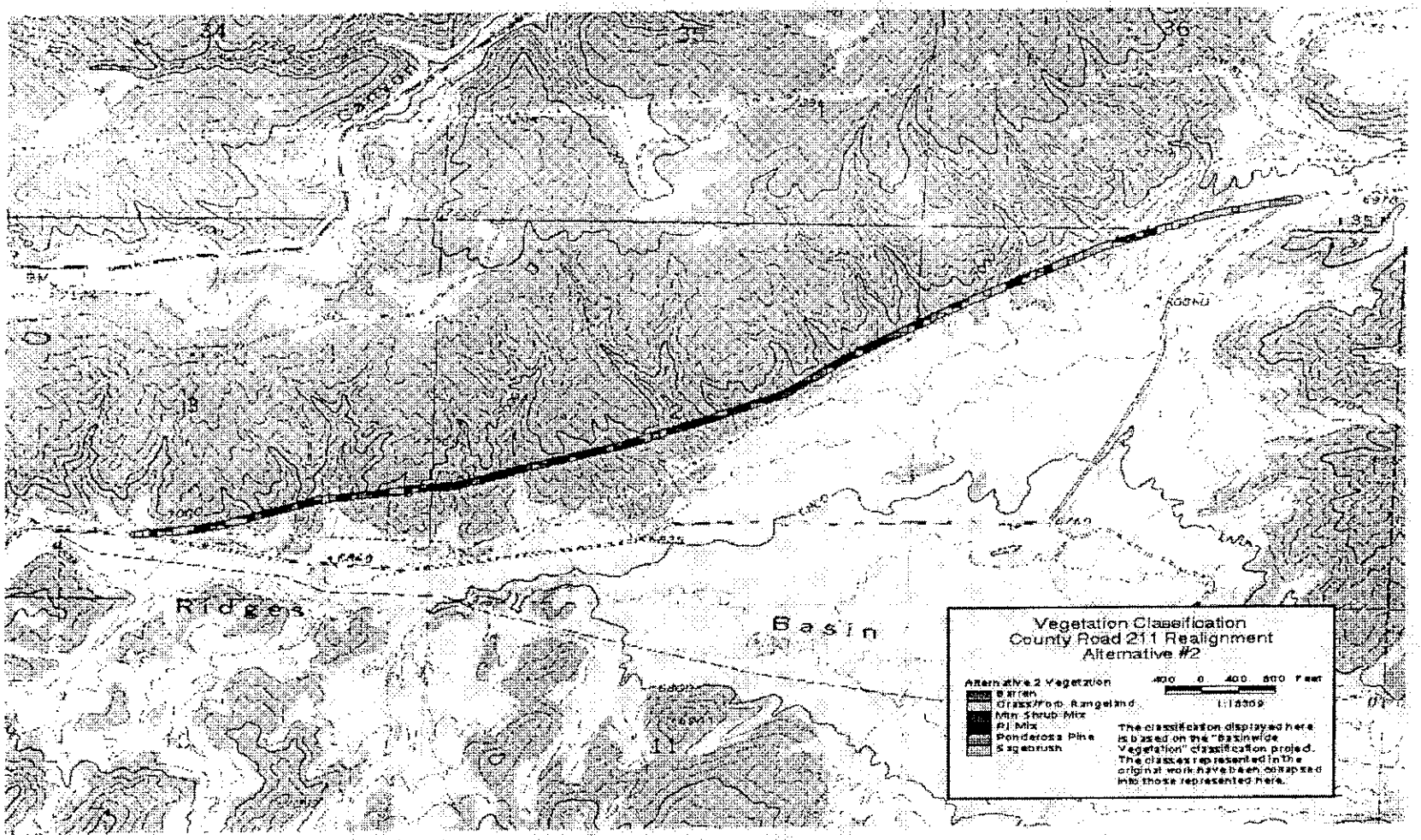

Figure 2. Shoreline Alternative for the relocation of County Road 211.

3.1.7 Land Based Recreation at Ridges Basin

Reclamation has not committed to any land based recreation at this time, however in order to be consistent with the DSEIS, the Service will include the same information currently being evaluated for the current DSEIS. Land based recreation around Ridges Basin Reservoir is expected to be approximately two-thirds of that described in the 1996 FSFES. Expected recreation components are as follows: 10 miles of hiking trails, 196 camping units, 37 picnic units, 1 group picnic unit, a 4-lane boat ramp with 26 boat slips, 591 parking stalls, an entrance station, fish cleaning station, beach area, and an administration building.

3.2 PROJECT ALTERNATIVES

Ten project alternatives were evaluated leading to the selection of a preferred agency alternative. The preferred agency alternative is similar to Alternative 4. The 10 alternatives were described and evaluated in the July 15, 1999 PAM, and included the following.

3.2.1 Alternatives 1-4

Alternatives 1-4 were variations of The Administration Proposal, which includes both structural and nonstructural components. Structural components included an off-stream storage reservoir within Ridges Basin (capacities of approximately 90,000, 105,000, 120,000, or 135,000 acre-feet), with no inactive storage and only a limited amount of "dead" storage, a pumping facility (up to approximately 240 cfs capacity), and a reservoir inlet conduit, all designed to deplete no more than an average of 57,100 acre-feet per year.

The nonstructural component consists of, primarily, a one-time fund of approximately $40 million to allow for purchase of additional water rights. Under the allocation of depletion amounts described in the Notice Of Intent, the Tribes are still approximately 13,000 acre-feet per year short of the total, allowable quantity of depletion recognized in the settlement agreement. The nonstructural element would establish and utilize a water acquisition fund which the Tribes could use to acquire water rights on a willing buyer/willing seller basis. However, to provide flexibility in use of the fund, authorization would allow some, or all, of the funds to be redirected for on-farm development, water delivery infrastructure, and other economic development activities.

Non-binding scenarios are assumptions associated with the administration proposal that the Tribes will develop the water in some way. Water use scenarios have been preliminarily discussed to provide information about how the water could be used by the Tribes in the future. The Tribes are not bound by these scenarios and may choose not to adopt any of the scenarios and develop the water from the project in other ways.

3.2.2 Alternative 5

The Animas-La Plata Reconciliation Plan was similar to Alternatives 1-4, except that the proposed Ridges Basin Reservoir was approximately 260,000 acre-feet in size. Use and conveyance of project water would be the same as described in the non-binding scenarios for Alternatives 1-4.

3.2.3 Alternative 6

The Citizen's Coalition Alternative has several components that could be used in any combination. Central to the alternative is the development of a legacy fund for land and water acquisition. It was difficult to evaluate environmental impacts associated with this component because of the large number of associated options. Implementation of Alternative 6 could involve the conversion of, or complete loss of wildlife habitats. At the time of acquisition of land or water associated with monies from this project, Reclamation must consult with the Service concerning any federally listed species that could be affected by a change in land or water use on the property to be acquired, as well as other wildlife habitats that would be effected. This alternative also included water available through existing projects.

3.2.4 Alternative 7

This alternative was analogous to Phase 1, Stage A of the 1996 FSFES. This alternative consisted of a Ridges Basin Reservoir of approximately 274,000 acre-feet capacity. Impact analysis is available in the 1996 FSFES. Analysis of impacts resulting from this alternative were updated with current information.

3.2.5 Alternative 8

This alternative included the Administration Proposal along with the addition of other components to supply water to non-Ute water users. One of the components of this alternative could be Aztec Reservoir, which would require another pumping facility on the Animas River and conveyance system to the basin. This alternative could also include components described in alternative 6 above: Pine (Los Pinos) River drainage, Lemon Reservoir and the Florida River Drainage, Dolores Project/McPhee Reservoir.

3.2.6 Alternative 9

The Citizens' Progressive Alliance Alternative incorporated a revenue stream derived from the principal water users undiverted water supply, which would generate hydro-power downstream. The second component of this alternative described water available from other federal projects as described in Alternative 6 above. Impacts would be similar to those in Alternative 6. If water remained in the Animas River, and revenue generated from that water was used to purchase land

and or water rights, impacts of this scenario could be similar to what was described in Alternative 1 above, referring to the $40 million acquisition fund.

3.2.7 Alternative 10

The No Action Alternative would not include any construction activities. Land and water use would remain the same.

4.0 EVALUATION METHODOLOGY

4.1 AQUATIC RESOURCES

4.1.1 Instream Flow

The impacts of pumping water from the Animas River were evaluated using hydrology and channel cross sectional information developed and provided by Reclamation. After superimposing project hydrology on the historic period of record 1929 to 1998, mean monthly flows, based on daily means, were computed to evaluate the most likely monthly and seasonal schedule of the pumping plant and the resulting river flows. Flow duration curves were developed for representative dry, average, and wet years. Projected daily flows were used with known stage-discharge relationships for ten cross sections, and area and percentage change in wetted perimeter were determined using hydraulic modeling (Miller Ecological Consultants 1999). Stream bottom and water surface elevation data were used from a previous study (Lyons 1994), in which the Animas River was partitioned into three reaches based on hydrologic, geomorphic, and channel criteria. Within these reaches, data were collected at nine separate sites: Reach 1, 12 miles from the proposed Durango Pumping Plant downstream to the confluence with the Florida River, and includes sites 1, 2A, 2B, and 2C; Reach 2, approximately 19 miles from the Florida River downstream to Aztec, New Mexico, and includes sites 3, 4D, and 5; and Reach 3, 15 miles from Aztec, New Mexico downstream to the confluence with the San Juan River, and includes sites 6 and 7B-1, and 7B-2 (lower 0.5 miles).

Relationships between discharge and various hydraulic parameters were developed for all nine sites using the hydraulic modeling software RHABSIM (Thomas R. Payne and Associates 1998). For each site, two transects, one characteristic of riffle habitat, and one characteristic of run habitat, were selected. For each selected transect, time series analysis was performed by using wetted perimeter versus discharge and average depth versus discharge curves. Hydrology was compiled for water years 1929 to 1993 by Keller-Bliesner Engineering. Project related depletions were imposed on baseline flows for the compiled water years. Discharge data used included, Animas River above pumping plant (Site 1), Animas River below pumping plant (Site 1, surrogate), Animas River below Basin Creek (Site 2A), Animas River above Florida River (Sites 2B and 2C), Animas River above Farmington (Sites 3, 4D, and 5), and Animas River above San Juan (Sites 6 and 7B-1, and 7B-2). Due to the absence of an established, measured

site, Site 1 was used as a representative site for the area upstream of the Durango Pumping Plant. The water years 1951, 1949, and 1945, used for the 1996 FSFES, were selected to represent dry, wet, and average years, respectively.

4.1.2 Riverine Fish Populations

Fish populations in the Animas River were surveyed by Reclamation using electrofishing rafts during late summer in 1991, 1993, 1994, and 1996. Synoptic sampling for young trout fry and native fish larvae was also conducted along shorelines with dip nets. A single mark-recapture population estimate was made of trout during 1993.

Impacts of instream flow changes to the Animas River were evaluated for shoreline nursery habitats and adult holding, feeding, and spawning areas as a function of reduction in flow, flow stage, and wetted perimeter. Cause-effect relationships between stream flow, fish habitat, and fish populations are not quantified for the Animas River at this time. Reduction in flow which results in a significant reduction in water depth and wetted perimeter is assumed to have a negative impact on fish habitat and on fish populations. The degree of impacts; however, cannot be assessed at this time. An ongoing monitoring program is a key element to continued evaluation of impacts to fish populations (see Section 7.1).

Fish surveys were not conducted in Basin Creek. Basin Creek is a small ephemeral stream that would not be expected to support a fish community because of its small size and ephemeral nature.

4.1.3 Reservoir Limnology

The limnology of Ridges Basin Reservoir was evaluated from examination of reservoirs of similar size and elevation near the project area, including Farmington, Vallecito, and Navajo reservoirs (Lamarra 1999). Vertical profiles of temperature, dissolved oxygen, and dissolved nutrients (nitrogen and phosphorous) were recorded for these reservoirs to predict the timing and depth of temperature stratification and thermocline formation. The thermocline, or mesolimnion, is characterized by greater than 1 °C vertical temperature change per meter of water, and is located between an upper, warmer, oxygenated layer known as the epilimnion; and a lower, colder, anoxic layer known as the hypolimnion. Understanding the time of year and the depth at which a thermocline forms is essential to knowing the potential of the reservoir for supporting fish year around. The area and depth of the reservoir were derived from digitized elevation contours of Ridges Basin.

Projected nutrient concentrations were determined from an examination of water quality in the Animas River near the proposed pumping plant. Using estimated turnover time for water in the reservoir, as well as the degree of aerobic or anaerobic conditions, the potential for concentration of nutrients, and the bioaccumulation of heavy metals, and non-metallics were also evaluated. In addition, tissues of fish from Farmington Reservoir, which is filled by water diverted from the

Animas River, were assayed for non-metallics (selenium) and heavy metals (mercury) to provide insight on potential bioaccumulation in fishes in Ridges Basin Reservoir.

4.2 TERRESTRIAL RESOURCES

4.2.1 Vegetation

Agreement was reached between the Service, CDOW, and Reclamation to use vegetation mapping supplied by CDOW to evaluate terrestrial wildlife habitat impacts and to use the same system for evaluating potential mitigation sites. Vegetation in Ridges Basin was mapped from Landsat satellite images, which were terrain corrected and geo-referenced. Initially, 13 vegetative and ground-cover categories were identified and these were pooled into six upland habitat categories, including: barren ground, grass/forb, mountain shrub mix, ponderosa pine, pinyon-juniper mix, and sagebrush. The area of upland habitat flooded by Ridge Basin Reservoir was assessed as the basis for mitigation.

4.2.2 Wildlife

Impacts to wildlife resources were evaluated based on the loss of upland and riparian-wetland habitats important to the survival of these species. In addition, the value of Ridges Basin as a migratory route for wildlife was evaluated, and must be considered for mitigation.

4.3 RIPARIAN-WETLANDS

Direct impacts to riparian-wetland habitats that would result from the construction of the project were estimated based on mapping that was completed by Reclamation for Ridges Basin in 1992, and for the Animas River in 1995 (Reclamation 1992; 1995a, respectively). The mapping identifies and delineates riparian-wetlands based on habitat type. In 1995, Reclamation also mapped riparian-wetlands along a 1.5 mile (approximately) reach of Basin Creek located immediately downstream of the Ridges Basin Dam site (Reclamation 1995b).

Reconnaissance-level site inspections were completed by Reclamation and Service personnel in the summer of 1999 to identify riparian-wetland habitats along unmapped reaches of Basin Creek and the Farmington to Shiprock water pipeline. Actions that would result in the permanent placement of fill material into riparian-wetlands or the flooding of riparian-wetlands were considered long-term impacts. Actions that would result in the short-term loss of riparian-wetland vegetation were considered temporary impacts.

Indirect impacts to riparian-wetland habitats that would result from the operation of the project were evaluated. The evaluation was based on how flow reductions were predicted to affect depth-to-groundwater and over-bank flooding within the Animas River floodplain. The analytical methods that were developed by Reclamation (1995c) for the 1996 FSFES were used

as guidelines to evaluate the indirect impacts that could occur downstream of the Durango Pumping Plant.

Because the operation of the Project is not expected to significantly change the hydrology of the San Juan River, flow-related impacts to riparian-wetlands are not anticipated. Any flow-related changes to riparian-wetlands along the San Juan River are more likely to occur as a result of the reoperation of Navajo Dam.

Flow-related impacts to riparian-wetlands associated with Basin Creek were not analyzed in great detail because an operational plan for dam releases is not available at this time.

Mitigation for riparian-wetland impacts was based on the replacement of in-kind habitat type and ecological functions.

4.4 ENDANGERED SPECIES

All species listed as threatened or endangered under the Endangered Species Act of 1973, as amended, that may occur within the project area, were considered. Determination of occurrence or possible occurrence was based on previous investigations by the Service, Reclamation, NMDGF and CDOW. A list of species was presented in the 1996 FSFES. The status of some of these species has changed since 1996, and is reflected accordingly in this report. Although mentioned in this report, the evaluation of effects to threatened or endangered species will be fully addressed in Reclamation's biological assessment and the Service's biological opinion.

5.0 FISH AND WILDLIFE RESOURCES WITHOUT THE PROJECT

5.1 AQUATIC RESOURCES

5.1.1 Fish Habitat and Populations of the Animas River

Fish habitat in the Animas River varies longitudinally from a moderately steep boulder-dominated channel supporting cold-water trout species, to a more gentle meandering river with cobble/gravel bars at lower elevations and supporting warm-water species. Seven species of fish are native to the Animas River, and 11 introduced species are reported (Table 1). The Colorado pikeminnow and razorback sucker are federally listed as endangered, and occur downstream in the lower San Juan River, but are extirpated from the Animas River. The flannelmouth and bluehead suckers are common, but the populations consist mostly of adults. Roundtail chub are rare in the Animas River. Speckled dace and mottled sculpin are common and abundant, respectively.

Table 1. Fish species reported from the Animas River.

Common Name	Scientific Name	Status-Abundance
Native Species		
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered-Extirpated
razorback sucker	*Xyrauchen texanus*	Endangered-Extirpated
flannelmouth sucker	*Catostomus latipinnis*	State Sensitive-Common
bluehead sucker	*Catostomus discobolus*	State Sensitive-Common
roundtail chub	*Gila robusta*	Listed Endangered in NM
speckled dace	*Rhinichthys osculus*	Common
mottled sculpin	*Cottus bairdi*	Abundant
Introduced Species		
rainbow trout	*Oncorhynchus mykiss*	Sport Fish-Common
Snake River cutthroat trout	*Oncorhynchus clarki carmichaeli*	Sport Fish-Common
brown trout	*Salmo trutta*	Sport Fish-Common
brook trout	*Salvelinus fontinalis*	Sport Fish-Rare
channel catfish	*Ictalurus punctatus*	Sport Fish-Rare
black bullhead	*Ameiurus melas*	Sport Fish-Rare
white sucker	*Catostomus commersoni*	Non-Sport Fish-Numerous
common carp	*Cyprinus carpio*	Non-Sport Fish-Numerous
fathead minnow	*Pimephales promelas*	Non-Sport Fish-Numerous
red shiner	*Cyprinella lutrensis*	Non-Sport Fish-Numerous
johnny darter	*Etheostoma nigrum*	Non-Sport Fish-Rare

The principal sport fishes in the Animas River are rainbow trout, brown trout, and Snake River cutthroat trout. Rainbow trout and Snake River cutthroat trout are currently stocked by the Service for the Southern Ute Indian Tribe. Whirling disease (*Myxobolus cerabralis*) was recently found in the State fish hatchery in Durango, but has not been confirmed in the Animas River. Whirling disease is a nonnative protozoan parasite known to consume cartilage of young salmonids and cause high rates of mortality.

Surveys conducted jointly by the CDOW and the SUIT (Japhet and Whiteman 1997, 1998) in the Animas River near Santa Rita Park (formerly Gateway Park) in 1991, 1993, 1994, and 1996 yielded seven fish species and one hybrid form; brown trout, rainbow trout, Snake River cutthroat trout, flannelmouth sucker, bluehead sucker, mottled sculpin, white sucker, and white x bluehead hybrids. In 1997, the section between Santa Rita Park and U.S. Highway 160/550 "High" Bridge was designated as Gold Medal trout water (Japhet, CDOW, pers. comm.). Densities and standing crop biomass of trout are presented in Table 2.

Table 2. Summary of trout biostatistics for the Animas River south of Durango, Colorado. A two trout, 16 inches and over, flies and lures only regulation was made effective in this section January 1, 1993. Stream Survey Data, CDOW files.

Month/Year---->	10/91	11/93	09/94	09/96
All trout combined (fish/acre)	61	53	56	146
Total trout biomass (pound/acre)	64	51	43	128
All trout ≥14 inches (fish/acre)	21	22	17	61
Rainbows ≥14 inches (fish/acre)	10	9	9	38

These surveys have consistently shown that aquatic habitats for native fishes in the Animas River are abundant from Durango downstream to a few miles into New Mexico. In New Mexico, the habitats are degraded and limited by the combination of irrigation diversions, channelization, degraded water quality, agriculture, and housing along the river banks. Flow of the Animas River in New Mexico is severely depleted by irrigation diversions from about April through October, especially downstream of the town of Aztec. Irrigation returns, runoff, and low flows have also degraded water quality. The combination of low flows, habitat degradation, and degraded water quality have greatly depleted fish populations in the lower Animas River. As such, trout species are rare and native fishes are found in very low numbers.

Electrofishing surveys by the SUIT in 1998 (Whiteman 1999) and in 1999 (pers. comm., S. Whiteman, Southern Ute Indian Tribe) consisted of continuous sampling from "Purple Cliffs" (river mile 57) near Durango, Colorado downstream to the Animas Ditch Diversion near the town of La Posta, Colorado (river mile 48). These surveys showed a longitudinal variation in abundances, with rainbow trout, cutthroat trout, and brown trout most abundant in upper reaches, and increasing downstream abundances of flannelmouth suckers and bluehead suckers. Approximately 60 percent of all fish sampled consisted of the three most abundant trout species, including rainbow trout (29.3 percent), brown trout (15.4 percent), cutthroat trout (12.9 percent), and common carp, white sucker, and white sucker hybrids (2.7 percent in total). The presence of fingerling rainbow trout and brown trout indicate that natural reproduction is occurring for these species, but recruitment of rainbow trout is not sufficient to maintain populations and the fish are stocked throughout this reach of river. Longitudinal distribution, length-frequency, and abundance of the trout species strongly reflects stocking activities and fishing regulations.

Native fishes were about 40 percent of total fish abundance with bluehead suckers (28.3 percent) and flannelmouth suckers (11.4 percent) dominant. These species were common in deep pools and runs with instream boulder cover. Although mottled sculpin, and speckled dace were not enumerated, mottled sculpin were abundant in deep runs and shallow riffles. Length-frequency analyses show a predominance of adult suckers and a virtual absence of young fish. Larval and post-larval flannelmouth and bluehead suckers are found locally in large numbers in spring, but are absent thereafter. One hypothesis for this absence is that these young fish drift downstream to utilize lower reaches of the Animas River and/or the San Juan River, and return to the upper reaches after maturing and for spawning. An alternate hypothesis is the loss of most of larvae from local mortality such as predation or spring floods, or from fish moving downstream below barriers (e.g., irrigation diversions) that prevent the fish from moving back upstream. Roundtail chub have been found in the lower Animas River in small numbers; two were captured in a previously unsampled area in September 1999, in deep pools with rock substrate and cover and beneath overhanging streambank vegetation. The roundtail chub is considered as a species of special concern by the State of Colorado as well as by the SUIT and listed as endangered in New Mexico (Probst 1999).

In past studies, numerous suckers collected near the Florida River confluence were afflicted with external lesions. Subsequent analysis of these lesions revealed the presence of an opportunistic bacterial fish disease (furunculosis), which is often a secondary infection related to environmental stress. It is possible there is a relationship with the onset of symptoms of this disease and exposure to relatively high levels of polyaromatic hydrocarbon contaminants in fish samples in the lower Animas River. Several fish were tested by Reclamation, and the results confirmed the presence of high levels of PAHs in their tissues.

5.1.2 Basin Creek Conveyance

Basin Creek is a small tributary that converges with the Animas River about 5 miles below the proposed Durango Pumping Plant. Natural flows of Basin Creek are extremely variable, with instantaneous peaks of greater than 100 cfs. A single year of flow data showed mean daily flows from 0 to 62 cfs. The only fish species believed to inhabit the creek is the speckled dace. Trout from the Animas River may use the mouth of Basin Creek. Surveys of fish in Basin Creek have not been conducted since this stream is intermittent and not believed to have an established fishery resource.

5.1.3 Fish Habitat and Populations of the San Juan River

Habitat and fish populations of the San Juan River are described in a series of technical reports developed by the San Juan River Recovery Program. These are summarized in the flow recommendations report (Holden 1999).

5.1.4 Endangered Species

No endangered aquatic species are presently known to inhabit the Animas River. The federally endangered Colorado pikeminnow and razorback sucker, occur in the San Juan River below the confluence of the Animas River. Flow recommendations for the San Juan River (Holden 1999) have been developed by an interagency team of scientists representing Reclamation, the Service, Bureau of Land Management, New Mexico Department of Game and Fish, Utah Division of Wildlife Resources, and private contractors. Flow recommendations were required as part of the Reasonable and Prudent Alternatives of the Service's 1991 biological opinion, and are considered to provide necessary conditions for the continued existence and recovery of these two endangered fish species.

5.2 TERRESTRIAL RESOURCES

5.2.1 Vegetation

The Durango Pumping Plant will be positioned on the west bank of the Animas River, near Santa Rita Park. This is the former site of a mill tailings pile which has since been reclaimed and revegetated with native grasses.

The water delivery conduit from the pumping plant to Ridge Basin Reservoir crosses slopes of well drained fluvial material vegetated by a mix of pinyon-juniper, Gambel oak, various shrubs, and some ponderosa pine.

The corridor for the electrical transmission lines that provide power to the pumping station is not known at this time. Potential impacts will be addressed when the route is identified.

Acreage and relative abundance of vegetation types within Ridges Basin are described in (Table 3). The basin supports lesser amounts of Gambel oak and ponderosa pine, as well as a narrow band of riparian habitat along Basin Creek. Wetland vegetation within the basin is not included in the table, because of an agreement that 121 acres of wetland mitigation will be a project component of the preferred alternative.

Inundation of Ridges Basin will require the relocation of four pipelines, CR 211, and an electrical transmission line that passes through the basin. Several alternatives have been identified for relocation of three of the pipelines, however at this time, a preferred route has not been selected. Regardless of the route selected, it will likely pass through an area that consists of vegetation communities similar to those found within Ridges Basin. The forth pipeline follows CR 211 through its current alignment and will likely be relocated to the north on the east-west ridge. Relocation of CR 211 will likely affect vegetation similar to that found along its current alignment. The electrical transmission line requires realignment, and will likely be relocated in or near a preexisting right-of-way that follows the east-west ridge line on the north edge of

Ridges Basin. Vegetation in or near this right-of-way is similar to that occurring within the basin.

Table 3. Ground cover and vegetative categories for the footprint of the proposed Ridges Basin Reservoir at 120,000 acre-feet (excludes wetlands/riparian areas). Data furnished by CDOW.

Category	Surface Area (acres)	Percent
Sagebrush	509.2	34
Grass/Forb	378.6	26
Mountain Shrub Mix	317.1	21
Pinyon/Juniper Mix	221.3	15
Barren Ground	53.8	4
Ponderosa Pine	2.2	<1
Totals	~1,482	100

5.2.2 Wildlife

A variety of wildlife species occur in the project area. Appendix A, provides several lists of the bats, birds, reptiles and amphibians, large, medium, and small mammals that are known or likely to occur in the project area.

The site of the proposed pumping plant does not support large populations of wildlife, except for small mammals and possibly transient big game species. The water inlet conduit from the pumping plant to Ridge Basin Reservoir crosses slopes that may be used as part of a dispersed migration corridor by deer and elk. However, the primary migration corridor is from Ridges Basin to the north and west.

In 1974, the CDOW purchased a working ranch of 7,503 acres (including a large portion of Ridges Basin), and established Bodo State Wildlife Area as elk winter range. Approximately half of the BSWA (3,995 acres) was condemned by Reclamation for Ridges Basin Reservoir under the previous project as described in the 1996 FSFES. In 1977, CDOW estimated an average of 200 elk wintered on BSWA, with about 50 animals residing year-around and calving on the north ridge. Since BSWA was established, CDOW estimates that elk use of the area has roughly doubled. Currently, CDOW estimates that there is a resident elk herd of 75 animals with approximately 400 using the basin and surrounding area as winter range. Elk wintering on BSWA are part of the Hermosa herd that summers in the San Juan Mountains to the north and migrates to winter in lower elevations near Durango. The majority of this herd winters west of Durango and north of State Highway 160 in the Perins Peak/Twin Buttes area, although several hundred animals cross Highway 160 to winter on the Bodo property and in the Ridges Basin

area. A movement corridor has been identified by CDOW at the west end of Ridges Basin for animals moving south onto the Southern Ute Indian Reservation.

In 1977, an estimated 100-250 mule deer wintered on the BSWA. It is assumed that these animals were also migrants from the San Juan Mountains. Currently, there are approximately 300 resident deer in and around Ridges Basin, and approximately 1000 animals migrating through the basin to winter, or reach wintering areas (Scott Waite, CDOW, pers. comm.). Small numbers of wild Merriam's turkeys have been reported in the project area, as well as transient black bear and mountain lion. Waterfowl, including dabbling ducks used small ponds, and occasionally nested in the basin. Two golden eagle nests are located on the west face of Carbon Mountain at the east end of Ridges Basin. These nests are used alternately by a pair of eagles. Two young were fledged by this pair in 1999.

5.3 RIPARIAN-WETLANDS

5.3.1. Ridges Basin

Reclamation, Service, and EPA biologists mapped a total of 121 acres (49 ha) of wetlands in Ridges Basin during April 1992 (see Animas-La Plata Project Special Report: Additional Wetland and Wildlife Issues, Bureau of Reclamation, June, 1992). These were comprised of both naturally occurring and remnants of irrigation-induced wetlands. Mapping included all wetland habitats, whether or not they were jurisdictional under Section 404 of the Clean Water Act. An attempt was made to include irrigation-induced wetland habitat which was lost when irrigation was discontinued in 1988. This was done by trying to reconstruct their distribution and nature based on remnant wetland evidence and discussions with Division personnel familiar with the basin and its Division management history.

Based on the 1992 studies, riparian-wetlands within Ridges Basin were described to occur along Basin Creek and in areas that were influenced by irrigation practices. In general, four types of riparian-wetland habitats occurred within the basin; open water, cattail marsh, wet meadow, and emergent channel wetlands.

The majority of the riparian-wetlands appear to have been associated with irrigation practices. Open water and cattail marshes were mainly associated with old stock ponds. Wet meadows mostly occurred within low-lying areas and depressions that received irrigation return flows.

Emergent channel wetlands are mainly associated with Basin Creek and its tributaries. Within Ridges Basin, Basin Creek is a small, intermittent stream channel with a very limited floodplain. Small, discontinuous patches of emergent vegetation occur along the stream channel, but there are no stands of cottonwoods or willows.

A more detailed and quantitative description of these riparian-wetland habitats is provided in Appendix H of the FSFES.

5.3.2. Basin Creek

The 1.2 mile reach of Basin Creek, located immediately downstream of the proposed dam site, appears to receive intermittent flows. The lower 2.8 mile reach of Basin Creek, located above the Animas River confluence, appears to maintain perennial flows. Below the proposed Ridges Basin Dam site, Basin Creek flows through a narrow and deeply incised canyon. Subsequently, the stream channel and its floodplain are often entrenched. The channel is dammed at several locations to create stock water ponds. Small, discontinuous patches of cottonwoods, aspen, and willows occur along the creek throughout most of its length in the canyon. Patches of emergent wetlands dominated by sedges, rushes, bulrush and cattails also occur along the creek, but appear to occur most frequently in association with stock ponds. In general, riparian-wetland habitats occur more frequently within the creek's perennial reach.

5.3.3. Animas River Valley

From Durango, Colorado to Flora Vista, New Mexico, the Animas River is generally confined within a bedrock valley that is 100- to 400-feet wide. The river valley has a relatively narrow riparian zone that frequently abuts steep, bedrock walls. For the purposes of this report, the riparian zone is defined as that area that supports riparian-wetland plant communities that are dependent on the hydrology (both surface water and groundwater) and geomorphic processes of the river. In general, the riparian zone correlates with the river's active and historic floodplain. Within the river valley, riparian-wetlands also occur above the active floodplain on terraces where irrigation return flows provide enough water to artificially sustain wetland conditions. Return flows may also augment the hydrology of some riparian-wetlands that naturally occur within the river's riparian zone.

Between Flora Vista and the San Juan River confluence, the river becomes more sinuous and the valley broadens to 3,000 to 5,000 feet in width. Potentially, these conditions would favor a wider riparian zone, but because the broader valley is suitable for human occupation, riparian-wetlands are limited due to the construction of flood control measures (i.e., channel straightening, riprap emplacement, levees, etc.) and development within the floodplain.

In general, six types of riparian-wetland habitats occur within the Animas River valley; cottonwood, willow, Russian olive and/or tamarisk, grass/forb riparian, and emergent wetlands.

Cottonwood and willows generally occur as linear stands along the valley bottom. Mature stands of cottonwood usually occur on terraces located above the active floodplain. Cottonwood seedling recruitment happens infrequently because scouring flood flows remove new growth before it becomes well established and capable of withstanding flood flows. Willows and emergent wetlands usually occur along riverbanks, on islands, and in old meander scars. Russian olive and/or tamarisk also occur along riverbanks, but appear to be more common on terraces where irrigation returns provide ample water supplies. Grass/forb occurs within the river's riparian zone and in locations that are influenced by irrigation return flows. A more detailed and

quantitative description of these riparian-wetland habitats is provided in Appendix H of the 1996 FSFES.

5.3.4. Farmington to Shiprock Water Pipeline

The presence of riparian-wetlands along the Farmington to Shiprock water pipeline route is very limited and is confined to the riparian zone of the San Juan River and its tributaries. Riparian-wetlands are also associated with leakage from irrigation canals and drains used to capture return flows.

Typically, the riparian zone of the San Juan River is dominated by tamarisk and Russian olive. Small clumps of cottonwood and willow occur infrequently. Small patches of emergent wetlands dominated by cattails and bulrush, and wet meadows dominated by sedges, grasses, and rush, also occur within the river's riparian zone. Tamarisk, Russian olive, and willow are also frequently associated with irrigation canals and drains.

5.4 ENDANGERED SPECIES

Threatened or endangered species that occur or may occur in the project area are identified in Table 4. The southwestern willow flycatcher (*Empidonax traillii extimus*) is not likely to occur in Ridges Basin, but suitable habitat is available in the San Juan River corridor, and possibly the Animas River corridor. Bald eagles (*Haliaeetus leucocephalus)* are transient winter residents along the Animas River. Colorado pikeminnow[1] (*Ptychocheilus lucius)* and razorback sucker (*Xyrauchen texanus*) have been extirpated from the Animas River and occur in the San Juan River downstream of the confluence of the Animas River. The Mexican spotted owl (*Strix occidentalis lucida*) is known to occur regionally, but local surveys by the Service in April and May 1992, along Carbon Mountain failed to locate any birds. In 1999, CDOW initiated a program to re-establish viable populations of the Canada lynx (*Lynx canadensis*) in the Southern Rockies. Initial transplants were made in various locations within the San Juan Mountains. Although individuals have been located in the Durango vicinity, suitable habitat for this species does not occur on project lands. The peregrine falcon (*Falco peregrinus*) was recently removed from the endangered species list, but is still considered a sensitive species by the States of Colorado and New Mexico, as well as the Southern Ute Indian Tribe. The Service will continue to monitor population trends of this species for at least 5 years after delisting, as specified in section 4 of the ESA.

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[1]formerly Colorado squawfish

Table 4. Threatened or endangered species that occur or may occur in the project area.

Common Name	Scientific Name	Federal Status
southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered
bald eagle	*Haliaeetus leucocephalus*	Endangered
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered
razorback sucker	*Xyrauchen texanus*	Endangered
Mexican spotted owl	*Strix occidentalis lucida*	Threatened
Canada lynx	*Lynx canadensis*	Proposed
boreal toad	*Bufo boreas boreas*	Candidate
sleeping Ute milk-vetch	*Astragalus tortipes*	Candidate

6.0 FISH AND WILDLIFE RESOURCES WITH THE PROJECT

6.1 AQUATIC RESOURCES

The primary impact of the ALP on aquatic resources will result from diversion of flows from the Animas River at the Durango Pumping Plant. The impact of the project on flows of the Animas River is best illustrated with Site 1 (downstream of the Durango Pumping Plant) and Site 7 (upstream of Farmington at the confluence with the San Juan River). Maximum impact at Site 1 is expected to occur during average years, when flows would be decreased by as much as 48 percent during October (Figure 3); flows during wet years would be decreased by as much as 43 percent during October, and flows during dry years would be decreased by as much as 25 percent during April. At Site 7, flow of the Animas River would be expected to decrease by as much as 63 percent in October during average years; 57 percent in August during wet years; and 76 percent in August during dry years.

The presence and subsequent operation of the reservoir could have an indirect impact on fishes in the Animas River, San Juan River, or other rivers, depending on the method of water delivery from the reservoir. Potential impacts could include release of undesirable nonnative predatory or competitive fish, spread of whirling disease or other diseases or pathogens, and release of degraded water quality with high levels of heavy metals and/or selenium.

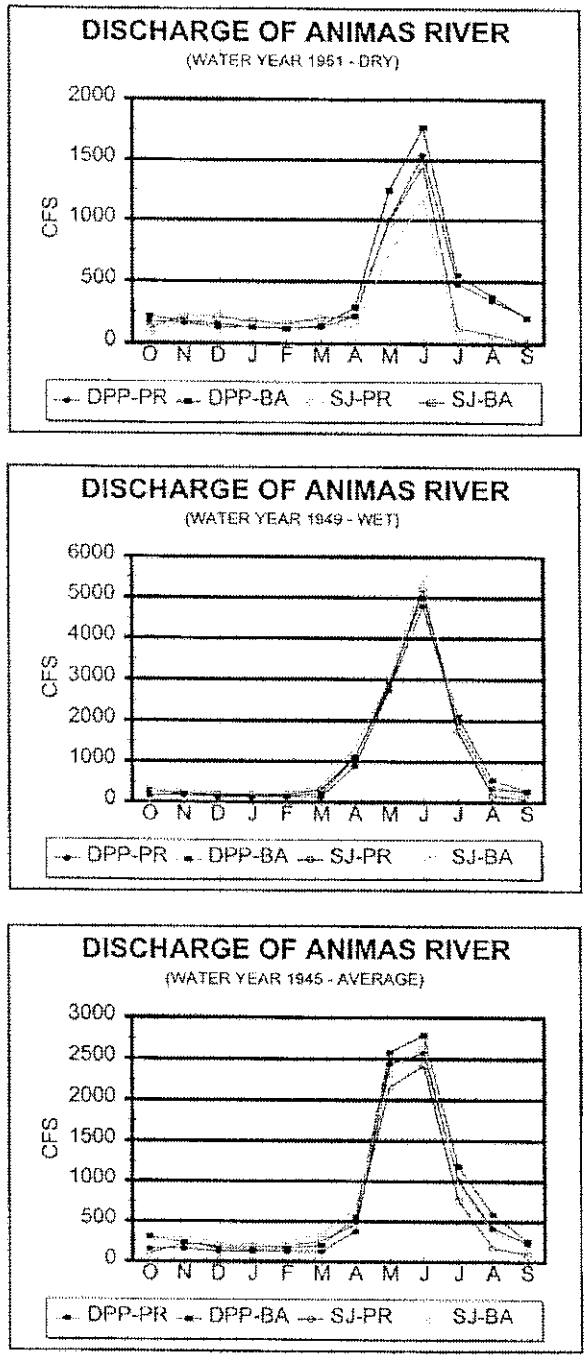

Figure 3. Discharge of the Animas River below the Durango Pumping Plant with (DPP-PR) and without (DPP-BA) the project and at the confluence of the San Juan River (SJ-PR, SJ-BA) for representative dry (1951), wet (1949), and average (1945) water years.

6.1.1 Durango Pumping Plant

6.1.1.1 Direct Impacts

The Durango Pumping Plant could impinge fish on the trash screens and entrain small fish in the pumps and the inlet conduit leading to the reservoir. Newly hatched larval native fishes (incubation time is 5-7 days), including flannelmouth suckers, bluehead suckers, speckled dace, and mottled sculpin, are 0.3-0.5 inches long and about 1/25 inch in diameter (Snyder and Muth 1990), and are particularly susceptible to entrainment because of their propensity to drift with currents and their relatively poor swimming ability. Newly hatched sac fry of rainbow trout, cutthroat trout, and brown trout are 0.4-0.8 inches long, and about 1/8 inch in diameter, and remain in the gravel substrate for about 30 days. Losses by impingement and entrainment could also be high for trout if proper precautions are not taken with pump intake and screen designs. The majority of young native fishes in the Animas River hatch in June and July, while trout fry emerge from gravels in May and June. Impacts to young trout could be greater than to native fishes at the Durango Pumping Plant since it is close to trout spawning sites and upstream of most native fish spawning areas.

Changes in withdrawal of water from the Animas River through the Durango Pumping Plant could impact young fish in shallow nursery habitats. Sudden increases in pumping can lead to rapid flow depletion of shallow habitats and shorelines which could strand fish. The greatest effect of pumping, will occur immediately downstream from the plant, but that effect will be ameliorated with distance downstream. At Site 1 (immediately downstream of pumping plant), a change in pumping of 100 cfs will result in a vertical stage change of about 0.2 feet, and a change in pumping of 50 cfs will result in a stage change of about 0.1 feet, with river flow of less than 1,000 cfs (Lyons 1994). At river flow greater than 1,500 cfs, a change of 100 cfs and 50 cfs will result in stage changes of about 0.1 and 0.05 feet, respectively.

6.1.1.2 Indirect Impacts

The Project will divert up to 280 cfs from the Animas River at the Durango Pumping Plant. These diversions may impact fish habitat quality, quantity, and availability, thereby potentially impacting fish populations. This flow depletion will lower river stage and reduce wetted perimeter, with the greatest effect during fall and winter when river flows are lowest. Based on an agreement between Reclamation and CDOW (see below), pumping would not deplete flows below 225 cfs during April-September, 160 cfs during October-November and 125 cfs during December-March. Maximum depth losses near the Durango Pumping Plant (Site 1) in representative wet, dry, and average years (Figure 4) are expected to be less than 27 percent, and wetted perimeter is expected to decrease by less than 15 percent. Depth losses 2 miles downstream of the Florida River (Site 3; Figure 5) are expected to be less than 20 percent and wetted perimeter is expected to decrease by less than 7 percent. Based on these cross-sections, loss of depth will reduce the availability and depth of pools used by resting fish, and could result

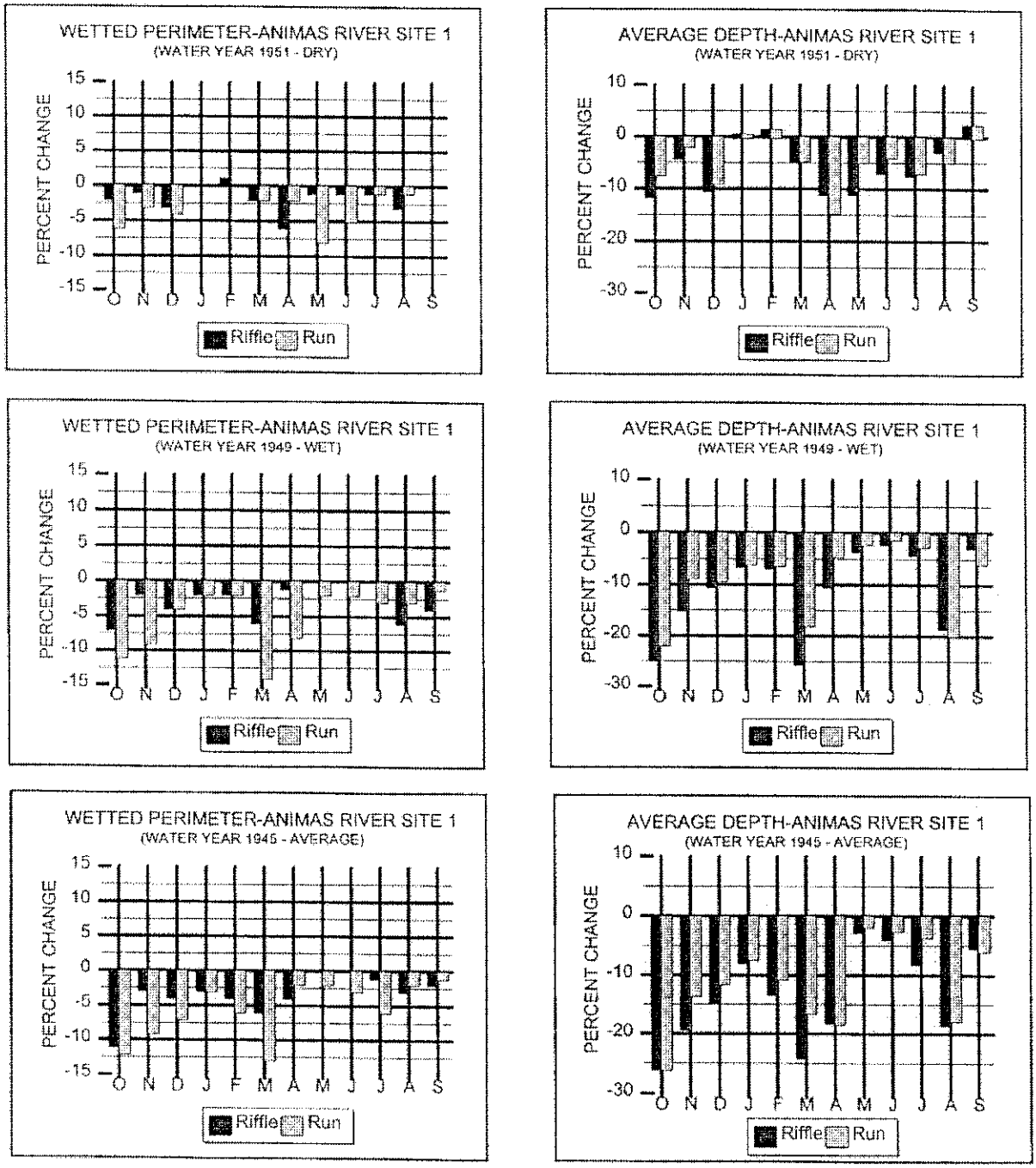

Figure 4. Percent changes in wetted perimeter and average depth of riffles and runs in cross sections at Site 1 of the Animas River (downstream of the Durango Pumping Plant). Hydrology analysis was for representative dry (1951), wet (1949), and average (1945) years.

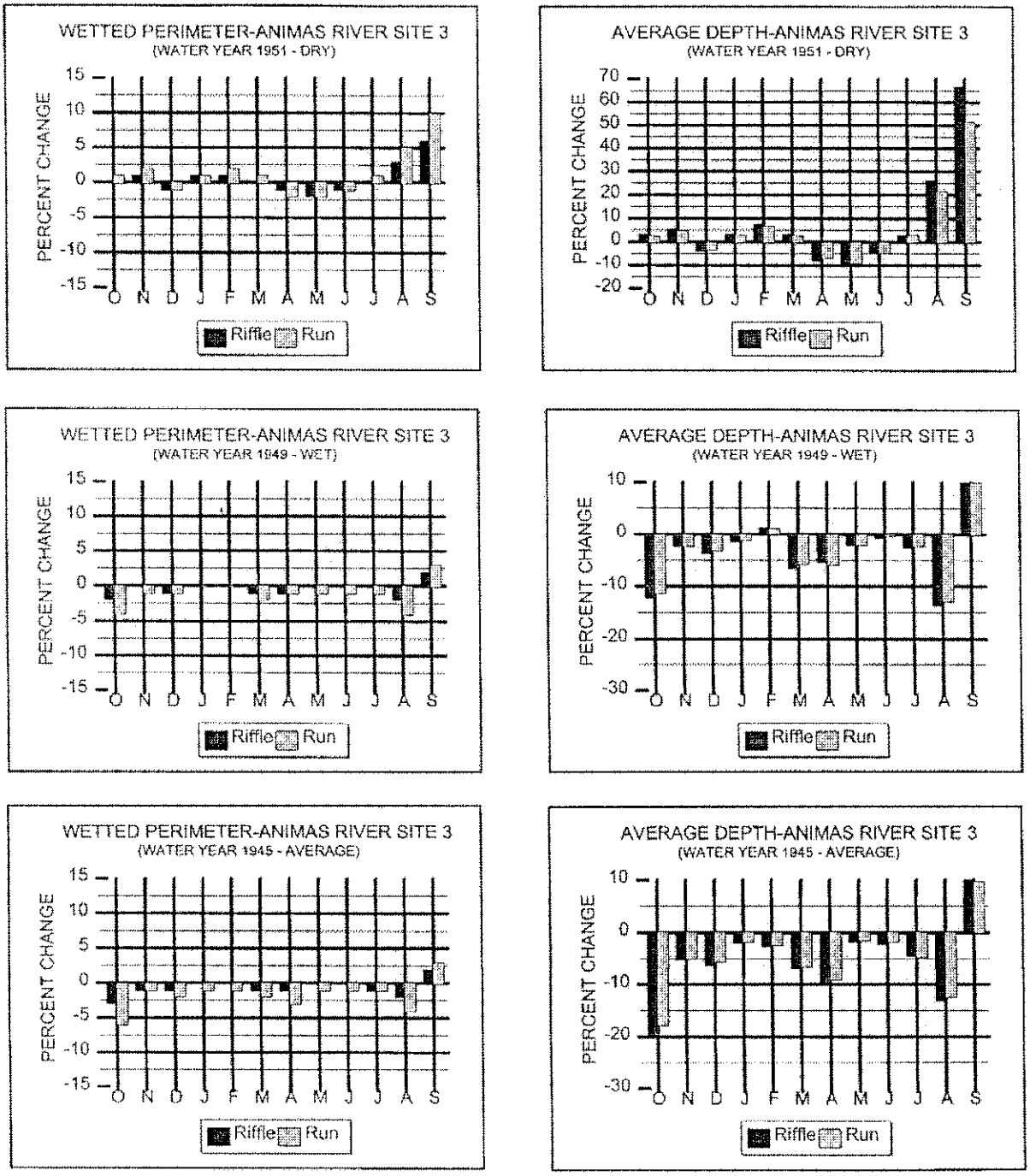

Figure 5. Percent changes in wetted perimeter and average depth of riffles and runs in cross sections at Site 3 of the Animas River (2 miles downstream of Florida River). Hydrology analysis was for representative dry (1951), wet (1949), and average (1945) years.

in crowding. Crowding will likely lead to stress, which may result in increased susceptibility to pathogens and diseases. This impact could be significant by reducing available space for adult trout and native fishes, but it is minimized since it will occur primarily during fall and winter when river flows and water temperatures are naturally low, and fish activity is reduced. Although average depth of runs and riffles will likely decrease, this loss of depth will effectively increase availability of shallow-water habitats used by small fishes. Reduction in wetted perimeter is not expected to significantly reduce overall fish habitat or negatively impact macroinvertebrate populations and food supplies of fish. Macroinvertebrate populations are robust in the Animas River and these quickly repopulate flow-depleted shoreline and riffle areas.

Although the Project will not affect the magnitude of low flows in the Animas River (i.e., pumping will not deplete flows below 225 cfs during April-September, 160 cfs during October-November and 125 cfs during December-March), the frequency of low flows is likely to increase as a result of pumping during fall and winter that could extend into late summer, especially during dry years. This chronic flow reduction will reduce pool habitat in summer that could reduce carrying capacity of trout in dry years and overall numbers that would survive over winter to the following year. Reduction in pool depth could also reduce habitat of native suckers, although flannelmouth suckers and bluehead suckers also use runs and riffles, which will continue to be available at low flows. Greater frequency of low flows could increase susceptibility of trout and native suckers to predation by avian predators, as well as prolong crowding stress. Prolonged crowding could lead to higher susceptibility to pathogens and disease.

Predicted maximum depth losses in riffles and runs at Site 7 (Aztec, New Mexico, to the confluence with the San Juan River) during the representative dry year (1951) are 51 percent and 44 percent, respectively (Figure 6). Wetted perimeter decreased by 30 percent and 36 percent for riffles and runs, respectively. This lower reach of the Animas River is highly degraded by irrigation diversions, channelization, and poor water quality from irrigation return flows. Fish populations are presently low and consist mostly of native suckers and nonnative minnows, with no trout present. Predicted flow depletion, depth losses, and decreases in wetted perimeter to this lower reach could significantly impact native fish populations by eliminating most suitable habitat during late fall and winter, and blocking fish movement. Water quality in this lower reach is also expected to be further degraded and could lead to an increased incidence of diseases and pathogens in fish. This chronic flow depletion could contribute cumulatively to further depressing native fish populations in this reach of the Animas River. Another potential impact of flow depletion in this reach is impediment to movement of young native fish from upstream reaches to lower reaches of the Animas River or to the San Juan River, and of subadults and adults from lower to upper reaches. It is not currently known if this movement occurs, and should be investigated as part of project monitoring. Movement of native fishes would be expected to occur in spring when existing flows are sufficiently high. Impediment to movement may be from existing low-head irrigation diversion structures.

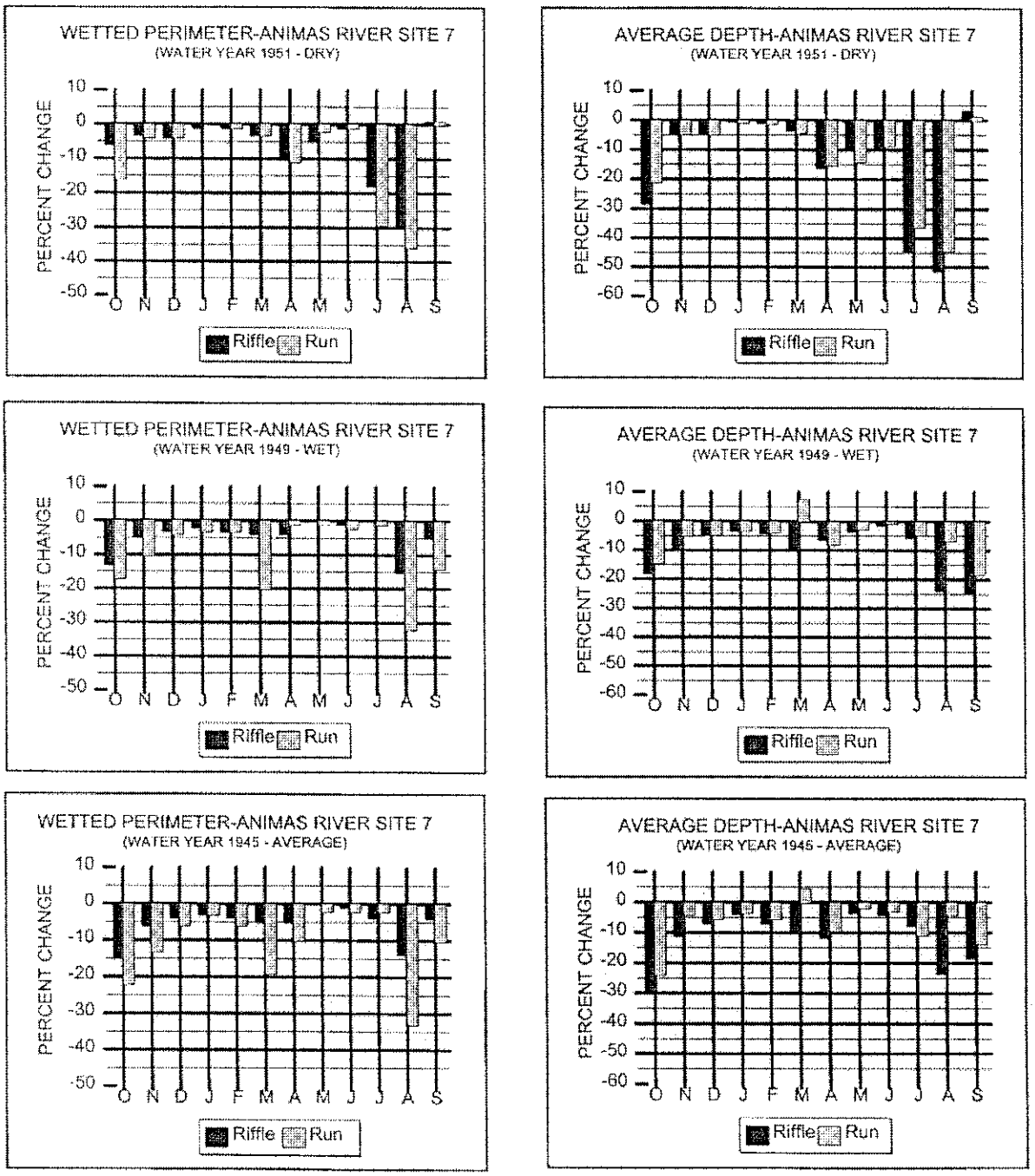

Figure 6. Percent changes in wetted perimeter and average depth of riffles and runs in cross sections at Site 7 of the Animas River (upstream of Farmington at the confluence with the San Juan River). Hydrology analysis was for representative dry (1951), wet (1949), and average (1945) years.

Decreases in flow and stage could impact game and native fishes, especially young, by reducing or rapidly altering shallow nursery areas. The greatest effect of pumping will be seen immediately downstream from the plant and that effect will be ameliorated with distance downstream.

In the 1980 ALP FES, Reclamation committed to two seasonal minimum bypass flows as measured at the Durango Pumping Plant. Flows of 225 cfs would be bypassed from April through September (summer), and flows of 125 cfs would be bypassed from October through March (winter); these minimum flows would be expected only during dry years. The CDOW stated that 125 cfs would not be sufficient to off-set project affects on the trout fishery, and requested bypass flows of 160 cfs in winter. A compromise was reached to increase bypass flows to 160 cfs during October and November for fall brown trout spawning, and to provide continued angling opportunities. Recently the CDOW has expressed concern over the 125 cfs as a low winter flow and possible detrimental impacts to trout. Flows of 160 cfs during October-November and 125 cfs during December-March are nearly the same as average minimum low flows, based on historic records from 1929-1989; i.e., 155 cfs during October-November and 118 cfs during December-March. Although bypass flows are established for the Animas River, the Durango Pumping Plant will effectively cause low flows to occur more frequently with the project. These low flows are most likely to occur in late summer, fall, and winter. Although most fish species in the Animas River are spring spawners with young that are capable swimmers by late summer, brown trout are fall spawners. More frequent low flows could desiccate redds and eggs and stress fry of brown trout.

Releases of 100 to 150 cfs have been predicted from the Ridges Basin Dam outlet works to provide M&I water to Durango, Farmington, and Shiprock. These releases would be made down Basin Creek primarily during the winter for an unknown duration, and could, in dry years, increase winter flows of the Animas River by 100 to 150 cfs.

6.1.2 Ridges Basin Inlet Conduit

6.1.2.1 Direct Impacts

The inlet conduit from the Animas River to Ridges Basin Reservoir is not expected to directly impact aquatic resources. The conduit leaves the pumping plant and crosses arid mixed vegetation lands without crossing any streams or surface waters.

6.1.2.2 Indirect Impacts

The Ridges Basin inlet conduit could indirectly impact the fishery of Ridges Basin Reservoir depending on the location of the inlet pipe to the reservoir. The present design is for water to spill from the conduit directly into a rock-lined channel, then into the reservoir. This surface location will allow for strong stratification of the reservoir, effectively reducing living space for fish. An inlet conduit deep in the reservoir could disrupt thermal stratification and increase

available fish habitat with suitable oxygen concentrations and water temperatures (see Section 6.1.3.2).

6.1.3 Ridges Basin Dam and Reservoir

6.1.3.1 Direct Impacts

Construction of Ridges Basin Dam is not expected to directly impact aquatic resources in either Basin Creek or the Animas River. Small amounts of sediment may wash into the Animas River, but the effect is expected to be insignificant, especially if best management practices for sediment control are implemented during construction.

6.1.3.2 Indirect Impacts

Nonnative warm and cool-water predaceous and competitive fish will likely become established in Ridges Basin Reservoir as a result of illegal transfers of fish. These fish could escape from the reservoir and negatively impact populations of native and endangered fishes in surrounding waters such as the San Juan River. The endangered Colorado pikeminnow and razorback sucker occur in the San Juan River downstream of the confluence of the Animas River.

Predicted conditions of Ridges Basin Reservoir indicate that the reservoir would be best suited for a cold-water trout fishery. Water temperature and dissolved oxygen concentrations are expected to be suitable to support trout species year-around, although the limnological condition of the reservoir will depend on a number of variables, including depth and location of the inlet conduit from the Animas River, depth and turnover time of water in the reservoir, and timing of reservoir fill and withdrawals. These variables will affect primarily the degree of thermal and chemical stratification (influenced by atmospheric temperature and wind), and the amount of primary production and resultant oxygen demands (P/R ratio). If oxygen in the hypolimnion of the reservoir (bottom layer during thermal stratification) remains sufficiently high, the reservoir may be able to support fish year-around.

The limnology of Ridges Basin Reservoir will also affect mobility and availability of metallic elements (e.g., mercury, cadmium, lead, zinc become mobilized under anaerobic conditions), and non-metallic elements (e.g., selenium is more available under aerobic conditions). Although these elements are present in the Animas River and may concentrate in reservoir sediments, the short residence time expected for rainbow trout (i.e., most are expected to live less than 1 year in the reservoir) is likely to be insufficient for bioaccumulation of these contaminants to levels that would pose a risk to human health and to other consumers in the ecosystem, such as birds of prey. Fish that survive more than 1 year have a greater potential for bioaccumulation that could pose risks to either human health or to birds and animal consumers. Bioassays of fish tissues from Farmington Reservoir in 1999 were inconclusive, but showed the potential for bioaccumulation of mercury, cadmium, zinc, and selenium in warm-water fishes and trout, using water from the Animas River.

Reservoirs of similar volume and elevation near the project area have low to moderate oxygen in the hypolimnion. Farmington Reservoir (7,600 acre-feet, 80 feet depth) had a thermocline at about 25 feet from the surface with dissolved oxygen concentrations of less than 3.0 mg/L in the hypolimnion on June 22, 1999. Vallecito Reservoir (125,400 acre-feet active capacity) had a thermocline at about 30 feet below the surface with dissolved oxygen concentrations greater than 7.0 mg/L. Based on data from these reservoirs, a 120,000 acre-feet Ridges Basin Reservoir is expected to stratify from about mid-June to mid-October with the thermocline establishing 25-30 feet below the surface with a dissolved oxygen concentration of 3.0-7.0 mg/L. The reservoir is likely to have an anaerobic hypolimnion (below the thermocline), a thermocline with low to moderate dissolved oxygen concentrations, and a warm but oxygenated epilimnion when the reservoir is stratified during summer. Aerobic conditions are likely to exist during spring and fall overturn, and during winter the reservoir is likely to have relatively low dissolved oxygen concentrations, depending on the timing and thickness of ice formation. As the reservoir is drawn down closer to the recreation pool of 30,000 acre-feet, the depth of the reservoir will decrease from about 200 feet at 120,000 acre-feet to about 70 feet at 30,000 acre-feet. This reduction in pool size will effectively constrict the thickness of all three limnion layers and reduce living space for fish. Oxygen levels in the thermocline could be as low as 3-5 mg/L. Trout become stressed at 4-5 ug/L dissolved oxygen and cannot survive at ≤3 ug/L at 16 °C or ≤1.89 ug/L at 10 °C (McKee and Wolf 1963). Nevertheless, this reservoir is expected to support a cold water fishery even during dry years when all water storage is depleted except for 30,000 acre-feet.

Selenium data from tables in a 1995 Service report (Finger 1995) are presented in Table 5. Applying a hazard quotient (HQ; Lemly 1995) Lemly (1996) determined that the Animas River has a low HQ of 0.28-1.0. Guidelines for interpreting HQ data are: HQ = <0.1, No Hazard Exists; HQ = 1.1-1.0, Hazard Is Low; HQ = 0.1-10, Hazard Is Moderate; and HQ = >10, Hazard Is High.

The report by Lemly (1996) suggests that the currently described project, which restricts water use from the Animas River, would present a low selenium hazard. However, the Lemly (1996) report also identifies a potential selenium problem if water from the La Plata or Mancos Rivers is used, particularly in an irrigation return mode. Changes or variations to the existing project will need to be re-evaluated with respect to the hazard potential for selenium.

Table 5. Concentrations of selenium in the Animas River (Finger 1995).

Element	Concentration)
Water	1-20 ug/L
Sediments	0.1-2.3 ug/g
Benthic Macroinvertebrates	1.8-2.9 ug/g
Fish	0.92-4.8 ug/g (3.0-15.8)[1]

[1]Selenium concentrations for fish were converted to equivalent egg concentrations (whole-body values x 3.3; given in parentheses) according to Lemly (1995).

6.1.4 Basin Creek Conveyance

6.1.4.1 Direct Impacts

Direct impacts of the Basin Creek conveyance to aquatic resources of Basin Creek are expected to be minimal. Few fish live in the creek, and include primarily speckled. Speckled dace are distributed throughout the region, and are adaptable to changes in habitat and able to survive in fragmented, flow depleted systems.

The open-channel system of conveyance through Basin Creek, as proposed by Reclamation, could impact fish populations in the Animas River. Scouring and incisement of the stream channel will result in downstream transport of sediment, some of which is likely to end up in the Animas River. Sediment in the Animas River could suffocate eggs and fry of trout, as well as eggs and larvae of native fishes.

Water released down Basin Creek will augment flows of the Animas River. Depending on timing and magnitude, these releases could substantially increase flows of the Animas River, particularly during late summer, fall, and winter, when the river is typically at base flow. This flow augmentation may improve fish habitat by deepening pools for resting fish, and runs and riffles for feeding during low flows.

6.1.4.2 Indirect Impacts

Releases of cold hypolimnetic water from Ridges Basin Reservoir could negatively impact fish in the Animas River if this cold water reaches the river. It is unknown if atmospheric warming of water flowing down Basin Creek will be sufficient for water temperature to approximately equal that of the Animas River. If the water from Basin Creek is colder than the Animas River by more than about 5 °C, it could cause thermal shock in young trout fry and larval native fishes immediately downstream of the inflow. Thermal shock can lead to disorientation of fish, greater susceptibility to predation, and possibly death. Thermal impacts would be greatest in late summer, when Animas River flows are low and water temperatures are high, such that flows

down Basin Creek (up to 250 cfs) would constitute a significant volume of the receiving waters. The distance from the outlet of Ridges Basin Dam down Basin Creek to the Animas River is about 3 miles. It is assumed that atmospheric warming of water flowing exposed down Basin Creek would be sufficient for water temperature to approximately equal that of the Animas River.

6.1.5 Farmington to Shiprock Pipeline

6.1.5.1 Direct Impacts

Construction of the Farmington to Shiprock Pipeline could impact fish populations in the San Juan River since the pipeline is expected to cross the river channel at two locations. If the pipeline is laid across the river in an open channel, downstream release of sediment could suffocate incubating eggs and young larvae of native and endangered fishes.

6.1.5.2 Indirect Impacts

The Farmington to Shiprock pipeline is not expected to indirectly impact aquatic resources. Once the pipeline is buried and in place, no actions are expected that could impact fish or other aquatic resources.

6.1.6 Relocation of Natural Gas Pipelines

6.1.6.1 Impacts

Relocation of natural gas pipelines from Ridges Basin is not expected to directly or indirectly impact existing aquatic resources if the relocation route is near Ridges Basin, and avoids water bodies or streams.

6.1.7 Relocation of County Road 211

6.1.7.1 Impacts

Relocation of CR 211 is not expected to directly or indirectly impact existing aquatic resources if the relocation route is near Ridges Basin and avoids water bodies or streams. Impacts to Wildcat Canyon Creek should be minimal if the bridge spans the entire stream channel and riparian area.

6.1.8 Land Based Recreation at Ridges Basin

6.1.8.1 Direct Impacts

Land-based recreation at Ridges Basin is not expected to directly impact existing aquatic resources.

6.1.8.2 Indirect Impacts

Land-based recreation at Ridges Basin is expected to indirectly impact aquatic resources. Recreational facilities will attract people to Ridges Basin Reservoir to fish. Also, as discussed in section 6.1.3.2, there is a high probability of illegal releases of fishes into the reservoir that could pose a threat to endangered fishes further downstream.

Development of boat ramps and boat docks for motorized boats can also lead to accidental release of gasoline and petroleum products into the water, as well as release of petroleum byproducts from operation of outboard motors. This could lead to a degradation of water quality in the reservoir that may impact aquatic life and fish. Petroleum products, for example, can kill zooplankton and benthic macroinvertebrates, which are the primary food sources of fish, and these products can also cause physiological maladies and diseases in fish.

6.2 TERRESTRIAL RESOURCES

6.2.1 Durango Pumping Plant

6.2.1.1 Impacts

Direct impacts of the pumping plant on terrestrial wildlife are expected to be minimal. The facility would be located across from Santa Rita Park, in an area that has been previously disturbed and is vegetated with native grasses. Approximately 15 acres will need to be cleared of vegetation for placement of the pump facility. Small animals may be displaced by construction of the pumping plant. Larger animals that use this area to forage will be impacted, but this impact should be insignificant.

6.2.2 Ridges Basin Inlet Conduit

6.2.2.1 Impacts

The construction phase of the inlet conduit from the pumping plant to Ridges Basin Reservoir is likely to impact wildlife, with the degree of impact depending on the timing of construction. Two redtail hawk nests are located at the northeast end of the proposed reservoir, and are in or near the path of the inlet conduit. Disturbance near the nest site may cause abandonment of the nest and nest failure. Big game animals using this area for disbursed migration, or daily movement could be impacted by human activity.

A portion of the proposed Ridges Basin inlet conduit will impact terrestrial resources and wildlife. The proposed rock channel, that will allow water to flow from the conduit to the reservoir will result in a loss of wildlife habitat. This impact may be insignificant due to the proximity of CR 211. The rock channel could cause animals to become trapped or injured by attempting to cross the channel. Sudden high flows in the channel, from an increase in pumping

rate, could trap and drown wildlife attempting to cross the channel. The structures could disrupt dispersed movement of larger species of wildlife.

There is expected to be a conversion of habitat type along the majority of the route, from pinyon-juniper/mountain shrub/sagebrush types to native grass/forb type in order to keep the corridor clear for inspection and maintenance.

6.2.3 Ridges Basin Dam and Reservoir

6.2.3.1 Direct Impacts

Blasting for construction of Ridges Basin Dam, hauling of overburden and construction materials to and from the site, may impact two golden eagle nests that are located on the west face of Carbon Mountain. Both of the nests are used alternately by the same pair of eagles. The nests could be shaken loose from the cliff where they are positioned, or could be knocked off the cliff by rock dislodged from above. Construction activities will impact other wildlife, particularly large game animals, by disrupting migration, calving and fawning. This impact will be temporary, but will likely persist for a number of years prior to completion of the dam.

Inundation of Ridges Basin with 120,000 acre-feet of water will impact an estimated 1,482 acres of wildlife habitat (CDOW mapping), composed mostly of sagebrush (34 percent), grass/forb (26 percent), mountain shrub mix (21 percent), and pinyon-juniper mix (15 percent), (Table 3). The basin is inhabited with many species of wildlife that use the basin for a variety of needs. An unquantifiable number of animals will be lost by filling the reservoir as well as their habitat. Lost habitats include big game winter range, den sites for prairie dogs, and foraging areas for nearly all terrestrial species. In addition, migration of big game will be disrupted by the presence of the reservoir, requiring animals to find other means by which to migrate to historic winter range, and calving and fawning areas that are available to the south of the basin.

6.2.3.2 Indirect Impacts

Dam construction could cause disruption of pre-nesting rituals, as well as abandonment of golden eagle nests on Carbon Mountain. Inundation of Ridges Basin will eliminate habitat for local populations of rodents (i.e., prairie dogs, ground squirrels, rabbits), and may deplete those populations locally due to a significant decrease in habitats. Birds of prey will be forced to find other territories in which to hunt and may increase competition within those areas. Loss or reduction of this prey base could result in abandonment of the golden eagle nests on Carbon Mountain.

Recreation on and around Ridges Basin Reservoir is expected to have significant impacts to wildlife and their habitats. Currently there is very little recreational use within Ridges Basin during most of the year. Reclamation has projected 218,000 user days at the reservoir site with the current proposal. This is a significant increase in human activity within the basin. Some

wildlife species will avoid areas that are being heavily used for recreation. Although impacts during the winter will be less severe, there is the likelihood of total abandonment by some species with continued disturbance in recreation areas (see section 6.2.7).

6.2.4 Farmington to Shiprock Pipeline

6.2.4.1 Impacts

The Farmington to Shiprock pipeline is expected to impact mostly terrestrial vegetation along the route, with some temporary impact to wetland riparian vegetation where it crosses rivers and other drainages. The majority of the pipeline route is vegetated with native grasses. Vegetation will be disturbed for a period of time to facilitate construction of the new pipeline. Wildlife using this area for foraging, or dening/nesting will be temporarily displaced during construction. Impacts to wildlife and their habitats are expected to be insignificant, with the exception of southwest willow flycatcher habitats. There are several locations along the pipeline route where there is potential habitat for resident as well as migrant southwest willow flycatchers. Willows, tamarisk, Russian olive, and possibly cottonwood trees, will likely be removed to facilitate placing the pipeline within the alignment. There is the potential to disturb nesting birds during construction as well as taking of nests when vegetation is removed. Removal of cottonwood trees will remove resting and roosting trees available to bald eagles. At this time, it is unknown whether these vegetative species will be allowed to revegetate the right-of-way. The right-of-way may need to be kept clear of larger, more deeply rooted plant species, to prevent damage to the pipeline and for maintenance and inspection.

6.2.5 Relocation of Natural Gas Pipelines

6.2.5.1 Impacts

Relocation of the pipelines will impact wildlife habitats. At this time, the right-of-way has not been selected and therefore, identification of habitat losses cannot be completed. Construction activities associated with the relocation of the pipelines will likely result in disturbance to wildlife species currently using the proposed right-of-way. Human activity will result in avoidance by larger species of wildlife during construction; however this disturbance will be temporary and will not result in abandonment of habitat. Vegetation disturbed by construction of the pipelines will be pinyon/juniper, sagebrush, shrubs, native grasses and ponderosa pine. The right-of-way will be kept clear for maintenance and inspection, and will result in the conversion of vegetation from what currently occurs within the right-of-way to native grasses. The 1996 FSES discussed a route that would pass over Carbon Mountain and would have required the taking of one or both of the golden eagle nests situated on the west face of the mountain. Taking of these nests would require a permit from the Service. However, such a permit is not likely to be issued, because there are practicable alternatives to the Carbon Mountain route.

6.2.6 Relocation of County Road 211

6.2.6.1 Direct Impacts

Relocation of CR 211 is expected to impact existing wildlife habitat, and could disrupt migration of big game. Construction during late fall, winter and spring could interfere with migration of deer and elk. Construction during this period could also disturb wintering wildlife and result in displacement of wildlife to less than desirable areas, or result in crowding on winter range. Crowding of winter range could result in physiological problems in some species, or could result in starvation due to lack of forage. The shoreline route would require 2.5 miles of new road to connect with the remaining east and west segments of CR 211, while the Rafter J route would require 3.1 miles of new road to connect CR 211 from the east with State Highway 141 in Wildcat Canyon. At a width of about 30 meters for the road corridor, the shoreline route will cause the loss of approximately 32 acres of wildlife habitat (CDOW mapping). The Rafter J route will cause the loss of approximately 38 acres of habitat (CDOW mapping). The Rafter J route is slightly different from the ridge-top route described in the 1996 FSFES. The ridge-top route described in 1996 followed CR 212 for a short distance, then turned west to follow the ridge eventually meeting with State Highway 141 northwest of the basin.

6.2.6.2 Indirect Impacts

Impacts of relocating CR 211 are not limited to the right-of-way. Big game species will avoid this corridor due to increases in traffic volume expected on this road. Elk and deer currently use this area as winter range and for calving/fawning in the spring. High recreational use during the summer, and increases in traffic volume on CR 211 year around, will likely result in a zone of general avoidance by big game species, effectively eliminating these areas as big game habitat. To determine the impact to wildlife habitats from the relocation of CR 211, avoidance zones were used for roadways and campgrounds as described by Ward et al. (1973) and Ward (1976). Based on studies of elk response to different forms of disturbance, avoidance zones of 0.25 miles on either side of roadways, was used in calculating disturbance-related habitat losses.

Using an avoidance corridor of 0.50 miles (Ward et al. 1973), the avoidance impact from the shoreline route is computed as 2.5 miles x 0.50 miles = 800 acres. For the Rafter J route, the avoidance impact is computed as 3.1 miles x 0.50 miles = 992 acres. A large increase in vehicular traffic may substantially expand this avoidance zone.

Smaller terrestrial wildlife will probably continue to use the area, however collisions with vehicles along CR 211 will likely become more frequent. Also, La Plata County is currently seeking an alternative route for automobile travel between State Highway 140 and 141 to south Durango. Projected traffic volume and use patterns indicate that eventually a paved 2-lane highway will be required for CR 211 (pers. comm., Mike Russell, La Plata County Planning Engineer). This impact could have significant effects especially on deer and elk herds using the Ridges Basin area as winter habitat.

6.2.7 Land Based Recreation at Ridges Basin

6.2.7.1 Direct Impacts

Land-based recreation proposed for Ridges Basin will impact existing terrestrial resources and wildlife. Assuming two thirds of the level of development from the 1996 DSFES, approximately 85 acres of wildlife habitat will be lost to recreation facilities proposed for the reservoir site. Wildlife habitat within the basin has been described in section 5.

6.2.7.2 Indirect Impacts

Assuming an avoidance zone of 0.5 miles around recreation sites, approximately 906 acres of wildlife habitat is expected to be lost due to avoidance around campgrounds (Ward et al. 1973, Ward 1976), parking lots and other facilities. Recreational developments are expected to create avoidance by most larger species of wildlife. Assuming that most recreation sites will be within 0.5 miles of each other, and due to topography and exposure, not all of the 906 acres will be used by big game. The following estimate is based on the assumption that land-based recreation is expected to be approximately two-thirds of the magnitude described in the 1996 FSFES and the 1993 FWCA Report (U.S. Fish and Wildlife Service 1993); 620 acres x 0.667 = 409 acres. Calculations of data are described in the 1993 FWCA Report.

6.2.8 Conclusions

Estimates of impacted wildlife habitats are 2,691-2,883 acres (Table 7). Approximately 2,700-2900 acres of wildlife habitat will be lost as a result of the Project. These estimates of impacted habitats are believed to be conservative. A variety of factors difficult to quantify will likely increase true impacts well beyond those calculated. Human activity will likely extend well beyond estimated disturbance areas, resulting in additional impacts to wildlife habitat and further avoidance by wildlife.

6.3 RIPARIAN-WETLANDS

6.3.1 Durango Pumping Plant

6.3.1.1 Direct Impacts

Construction of the intake structures for the Durango Pumping Plant would likely fill less than 0.1 acre of riparian-wetlands situated along the west bank of the Animas River. Construction of the building that houses the pumping apparatus is not expected to impact riparian-wetlands.

6.3.1.2 Indirect Impacts

Operation of the pumping plant will reduce surface flows in the Animas River; however, these flow reductions are expected to have minimal effects to the river's flood regime and to the depth-to-ground water within its flood plain. Therefore, flow-related impacts to existing riparian-wetlands are expected to be minimal. There could, however, be minor impacts to cottonwood recruitment between Flora Vista and the San Juan River confluence (Reclamation 1995c).

6.3.2 Ridges Basin Inlet Conduit

6.3.2.1 Impacts

Because the inlet conduit will be a buried pipeline, its construction should result in temporary impacts to less than 1 acre of riparian-wetlands. Implementation of best management practices during the construction of the inlet conduit would minimize indirect impacts to riparian-wetlands. Any indirect impacts that may occur should be temporary.

6.3.3 Ridges Basin Dam and Reservoir

6.3.3.1 Direct Impacts

Construction of Ridges Basin Dam and flooding of Ridges Basin will impact a total of 121 acres of riparian-wetlands. Of this total, approximately 72 acres are wet meadow, 25 acres are emergent channel, 21 acres of cattail marsh, and 3 acres of open water. Construction of ancillary facilities and access roads will probably result in a temporary impact to less than 1 acre of riparian-wetlands.

6.3.3.2 Indirect Impacts

Indirect impacts resulting from the construction of the dam and appurtenant facilities should be minimal assuming best management practices are properly implemented. Any indirect impacts that may occur during construction should be temporary.

The drainage area of the Basin Creek watershed upstream of the proposed dam site is approximately 6 square miles. According to Reclamation's hydrological analysis, which is based on flow measurements taken near the dam site in 1993 (see Appendix A of the 1996 FSFES), annual flow recorded at the dam site was approximately 2,900 acre-feet of water. Mean daily stream flows ranged from 0 to about 62 cfs. Capture of these flows in the reservoir will significantly reduce sources of surface water and groundwater that are presently supporting riparian-wetlands downstream of the dam, and may result in the loss of riparian-wetlands along Basin Creek.

6.3.4 Basin Creek Conveyance

6.3.4.1 Impacts

Reservoir releases into Basin Creek greater than 100 cfs could result in channel and floodplain scouring that, in turn, could cause significant impacts to riparian-wetlands located downstream of the dam site. Estimated releases of up to 250 cfs are expected for satisfying project demands. The estimated area of wetlands that could be impacted in Basin Creek is 13 acres.

6.3.5 Farmington to Shiprock Water Pipeline

6.3.5.1 Impacts

The water pipeline will be buried, and its construction should result in temporary impacts to riparian-wetlands. The impacts would be limited to two crossings of the San Juan River, which should have minimal effects to riparian-wetlands, assuming best management practices are implemented. Most tributary crossings are associated with intermittent stream channels, or arroyos that support minimal or no riparian-wetlands. Temporary impacts to riparian-wetlands associated with canal leakage and irrigation drains should recover quickly with proper reclamation of the right-of-way.

6.3.6 Relocation of Natural Gas Pipelines

6.3.6.1 Impacts

At this time, a specific route for relocation of the natural gas pipelines has not been identified, although it is likely that any selected route will cross the Animas River and other tributary drainages. Because the pipeline will be buried, it is assumed that any crossings of riparian-wetlands would only result in the temporary loss of riparian-wetland vegetation, assuming proper revegetation practices are implemented. It is also assumed that disturbance to major riparian areas along the Animas River would be greatly minimized with the use of directional boring.

6.3.7 Relocation of County Road 211

6.3.7.1 Impacts

At this time, a definite route for the relocation of CR 211 has not been identified. Construction of either the shoreline or Rafter J routes may result in minimal impacts to riparian-wetlands associated with tributary drainages of Basin Creek. Construction of the Rafter J route may also result in impacts to riparian-wetlands associated with the crossing of Wildcat Creek to tie into State Highway 141.

6.3.8 Land Based Recreation at Ridges Basin

6.3.8.1 Impacts

Except for water-dependent facilities, it is assumed that all land based recreation will avoid impacts to riparian-wetlands. Construction of water-dependent facilities (i.e., marina, boat launches, etc.), could result in losses of shoreline habitat that may develop prior to construction of these facilities. Depending on the location and timing of construction of the facilities, an undetermined quantity of riparian-wetland habitats may be impacted on the shoreline.

6.4 ENDANGERED SPECIES

Endangered species issues will be described in the biological assessment and the biological opinion.

7.0 DISCUSSION/MITIGATION/ENHANCEMENT

7.1 MITIGATION POLICY

The mission of the Fish and Wildlife Service is to work with others to conserve, protect and enhance fish, wildlife, and plants, and their habitats for the continuing benefit of the American people. The goal is to conserve, protect and enhance fish and wildlife and their habitat and facilitate balanced development of this nation's natural resources by timely and effective provision of fish and wildlife information and recommendations. Fish and wildlife and their habitats are public resources with clear commercial, recreational, social, and ecological value to the Nation. In the interest of serving the public, it is the policy of the Fish and Wildlife Service to seek to mitigate losses of fish, wildlife, their habitats, and uses thereof from land and water developments.

The FWCA directs the action agency to consult with the Service for purposes of "preventing loss of and damage to wildlife resources." It further directs the Federal action agency to give wildlife conservation measures equal consideration to features of water resource development. Consideration is to be given to all wildlife, not simply those which are legally protected under the Endangered Species Act or those with high economic and recreational value. Further, the recommendations of the Service and the state wildlife agencies which follow are to be given full consideration by the action agency. All aspects of the Project should be designed and constructed to avoid and minimize impacts to wildlife resources. Mitigation recommendations set forth in this report have been guided by the Service's Mitigation Policy.

Very little is known about the baseline condition of many of the resources that will be impacted by this project, therefore, pre-project monitoring should commence as soon as possible to either establish a baseline, or improve current databases of resources and their current condition. While

the reservoir is being filled, impacts to aquatic resources, and riparian-wetland areas, along the Animas River, should be monitored to determine the magnitude of the impacts resulting from reduction in flows. Once mitigation measures have been implemented, monitoring programs must be established to evaluate their effectiveness. Where monitoring reveals that mitigation is ineffective or deficient, measures must be adjusted so that full compensation is attained. Mitigation of impacts should not be considered complete until those measures have been evaluated to ensure full compensation of resources impacted by the Project. Mitigation must be implemented in advance of, or at a minimum, concurrent with impacts to resources.

Impacts to trout and native fishes in the Animas River should be mitigated in cooperation with the CDOW, NMDGF, and SUIT. Mitigation for trout should be based on a more reliable source of fish for stocking. Currently, the number of available hatcheries supplying trout is limited due to demands for other projects. Reclamation may need to acquire a hatchery to provide the source of fish necessary to accomplish mitigation. Mitigation opportunities on the Animas River are limited do to cumulative degradation of fish habitat resulting from flow depletions. Physical channel modifications, such as fish habitat structures (e.g., rock weirs, rock barbs, log structures, etc.) to enhance habitat, are not practical on the Animas River because of the spurious seasonal flows and the broad rocky channel (pers. comm., Richard Valdez, SWCA, Inc.). Mitigation for native fish should be accomplished through securing off-site habitat for native fish populations within the San Juan Basin. Cumulative project impacts could be mitigated by reducing entrainment of drifting larvae in irrigation diversions, and by increasing fish passage on the Animas River at the numerous diversions.

Losses of wildlife habitat should be mitigated, in coordination with the Service, CDOW, and the NMDGF, to replace habitat functions and values impacted by the Project. Mitigation lands must be acquired and managed to the benefit of wildlife. Operational and maintenance funds should be made available by Reclamation to maintain mitigation measures in perpetuity. Without operation and maintenance funding for mitigation lands, mitigation measures will not be maintained and the value to wildlife will deteriorate. Mitigation measures must include both direct and indirect impacts to wildlife habitat. Identification of appropriate mitigation sites will be based on availability, and the use of GIS database information supplied by CDOW to ensure suitability of mitigation lands.

Reclamation must also take into account Indian hunting rights when selecting mitigation lands. Because wildlife habitat losses are occurring within the treaty area defined in 1874 under the Brunot cession, mitigation that may occur outside of this treaty area should address reserved tribal hunting rights.

Mitigation for unavoidable impacts to riparian-wetlands should be based on replacement of in-kind habitat type and ecological functions. A comprehensive monitoring plan should be implemented to verify the extent and severity of anticipated impacts. Pre-project monitoring will establish a baseline for which Project impacts can be compared. Mitigation measures must be monitored to ensure that all impacts are adequately mitigated. Measures that are found to be

deficient or inadequate should be adjusted based on monitoring results. Guidelines for wetland mitigation have been developed by the Service and are presented in Table 6.

Table 6. Ratios for mitigation of vegetative types (recommended, minimum requirement).

Level	Ratio	Habitat Type
Advance Creation	1.5:1	forested, scrub-shrub
	1:1	emergent
Concurrent Creation	2:1	forested, scrub-shrub
	1.5:1	emergent
Advance Restoration	1.5:1	forested, scrub-shrub
	1:1	emergent
Concurrent Restoration	2:1	forested, scrub-shrub
	1.5:1	emergent
Advance Enhancement	3:1	forested, scrub-shrub
	2:1	emergent
Concurrent Enhancement	4:1	forested, scrub-shrub
	3:1	emergent

7.2 AQUATIC RESOURCES

7.2.1 Mitigation

The degree of impingement and entrainment of young fish by the pumping plant cannot be determined at this time. Design of the pumping plant should incorporate features such as baffles, deflectors, grates, and screens, to minimize this impact on fish. Monitoring of the pump intakes as well as the water delivery system should be performed to evaluate the extent of impact to young fish, and modify the structure, if necessary, to further minimize that impact.

Mitigation for trout should be based on a more reliable source of rainbow trout and Snake River cutthroat trout to maintain the Gold Medal fishery in the Animas River. Some brown trout reproduction occurs but is likely inadequate to maintain the population.

Opportunities to mitigate loss of fish habitat on the Animas River are limited, but providing passage past irrigation diversions may ameliorate cumulative impacts and provide benefits to native fish populations in the lower river. Low head irrigation diversions in the lower Animas

River divert substantial flows into irrigation canals, possibly diverting large numbers of young fish drifting downstream during spring, and possibly blocking upstream movement of juveniles and adults. Impacts of diversion structures to native fish populations are not thoroughly understood, and drift of larvae past these structures during spring as well as upstream movement of juveniles and adults during summer and fall should be evaluated to determine if these potential barriers should be modified.

Because the potential impacts of pumping 90,000 acre-feet/year from the Animas River cannot be quantified for native fishes, and because full mitigation opportunities are not available on-site, the most viable mitigation for native fishes is conservation and enhancement of native populations in other tributaries of the San Juan River Basin. Populations of flannelmouth suckers, bluehead suckers, roundtail chub, and speckled dace occur in the La Plata, Mancos, and Florida Rivers. Mitigation opportunities in the La Plata River have been evaluated (Bio/West 1997) and are considered excellent for roundtail chub and flannelmouth suckers. Acquisition of properties along the La Plata River is recommended to protect the stream. Fish habitat can be improved by appropriate livestock grazing management and minor habitat reconstruction. Also, the native fish population of the La Plata River can be greatly conserved, enhanced, and possibly expanded by securing an additional water source for mitigation purposes. Additional flows of approximately 5 cfs from July to March would sustain fish habitat during the irrigation season and low winter periods.

Decreases in flow and stage could impact game and native fishes, especially young, by reducing or rapidly altering shallow nursery areas. To minimize stranding of fish due to the operation of the pumping plant, changes in the pumping should be staged in the following manner: An increase in pumping should not exceed 50 cfs/hr (river stage decrease) and a decrease in pumping should not exceed 100 cfs/hr (river stage increase) when natural river flows are above 500 cfs (i.e., 50 cfs/hr = 10 percent and 100 cfs/hr = 20 percent of 500 cfs). At lower flow, these ramping rates could substantially change river stage. Therefore, when river flow is at or below 500 cfs, increases in pumping should not exceed 25 cfs/hr and decreases in pumping should not exceed 50 cfs/hr (i.e., 25 cfs/hr = 10 percent and 50 cfs/hr = 20 percent) of expected normal low river flow of 250 cfs. The greatest effect of pumping will be seen immediately down stream from the plant and that effect will be ameliorated with distance downstream.

Procurement of habitat and protection of flows in the La Plata River provides an excellent opportunity for enhancement of habitat for native fishes in the San Juan River Basin. Supplementing flows of the La Plata River with approximately 5 cfs during periods of low summer flow (from irrigation withdrawal) could increase and expand populations of flannelmouth suckers, bluehead suckers, and roundtail chub. These are species that are critically declining throughout their entire historic range within the Colorado River Basin, and there is a need to protect habitats and flows, to prevent these species from becoming listed under the Endangered Species Act.

The trout fishery in the Animas River within the Southern Ute Indian Reservation must be maintained and enhanced with a more reliable source of stocked rainbow trout and Snake River cutthroat trout. Since Federal hatcheries have revised their missions recently, a tribal-controlled and managed hatchery is appropriate for mitigation and enhancement. Construction of a new hatchery, or acquisition of an existing hatchery, for production of rainbow trout and Snake River cutthroat trout for stocking in the Animas River, is recommended as mitigation for loss of habitat from the Project.

To ensure the continued existence of the quality "Gold Medal" trout fishery outside of the Reservation, Reclamation should, in cooperation with CDOW, conduct pre-project monitoring of this fishery to establish a baseline database. During project operation, monitoring should continue to determine extent of project impacts to this fishery. If additional impacts are detected, Reclamation must pursue appropriate mitigation measures that will allow CDOW to maintain the gold medal designation of this fishery.

Reclamation should initiate a cold water fishery within the waters of Ridges Basin Reservoir, by providing hatchery reared trout. If this action is not taken by Reclamation, there is a high likelihood of unauthorized stocking of undesirable fish. Unauthorized stocking of predatory fish will likely exacerbate the escapement issue. Illegal stocking is likely to occur; however, providing fish in the reservoir may limit incidence of illegally released fish in the reservoir.

7.2.3 Unavoidable Losses

So little is known of the relationships between fish habitat and flow in the Animas River and its effects on fish populations that long-term effects to native fish populations cannot be determined at this time. The native fishes in this system are long-lived with variable annual recruitment, making assessment of population status and trends difficult. A monitoring program focused at determining the age structure of the sucker populations is recommended, as well as a program to determine the cause for an apparent lack of recruitment of suckers in the Animas River. Effects of white suckers and their hybridization with native suckers also needs to be evaluated, as well as the potential for screening irrigation canals and removing of fish barriers in the Animas River.

7.3 TERRESTRIAL RESOURCES

Creation of Ridges Basin Reservoir, will provide several positive benefits by creating some habitat for aquatic, semi-aquatic, and shore species, and through development of a cold-water fishery. It will likely attract some waterfowl, wading birds, and shorebirds. Shallow areas may provide breeding opportunities for amphibians where emergent vegetation establishes. There is some potential for attraction of bald eagles and ospreys; both occur in the area. Overall wildlife benefits may, however, be minimized by the level of recreation activity at the reservoir unless restricted. The water level in the reservoir may fluctuate substantially, inhibiting establishment and development of shoreline and littoral vegetation. Habitat, for species requiring emergent

vegetation, will likely be limited to areas at the upper end where the water table can be sustained for a period sufficient to establish sedge, rush, and cattails.

Construction activities associated with this project must be completed in a manner so as to limit disturbances to wildlife. Construction of the inlet conduit should not occur during raptor nesting activities in the spring, and should be avoided between November 15-May 1 to minimize disruption of deer and elk migration, wintering wildlife, and calving /fawning of these species. Conveyance of water to the basin should be through a pipeline, to reduce potential loss of wildlife due to stranding and drowning within the proposed rock channel. Construction of the dam is likely to create significant disturbances, many of which will be unavoidable. Measures should be taken to minimize noise levels, traffic volume, and any other activity that will create additional impacts to wildlife.

Abandonment of the golden eagle nests on Carbon Mountain is highly likely. Reclamation must apply for a permit for potential "take" of these nests in the event that they are lost due to construction activities. If one or both nests are "taken", appropriate mitigation measures must be pursued, which could include the installation of an artificial nesting structures in the vicinity of Ridges Basin.

Construction of, and the associated impacts resulting from the Farmington to Shiprock pipeline can be avoided by the construction of a water treatment facility at or near the Town of Shiprock, New Mexico. This would minimize a number of impacts created by this project. If this mitigation measure is found not to be feasible, then impacts to riparian areas along the San Juan River must be avoided or minimized along the corridor. Construction activities must avoid potential impacts to transient migratory birds that may be temporarily using the habitat.

Construction resulting from the relocation of the natural gas pipelines should be avoided from November 15-May 1, to avoid impacts to wintering big game animals and their migration to and from wintering areas.

Impacts of inundating Ridges Basin should be mitigated to offset the loss of wildlife habitat values by acquiring, protecting and enhancing property to the benefit of wildlife. Mitigation must include operation and maintenance funding to ensure that benefits are perpetuated over the life of the project. The total area of wildlife habitats (excluding wetlands) impacted from development of the ALP is show in Table 7. Property equal to approximately 2,700-2900 acres of equivalent wildlife habitat must be identified and enhanced to offset losses resulting from Project impacts. Mitigation property must be enhanced to provide for maximum carrying capacity to adequately mitigate for habitat loss. Mitigation of project impacts must replace the functions and values of that habitat that has been impacted. Property may be available near Ridges Basin or on the La Plata River (see section 7.2.1). Mitigation opportunities in the La Plata River have been evaluated (Bio/West 1997) and are considered good for big game and other terrestrial wildlife. Acquisition and enhancement of properties along the La Plata River are recommended as mitigation for wildlife habitats.

Priority should be given to acquiring property to the west of Ridges Basin Reservoir to protect wintering habitat and migration corridors for deer and elk. Property surrounding the reservoir should be dedicated to the protection of wildlife and their habitats. Acquisition of property west of the reservoir will also provide the opportunity for primitive dispersed recreation, i.e., hunting and wildlife viewing along the west and south shorelines of the reservoir. Failure to protect the south and west shorelines and the adjacent habitat for the benefit of wildlife will likely result in an increase in impacts to wildlife.

Purchase of property along the La Plata River would help to mitigate wildlife values by protecting wildlife habitat including wintering areas for big game. Deer and elk currently winter along the La Plata River, but extensive livestock grazing and lease hunting reduce the value of that property for wintering animals. Measures should be implemented to adjust current management practices on mitigation lands to improve habitat value.

Ridges Basin Reservoir recreational facilities should be kept at a minimum level. Recreational facilities should be restricted to the north shore of the reservoir. Facilities should be kept at the minimal development level to minimize human disturbance to wildlife, particularly overwintering big game, calving/fawning areas and during migration periods. Restrictions must be incorporated into the Resource Management Plan to preclude, in perpetuity, additional development of project lands within Ridges Basin. Failure to prohibit further development will add impacts to wildlife and their habitats. Recreational facilities should be limited to 10 miles of hiking trails, 100 camping units, 25 picnic units, 1 group picnic unit, public restrooms, a 4-lane boat ramp, and two parking areas with 100 stalls each. Recreational facilities should be closed from November 15-May 1, in order to protect winter use by big game, and to prevent disturbance during critical periods. Trails within the basin should be restricted to foot traffic only. Wildlife-related activities are strongly encouraged for Ridges Basin, including hiking, fishing, hunting, and wildlife viewing. Mechanized vehicles must be prohibited on the trail system to prevent destruction of habitats.

Re-route CR 211 to State Highway 141 near Wildcat Canyon. The Rafter J route is recommended for relocation of CR 211. This route would require 3.1 miles of new road to connect CR 211 from the east with State Highway 141 near Wildcat Canyon. This route is preferred primarily because it allows for discontinuation of CR 211 for about 2.5 miles to the northwest of the reservoir, and provides an undisturbed buffer zone for migrating big game moving along the northwest and west shore of the reservoir, which has been documented by CDOW as a primary migration corridor for deer and elk. The portion of CR 211 that will be abandoned must be obliterated, recontoured and planted with native vegetation. Access to the reservoir from the west must be prohibited in order to maintain the big game migration corridor that crosses the basin. Road construction should be avoided from November 15- May 1 to minimize disturbance to wintering wildlife.

Secondary road access in the area of Ridges Basin should be limited to public access to recreation areas, and administrative access for servicing facilities, such as Ridges Basin Dam,

Bodo State Wildlife Area, and electrical transmission line inspection and maintenance roads. Snowmobile and off highway vehicle use in this area must be prohibited year around to prevent disturbance to habitat and the wildlife that use the area during critical periods.

Table 7. Estimated impacts to wildlife habitat resulting from the project.

Component	Wildlife Habitat (acres)
Durango Pumping Plant	15
Ridges Basin Inlet Conduit	? (conversion)
Ridges Basin Dam & Reservoir	1,482
Relocate Natural Gas Pipelines	? (conversion)
Relocation CR 211	800-992
Recreation Areas	409
Totals	2691-2883

7.4 RIPARIAN-WETLANDS

Ideally, the 121 acres of wetlands that will be lost at Ridges Basin should be mitigated in-kind and in close proximity to the site of impact. On-site and nearby mitigation for these impacts may not be available. However, excellent riparian-wetland mitigation opportunities have been identified within the La Plata River valley (BIO/WEST, 1997). The acquisition and use of properties in the La Plata River valley for riparian-wetland mitigation could greatly improve habitat values for native fish and wildlife.

Mitigation for the <0.1 acre of riparian-wetland that would be directly impacted by the construction of the intake structures for the Durango Pumping Plant should occur along the Animas River in close proximity to the site of disturbance.

Direct impacts to riparian-wetlands resulting from the release of Project water into Basin Creek should be mitigated downstream of the dam site if possible, or along the Animas River near the creek's confluence. If no suitable sites are available, mitigation should occur within the La Plata River valley in association with mitigation for the Ridges Basin riparian-wetlands.

Direct impacts resulting from the construction of the Shiprock to Farmington water pipeline and the relocation of the natural gas pipeline should not result in the long-term loss of riparian-wetland habitats assuming proper revegetation practices are implemented.

The relocation of CR 211 and the construction of land-based recreation facilities at Ridges Basin may result in minimal impacts to riparian-wetlands. Because the extent of these impacts are expected to be very small, mitigation in close proximity to the site of impact should be possible.

Indirect impacts resulting from the construction of all Project components should be both minimal and temporary assuming best management practices are properly implemented.

Reduced flows in the Animas River resulting from the operation of the Project should not result in a significant loss of riparian-wetland habitats. Flow-related impacts are most likely to occur along the river's sensitive areas between Flora Vista and the San Juan River confluence. A long-term monitoring program should be implemented to verify the extent and severity of indirect impacts that may result from reduced flows in the Animas River. Any flow-related impacts (i.e., loss of riparian-wetland habitat and/or reduction in cottonwood recruitment) that are determined to be caused by the Project should be mitigated along the Animas River.

Flow reductions downstream of Ridges Basin Dam may impact riparian-wetlands situated along Basin Creek. The extent of impacts may be significant depending on method and timing of conveyance. A flow regime resembling the natural hydrograph of the creek should be released from the dam as a measure to maintain existing riparian-wetland habitats. The effectiveness of the maintenance flows should be monitored and adjusted accordingly.

7.5 ENDANGERED SPECIES

Endangered species issues will be described in the biological assessment and the biological opinion.

8.0 RECOMMENDATIONS

The following are recommended actions designed to evaluate, monitor, and mitigate impacts. Where possible, mitigation for fisheries, wildlife, and riparian-wetland resources should be consolidated by Reclamation seeking opportunities to acquire lands that are capable of mitigating more than one resource. This will provide an ecological benefit to all associated resources. Acquiring one or few off-site properties may be the most expedient and ecologically beneficial means to provide the greatest mitigation benefit possible.

8.1 AQUATIC RESOURCES

1. Minimize impingement and entrainment of fish at the Durango Pumping Plant. All reasonable measures should be taken to minimize impingement (fish trapped against grates, screens, or pump infrastructure) and entrainment (fish drawn into the pump and inlet conduit) of fish at the Durango Pumping Plant.

2. Gradually change volume through the Durango Pumping Plant. An increase in pumping should not exceed 50 cfs/hr (river stage decrease) and a decrease in pumping should not exceed 100 cfs/hr (river stage increase) when natural river flows are above 500 cfs (i.e., 50 cfs/hr = 10 percent and 100 cfs/hr = 20 percent of 500 cfs). When river flow is at or below 500 cfs, increases in pumping should not exceed 25 cfs/hr and decreases in pumping should not exceed 50 cfs/hr (i.e., 25 cfs/hr = 10 percent and 50 cfs/hr = 20 percent) of expected normal low river flow of 250 cfs.

3. Place inlet conduit below the 6,852 foot reservoir elevation. Ridges Basin Reservoir is expected to be about 200 feet deep at full storage of 120,000 acre-feet, and about 70 feet deep at a minimum recreational pool of 30,000 acre-feet. At most storage levels, the reservoir is expected to stratify from about June through September with the top of the thermocline located 25-30 feet below the surface, at a thickness of 12-15 feet. Because the water in the lower thermocline and in the hypolimnion is likely to have dissolved oxygen concentrations below the required minimum for trout of 5 mg/L, it is recommended that the inlet conduit for water from the Animas River enter the reservoir below the elevation where the thermocline is likely to establish. With a dam crest elevation of 6,892 feet, the water inlet conduit should enter the reservoir below about 6,852 feet elevation. The inflow of river water into this region would disrupt the thermocline and mix cooler hypolimnetic water with oxygenated epilimnetic water and river water, and provide greater living space for trout.

4. Monitor water quality of Ridges Basin Reservoir. Reclamation should implement an annual water quality monitoring program of Ridges Basin Reservoir to track concentrations of heavy metals, non-metallics (i.e., selenium), and nutrients. If any element within these parameters begins to concentrate to levels considered toxic to fisheries or wildlife, water should be pumped into the reservoir at a rate and/or frequency that will allow for complete turnover of water in the reservoir about every 3 years. Ridges Basin Reservoir will likely be filled prior to construction of a water delivery system from the reservoir. Evaporative losses are expected to be 2-3 percent of reservoir volume, and will be replaced by pumping water from the Animas River. Modeling of limnological parameters shows no significant accumulation of heavy metals, non-metallics or nutrients over a 3-5 year period following initial filling. Basic water quality parameters,i.e., temperature, dissolved oxygen, pH, conductivity; as well as nutrient levels (nitrogen and phosphorous), heavy metals and selenium should also be monitored in the Animas River immediately above and below the Durango Pumping Plant. The monitoring should also occur below Basin Creek to evaluate impacts of the project on water quality of the Animas River.

5. Establish a cold water trout fishery in Ridges Basin Reservoir. A cold water trout fishery is recommended for Ridges Basin Reservoir for two principal reasons: (1) a cold-water trout fishery, such as hatchery-reared rainbow trout, would not pose a threat to native and endangered fishes in the Animas or San Juan Rivers if fish escaped from the reservoir, and (2) water temperatures and reservoir limnology are predicted to be suitable for a cold-water trout fishery. Stocking of Ridges Basin Reservoir should be funded by Reclamation and must continue for the

life of the project. A reliable source of fish for Ridges Basin Reservoir should be identified and possibly acquired by Reclamation.

6. Prevent escapement of fish from Ridges Basin Reservoir. Fish must not be allowed to escape from Ridges Basin Reservoir, to prevent introduction of predators or competitors to native, endangered, and game fishes in the Animas and San Juan Rivers. Releases would be made through the dam outlet works and possibly through a water delivery system to the west and south of the reservoir. To minimize entrainment of fish, the dam outlets should be located as deep in the reservoir as possible to draw primarily anoxic hypolimnetic water, a zone likely to be devoid of fish in summer and winter. Reclamation must incorporate whatever means are necessary to prevent escapement of fish, and all methods must be approved by the Service and CDOW.

7. Initiate a stocking program for trout in the Animas River. For impacts within the Southern Ute Indian Reservation, a stocking program for trout in the Animas River should be initiated to ensure a reliable source of rainbow and Snake River cutthroat trout. Rainbow and cutthroat trout are currently stocked from Federal Colorado River Storage Project hatcheries, but these sources may not be reliable in the future because of high demands on these facilities and a possible change in the mission of these hatcheries from cold-water fishes to native fish production.

8. Continue the fish monitoring program identified in the 1996 FSFES. Reclamation should continue to support a fish monitoring program for the Animas and La Plata Rivers to evaluate Project impacts and to monitor status and trends of fish populations. Monitoring should be conducted on an annual basis to determine distribution, abundance, and demographic characteristics of fish populations. Monitoring should be continued for development of a baseline database. This program will help to evaluate the effectiveness of the trout stocking program and ensure the "Gold Medal" fishery designation is maintained.

9. Provide access for anglers to the Animas River. Reclamation should provide better access to the Animas River for angling and rafting. At present, access is limited downstream of Basin Creek because of a checkerboard of land ownerships, including Southern Ute Tribal land, state land, and private land. To mitigate possible losses in angling opportunities from reduced flows of the Animas River, access should be acquired at various points on the river to allow bank and boat anglers greater opportunities. The number of access points and locations should be negotiated with the SUIT, and access to private land should be based on a willing seller or lessee basis.

10. Legally protect instream flows. Reclamation and other resource agencies (e.g., CDOW, Colorado Water Conservation Board, State of New Mexico) should participate and assist in acquiring legal protection for instream flows to benefit native fish. Flows in the Animas River need to be maintained year around to allow for continuous maintenance of fish habitat and fish passage. Flows in other systems, such as the La Plata River (if used as mitigation) also need to be legally protected to insure adequate surface flows.

11. Use the La Plata River as the delivery system for Project water. Reclamation, in cooperation with other appropriate agencies, should construct a fresh water treatment facility at Shiprock, New Mexico. By constructing this new facility, Project water could be delivered via the La Plata and San Juan Rivers to Shiprock, New Mexico.

12. Develop a mitigation plan for native fishes. The potential impact of the ALP on native fishes will be difficult to mitigate on the Animas River. Investigations should be initiated to determine if fish passage barriers and flow depletion in late summer are impacting native fish populations (see recommendation 8). If a significant impact is occurring, Reclamation should investigate the possibility of providing passage for fish throughout the Animas River and providing minimum flows for fish habitat. Off-site mitigation opportunities are needed to protect and enhance native fish populations in the San Juan River Basin. Benefits for native fishes can be gained on the La Plata River by supplementing minimum flows by 5 cfs during a 6-month period of July 1 through October 15. This will provide habitat and passage for flannelmouth suckers, bluehead suckers, and roundtail chub in the La Plata River and could expand populations of these native fishes downstream into historic habitat in New Mexico.

13. Develop a Resource Management Plan (RMP) for Ridges Basin. A Resource Management Plan must be prepared for all activities expected for Ridges Basin.

8.2 TERRESTRIAL RESOURCES

1. All construction activities must minimize impacts to resources. Construction activities for all components of this project must minimize impacts to wildlife and habitats. This should include measures to limit direct and indirect impacts. Construction activities must also avoid critical periods for nesting raptors, elf calving and deer fawning.

2. Obtain permit for potential "take" of golden eagle nests. The permit would be limited to indirect or incidental situations only. A take permit will not be issued to provide for a pipeline route. Should "take", of one or both golden eagle nests on Carbon Mountain, result from any construction activity, or abandonment of the nest occur from any aspect of this project, reclamation must seek appropriate mitigation in the form of artificial nesting structures placed in appropriate locations on Carbon Mountain.

3. Mitigate loss of wildlife habitats in Ridges Basin. Property equal to approximately 2,700-2,900 acres of equivalent wildlife habitat must be acquired, and enhanced to offset losses from inundation by Ridges Basin Reservoir. Mitigation of Project impacts must replace the functions of affected habitats. Mitigation measures must include operation and maintenance funding to ensure that benefits to wildlife are perpetuated for the life of the project.

4. Ridges Basin Reservoir recreational facilities should be kept at a minimum level. Recreational facilities should be restricted to the north shore of the reservoir. Facilities should be

kept at minimal development level to minimize human disturbance to wildlife, particularly overwintering big game, calving/fawning areas and during migration periods.

5. Restrict future development around the reservoir to protect wildlife habitat values. Wildlife and their habitats surrounding the reservoir must be protected in perpetuity. The RMP for Ridges Basin should prohibit any future development of project lands.

6. Close all recreational facilities from November 15-May 1. Seasonal restrictions of the use of recreational facilities from November 15-May 1 will allow big game animals to use remaining winter range and historic calving/fawning areas.

7. Trails within the basin should be restricted to foot traffic only. Traffic on established trials and any trails created within the Ridges Basin area must be restricted to foot traffic only.

8. Wildlife-related activities should be strongly encouraged for Ridges Basin, including hiking, fishing, hunting, and wildlife viewing. These activities are less likely to have significant impacts to wildlife and habitat.

9. Reroute County Road 211 to State Highway 141 near Wildcat Canyon (Rafter J route). This route would require 3.1 miles of new road to connect CR 211 from the east with State Highway 141 near Wildcat Canyon. This route is preferred primarily because it allows for discontinuation of CR 211 for about 2.5 miles to the northwest of the reservoir, and provides an undisturbed buffer zone for migrating big game moving along the northwest and west shore of the reservoir, which have been documented by CDOW as a primary migration corridor for deer and elk.

10. Eliminate secondary roads from the new County Road 211. All unnecessary secondary roads within the basin, should be obliterated, recontoured, and planted with native vegetation. Future access should be discouraged with physical barriers to motorized vehicles, to minimize disturbances to wildlife, particularly overwintering and migrating big game.

8.3 RIPARIAN-WETLANDS

1. Initiate the monitoring program identified in the 1996 FSFES. A monitoring program should be initiated, after a record of decision has been issued, to establish a comprehensive baseline understanding of existing riparian-wetland conditions along the Animas River and Basin Creek corridors. The purpose of the baseline monitoring would be to develop a database that can be used to identify and assess future riparian-wetland impacts that would result from Project operation. Monitoring should not be considered as mitigation for project impacts, but should be used only as a tool to verify operational effects. Once the extent of the impacts has been determined, appropriate mitigation must be initiated to offset the impacts. Monitoring should also be done to assess the success of Project mitigation. Mitigation monitoring should be used to determine whether Project impacts have been adequately compensated. If monitoring reveals

any inadequacies in the replacement of habitat, mitigation should be adjusted and reimplemented if necessary.

2. Develop a comprehensive mitigation plan for the 121 acres of riparian-wetlands that will be impacted in Ridges Basin. Prior to the issuance of contracts for Project construction, Reclamation must identify mitigation lands and develop a comprehensive mitigation plan to replace the ecological functions of the 121 acres of riparian-wetlands that will be lost within the basin. The mitigation plan must include the appropriate mitigation ratios provided in Table 6.

3. Develop site-specific best management practices for the construction of Project components. Prior to issuance of contracts to construct various components of the project, Reclamation must develop site-specific best management practices for each location of potential impact. These best management practices will ensure that indirect impacts to all resources will be kept to a minimum during Project construction.

4. Develop a mitigation plan to replace the riparian-wetlands that will be impacted by the armoring of Basin Creek to convey Project water to the Animas River. Opportunities to mitigate riparian-wetland impacts along Basin Creek or in close proximity to the Animas River confluence should be given first consideration. If no practicable mitigation sites are available, these impacts should be mitigated in the La Plata River Valley in association with the Ridges Basin mitigation.

5. Develop a flow regime for Basin Creek to maintain riparian-wetlands located downstream of the dam site. Reclamation must provide minimum flows down Basin Creek to maintain the ecological processes of any existing riparian-wetlands that would not be impacted by channel armoring or conveyance of Project water.

6. Use directional boring for pipeline crossings of the Animas River. Direction boring should be employed wherever practicable to reduce temporary impacts to aquatic and riparian-wetland habitats associated with the Animas and San Juan Rivers. Direction boring will also limit sediment disruption during periods of low flows. Directional boring is not possible in the San Juan River due to deep river bed cobbles where bore holes can't be maintained.

7. It is recommended that Reclamation investigate the practicability of using the La Plata and San Juan Rivers to convey Project water for M&I use at Shiprock. Project water would be piped from Ridges Basin to the Cherry Creek confluence on the La Plata River. This modus of delivery would essentially provide for the protection of instream flows in reaches of the La Plata River that are chronically dewatered during the irrigation season. In addition to the restoration and enhancement of aquatic habitat, protection of instream flows would restore and enhance riparian-wetland habitats. The improvement of streamside vegetation would greatly improve fish and wildlife habitat values along the La Plata River, especially in New Mexico. Nearly the entire length of the La Plata River is chronically dewatered in New Mexico by irrigation diversions. M&I delivery for Shiprock, conveyed down the La Plata River, would essentially restore and/or

enhance riparian/stream ecosystems of the La Plata River between the San Juan River confluence and the Cherry Creek confluence, a distance of approximately 39 river miles. Ecological benefits would be significant, especially for the approximately 25 miles of river that is chronically dewatered in New Mexico.

9.0 UNMITIGATED RESOURCE LOSSES

The Project will result in unavoidable impacts to fish and wildlife resources. However, in most cases these losses should be mitigable. Wildlife resources which are negatively impacted should be mitigated to avoid net loss of those resources. Particular emphasis should be given to those resources identified by the Service, CDOW, and NMDGF as being of special concern and which are at greatest risk. No net losses should occur to habitats with significant wildlife value. No Federal action should cause, accelerate, or perpetuate the decline of a species, a population, or a valuable or unique habitat type.

Wildlife resource issues addressed in this Report were identified by the Service, the State wildlife agencies of Colorado and New Mexico, Southern Ute Indian Tribe, Ute Mountain Ute Indian Tribe and the Navajo Nation as being important and of special concern. Many of the identified resources are considered by these agencies to be at specific risk to Project actions or at risk on a larger scale and may be further negatively impacted by Project actions. Therefore, specific mitigation recommendations are presented in this document to help avoid, minimize, or mitigate negative impacts to these resources.

Any losses of these fish and wildlife resources resulting from Project actions for which Reclamation does not take recommended or alternatively suitable mitigating measures will be considered by the Service as unmitigated resource losses. On several issues, Reclamations's position on mitigation is noncommittal or vague. Based on this lack of commitment, we believe construction and operation of the project may cause unmitigated losses to the following resources.

1. Native fish in the Animas River, without mitigation that would result in no net loss of aquatic habitat, to be completed in advance or concurrent with project impacts.

2. Wildlife habitats, without operation and maintenance funding in perpetuity.

3. Animas River trout populations and recreational fishery, without monitoring, and appropriate mitigation for impacts that occur on non-reservation lands from the Durango Pumping Plant to the Southern Ute Indian Reservation (Gold Medal Fishery).

4. Golden eagle nests on Carbon Mountain if nests are "taken" and appropriate mitigation is not completed.

5. Riparian-wetland habitat along the Animas River corridor, without monitoring and completion of appropriate mitigation.

10.0 LITERATURE CITED

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APPENDIX A

LIST A-1. BATS KNOWN OR LIKELY TO OCCUR IN LA PLATA COUNTY (Report created by CDOW on October 20, 1999). See List A-7 for abundance codes.

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
California Myotis	*Myotis californicus stephensi*	K	FC
Western Small-footed Myotis	*Myotis ciliolabrum*	K	C
Long-eared Myotis	*Myotis evotis evotis*	K	FC
Little Brown Myotis	*Myotis lucifugus carissima*	K	AB
Fringed Myotis	*Myotis thysanodes thysanodes*	K	R
Long-legged Myotis	*Myotis volans interior*	K	C
Yuma Myotis	*Myotis yumanensis yumanensis*	K	FC
Hoary Bat	*Lasiurus cinereus cinereus*	K	C
Silver-haired Bat	*Lasionycteris noctivagans*	K	C
Western Pipistrelle	*Pipistrellus hesperus*	K	FC
Big Brown Bat	*Eptesicus fuscus pallidus*	K	AB
Townsend's Big-eared Bat	*Plecotus townsendii pallescens*	K	UC
Pallid Bat	*Antrozous pallidus pallidus*	L	UN
Brazilian Free-tailed Bat	*Tadarida brasiliensis mexicana*	K	UN
Big Free-tailed Bat	*Nyctinomops macrotis*	L	UN

LIST A-2. BIRDS KNOWN OR LIKELY TO OCCUR IN LA PLATA COUNTY (List created on October 20, 1999, by CDOW. Migrants are not given abundance values). See List A-7 for abundance codes.

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Pied-billed Grebe	*Podilymbus podiceps*	K	UC
Eared Grebe	*Podiceps nigricollis*	K	
Western Grebe	*Aechmophorus occidentalis*	K	
Clark's Grebe	*Aechmophorus Clarkii*	K	
Am. White Pelican	*Pelecanus erythrorhynchus*	K	
Double-crested Cormorant	*Phalacrocorax auritus*	K	
American Bittern	*Botaurus lentiginosus*	K	UN
Great Blue Heron	*Ardea herodias*	K	R
Great Egret	*Ardea alba*	K	
Snowy Egret	*Egretta thula*	K	
Cattle Egret	*Bubulcus ibis*	K	
Green Heron	*Butorides virescens*	K	
Black-crowned Night Heron	*Nycticorax nycticorax*	K	
White-faced Ibis	*Plegadus chihi*	K	
Turkey Vulture	*Cathartes aura*	K	C
Canada Goose	*Branta canadensis*	K	FC
Wood Duck	*Aix sponsa*	K	
Gadwall	*Anas strepera*	K	
American Wigeon	*Anas americana*	K	
Mallard	*Anas platyrhynchos*	K	C
Blue-winged Teal	*Anas discors*	K	
Cinnamon Teal	*Anas cyanoptera*	K	UC
Northern Shoveler	*Anas clypeata*	K	

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Northern Pintail	*Anas acuta*	K	
Green-winged Teal	*Anas crecca*	K	UC
Canvasback	*Aythea valisineria*	K	
Redhead	*Aythea americana*	K	
Ring-necked Duck	*Aythea collaris*	K	
Lesser Scaup	*Aythea affinis*	K	
Bufflehead	*Bucephala albeola*	K	
Barrow's Goldeneye	*Bucephala ilandica*	K	
Hooded Merganser	*Lophodytes cucullatus*	K	
Common Merganser	*Mergus merganser*	K	R
Ruddy Duck	*Oxyura jamaicensis*	K	R
Osprey	*Pandion haliaetus*	K	R
Bald Eagle	*Haliaeetus leucocephalus*	K	UN
Northern Harrier	*Circus cyaneus*	K	R
Sharp-shinned Hawk	*Accipiter striatus*	K	UC
Cooper's Hawk	*Accipiter cooperii*	K	UC
Northern Goshawk	*Accipiter gentilis*	K	R
Swainson's Hawk	*Buteo swainsoni*	K	R
Red-tailed Hawk	*Buteo jamaicensis*	K	FC
Ferruginous Hawk	*Buteo regalis*	K	
Golden Eagle	*Aquila chrysaetos*	K	UC
American Kestrel	*Falco sparverius*	K	FC
Peregrine Falcon	*Falco peregrinus*	K	R
Prairie Falcon	*Falco mexicanus*	K	UC
Ring-necked Pheasant	*Phasianus colchicus*	K	UC

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Northern Sage Grouse	*Centrocercus urophasianus*	K	
Gunnison Sage Grouse	*Centrocercus urophasianus*	K	CA
White-tailed Ptarmigan	*Lagopus leucurus*	K	R
Blue Grouse	*Dendrgapus obscurus*	K	UC
Wild Turkey	*Meleagris gallopavo*	K	UC
Gambel's Quail	*Callipepla gambelii*	K	UC
Virginia Rail	*Rallus limicola*	K	UC
Sora	*Porzana carolina*	K	UC
American Coot	*Fulica americana*	K	FC
Sandhill Crane	*Grus canadensis*	K	
Snowy Plover	*Charadrius alexandrinus*	K	
Killdeer	*Chardrius vociferus*	K	FC
Black-necked Stilt	*Himantopus mexicanus*	K	
American Avocet	*Recurvirostra americana*	K	
Willet	*Catoptrophorus semipalmatus*	K	
Spotted Sandpiper	*Actitis macularia*	K	FC
Long-billed Curlew	*Numenius americanus*	K	
Common Snipe	*Gallinago gallinago*	K	UC
Wilson's Phalarope	*Phaloropus tricolor*	K	R
California Gull	*Larus californicus*	K	
Forster's Tern	*Sterna fosteri*	K	
Black Tern	*Chilidonias niger*	K	
Rock Dove	*Columba livia*	K	C
Band-tailed pigeon	*Columbia fasciata*	K	UC
Mourning Dove	*Zenaida macroura*	K	C

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Yellow-billed Cuckoo	*Coccyzus americanus*	K	V
Greater Roadrunner	*Geococcyx californianus*	K	V
Barn Owl	*Tyto alba*	K	UN
Flammulated Owl	*Otus flammeolus*	K	UC
Western Screech-Owl	*Otus kennicottii*	K	R
Great Horned Owl	*Bubo virginianus*	K	UC
Northern Pygmy-Owl	*Glaucidium gnoma*	K	R
Burrowing Owl	*Athene cunicularia*	K	S
Spotted Owl	*Strix occidentalis*	K	UN
Long-eared Owl	*Asio otus*	K	UC
Short-eared Owl	*Asio flammeus*	K	UN
Boreal Owl	*Aegolius funereus*	K	R
Northern Saw-whet Owl	*Aegolius acadicus*	K	UC
Common Nighthawk	*Chordeiles minor*	K	C
Common Poorwill	*Phalaenoptilus nuttallii*	K	UC
Black Swift	*Cypseloides niger*	K	UC
Chimney Swift	*Chaetura pelagica*	K	
White-throated Swift	*Aeronautes saxatalis*	K	FC
Black-chinned Hummingbird.	*Archilochus alexandri*	K	C
Broad-tailed Hummingbird	*Selasphorus platycercus*	K	C
Belted Kingfisher	*Ceryle alcyon*	K	FC
Lewis' Woodpecker	*Melanerpes lewis*	K	UC
Red-headed Woodpecker	*Melanerpes erythrocephalus*	K	
Acorn Woodpecker	*Melanerpes formicivorus*	K	CA
Williamson's Sapsucker	*Sphyrapicus thyrodeus*	K	UC

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Red-naped Sapsucker	*Shpyrapicus nuchalis*	K	UC
Downy Woodpecker	*Picoides pubescens*	K	UC
Hairy Woodpecker	*Picoides villosus*	K	UC
Three-toed Woodpecker	*Pioides tridactylus*	K	UC
Red-shafted Flicker	*Colaptes auratus*	K	FC
Olive-sided Flycatcher	*Contopus cooperi*	K	UC
Western Wood-Pewee	*Contopus sordidulus*	K	FC
Willow Flycatcher	*Empidonax trailli*	K	UC
Hammond's Flycatcher	*Empidonax hammondii*	K	UC
Gray Flycatcher	*Empidonax wrightii*	K	UC
Dusky Flycatcher	*Empidonax oberholseri*	K	FC
Cordilleran Flycatcher	*Empidonax occidentalis*	K	FC
Black Phoebe	*Sayornis nigricans*	K	UN
Eastern Phoebe	*Sayornis phoebe*	K	
Say's Phoebe	*Sayornis saya*	K	FC
Vermilion Flycatcher	*Pyrocephalus rubinus*	K	
Ash-throated Flycatcher	*Myiarchus cinerascens*	K	FC
Cassin's Kingbird	*Tyrannus vociferans*	K	FC
Western Kingbird	*Tyrannus verticalis*	K	FC
Eastern Kingbird	*Tyrannus tyrannus*	K	R
Scissor-tailed Flycatcher	*Tyrannus forficatus*	K	
Loggerhead Shrike	*Lanius ludovicanus*	K	UN
Gray Vireo	*Vireo vicinior*	K	R
Plumbeous Vireo	*Vireo plumbeus*	K	FC
Warbling Vireo	*Vireo gilvus*	K	C

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Red-eyed Vireo	*Viro olivaceus*	K	
Gray Jay	*Perisoreus canadensis*	K	UC
Steller's Jay	*Cyanocitta stelleri*	K	FC
Blue Jay	*Cyanocitta cristata*	K	
Western Scrub-Jay	*Aphelocoma californica*	K	FC
Pinyon Jay	*Gymnorhinus cyanocepahlus*	K	FC
Clark's nutcracker	*Nucifraga columbiana*	K	FC
Black-billed Magpie	*Pica pica*	K	C
American Crow	*Corvus brachyrhynchos*	K	FC
Common Raven	*Corvus corax*	K	FC
Horned Lark	*Eremophila alpestris*	K	UC
Purple Martin	*Progne subis*	K	R
Tree Swallow	*Tachycineta bicolor*	K	C
Violet-green Swallow	*Tachycineta thalassina*	K	C
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	K	FC
Bank Swallow	*Riparia riparia*	K	C
Cliff Swallow	*Petrochelidon pyrrhonota*	K	A
Barn Swallow	*Hirunda rustica*	K	C
Black-capped Chickadee	*Poecile atricapillus*	K	FC
Mountain Chickadee	*Poecile gambeli*	K	C
Juniper Titmouse	*Baeolophus griseus*	K	FC
Bushtit	*Psaltriparus minimus*	K	FC
Red-breasted Nuthatch	*Sitta canadensis*	K	FC
White-breasted Nuthatch	*Sitta carolinensis*	K	FC
Pygmy Nuthatch	*Sitta pygmaea*	K	FC

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Brown Creeper	*Certhia americana*	K	UC
Rock Wren	*Salpinctes obsoletus*	K	FC
Canyon Wren	*Catherpes mexicanus*	K	UC
Bewick's Wren	*Thryomanes bewickii*	K	FC
House Wren	*Troglodytes aedon*	K	C
Marsh Wren	*Cistothorus palustris*	K	
American Dipper	*Cinclus mexicannus*	K	UC
Golden-crowned Kinglet	*Regulus satrapa*	K	UC
Ruby-crowned Kinglet	*Regulus calendula*	K	C
Blue-gray Gnatcatcher	*Polioptila caerulea*	K	C
Western Bluebird	*Sialia mexicana*	K	FC
Mountain Bluebird	*Sialia currucoides*	K	FC
Townsend's Solitaire	*Myadestes townsendi*	K	UC
Swainson's Thrush	*Catharus ustulatus*	K	R
Hermit Thrush	*Catharus guttatus*	K	C
American Robin	*Turdus migratorius*	K	C
Gray Catbird	*Dumetella carolinensis*	K	R
Northern Mockingbird	*Mimus polyglottos*	K	R
Sage Thrasher	*Oreoscoptes montanus*	K	R
Brown Thrasher	*Toxostoma rufum*	K	
European Starling	*Stunus vugaris*	K	A
American Pipit	*Anthus rubescens*	K	UC
Cedar Waxwing	*Bombycilla cedorum*	K	R
Orange-crowned Warbler	*Vermivora celata*	K	FC
Virginia's Warbler	*Vermivora virginiae*	K	FC

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Yellow Warbler	*Dendroica petechia*	K	FC
Chestnut-sided Warbler	*Dendroica pensylvanica*	K	
Yellow-rumped Warbler	*Dendroica coronata*	K	C
Black-throated Gray Warbler	*Dendroica nigrescens*	K	FC
Grace's Warbler	*Dendroica graciae*	K	UC
American Redstart	*Setophaga ruticilla*	K	
Northern Waterthrush	*Seiurus noveboracensis*	K	
MacGillivray's Warbler	*Oporonis tolmiei*	K	UC
Common Yellowthroat	*Geothlypis trichas*	K	FC
Wilson's Warbler	*Wilsonia pusilla*	K	FC
Yellow-breasted Chat	*Icteria virens*	K	FC
Western Tanager	*Piranga ludoviciana*	K	FC
Green-tailed Towhee	*Pipilo chlorurus*	K	C
Spotted Towhee	*Pipilo maculatus*	K	C
Chipping Sparrow	*Spizella passerina*	K	C
Brewer's Sparrow	*Spizella breweri*	K	FC
Vesper Sparrow	*Pooecetes gramineus*	K	C
Lark Sparrow	*Chondestes grammacus*	K	FC
Black-throated Sparrow	*Amphispiza bilineata*	K	R
Sage Sparrow	*Amphispiza belli*	K	CA
Lark Bunting	*Calamospiza melanocorys*	K	CA
Savannah Sparrow	*Passerculus sandwichensis*	K	UN
Fox Sparrow	*Passerella iliaca*	K	UN
Song Sparrow	*Melospiza melodia*	K	FC
Lincoln's Sparrow	*Melospiza lincolnii*	K	FC

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
White-crowned Sparrow	*Zonotrichia leucophrys*	K	C
Dark-eyed Junco	*Junco hyemalis caniceps*	K	C
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	K	
Black-headed Grosbeak	*Pheucticus melanocephalus*	K	FC
Blue Grosbeak	*Guiraca caerulea*	K	FC
Lazuli Bunting	*Passerina amoena*	K	FC
Indigo Bunting	*Passerina cyanea*	K	R
Bobolink	*Dolichonyx oryzivorus*	K	
Red-winged Blackbird	*Agelaius phoeniceus*	K	A
Western Meadowlark	*Sturnella neglecta*	K	A
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	K	C
Brewer's Blackbird	*Euphagus cyanocephalus*	K	C
Common Grackle	*Quiscalus quiscula*	K	UC
Great-tailed Grackle	*Quiscalus mexicanus*	K	UC
Brown-headed Cowbird	*Melothrus ater*	K	C
Bullock's Oriole	*Icterus bullockii*	K	FC
Brown-capped Rosy-Finch	*Leucosticte australis*	K	UC
Pine Grosbeak	*Pinicola enucleator*	K	UC
Cassin's Finch	*Carpodacus cassinii*	K	UC
House Finch	*Carpodacus mexicanus*	K	C
Red Crossbill	*Loxia curvirostra*	K	UC
Pine Siskin	*Carduelis pinus*	K	C
Lesser Goldfinch	*Carduelis psaltria*	K	FC
American Goldfinch	*Carduelis tristis*	K	UC
Evening Grosbeak	*Coccothraustes vespertinus*	K	FC
House sparrow	*Paser domesticus*	K	A

LIST A-3. REPTILES AND AMPHIBIANS KNOWN OR LIKELY TO OCCUR IN LA PLATA COUNTY (List created on October 20, 1999, by CDOW). See List A-7 for abundance codes.

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Tiger Salamander	*Ambystoma tigrinum*	K	LC
New Mexico Spadefoot	*Spea multiplicata*	K	UN
Boreal Toad	*Bufo boreas boreas*	L	UN
Red-spotted Toad	*Bufo punctatus*	K	R
Woodhouse's Toad	*Bufo woodhousii woodhousii*	K	C
Canyon Treefrog	*Hyla arenicolor*	L	UN
Western Chorus Frog	*Pseudacris triseriata maculata*	K	C
Bullfrog	*Rana catesbeiana*	K	LC
Northern Leopard Frog	*Rana pipiens*	K	LC
Painted Turtle	*Chrysemys picta bellii*	K	FC
Collared Lizard	*Crotaphytus collaris*	K	UC
Short-Horned Lizard	*Phrynosoma hernandezi*	K	FC
Sagebrush Lizard	*Sceloporus graciosus graciosus*	K	C
Eastern Fence Lizard	*Sceloporus undulatus*	K	C
Tree Lizard	*Urosaurus ornatus wrighti*	K	UC
Side-blotched Lizard	*Uta stansburiana uniformis*	L	UN
Many-lined Skink	*Eumeces multivirgatus*	K	FC
Western Whiptail	*Cnemidophorus tigris septentrionalis*	L	UN
Plateau Striped Whiptail	*Cnemidophorus velox*	K	C
Racer	*Coluber constrictor*	K	R
Milk Snake	*Lampropeltis triangulum*	K	R
Striped Whipsnake	*Masticophis taeniatus taeniatus*	K	UC
Smooth Green Snake	*Opheodrys vernalis blanchardi*	K	UC

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Gopher Snake	*Pituophis catenifer*	K	UC
Blackneck Garter Snake	*Thamnophis cyrtopsis cyrtopsis*	K	R
Western Terrestrial Garter Snake	*Thamnophis elegans vagrans*	K	FC
Western Rattlesnake	*Crotalus viridis*	K	UC

LIST A-4. LARGE MAMMALS KNOWN OR LIKELY TO OCCUR IN LA PLATA COUNTY (List created on October 20, 1999, by CDOW). See List A-7 for abundance codes.

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
American Pika	*Ochotona princeps*	K	FC
Desert Cottontail	*Sylvilagus audubonii*	K	FC
Mountain Cottontail	*Sylvilagus nuttallii*	K	FC
Snowshoe Hare	*Lepus americanus*	K	FC
Black-tailed Jackrabbit	*Lepus californicus*	K	UC
White-tailed Jackrabbit	*Lepus townsendii*	K	FC
Coyote	*Canis latrans*	K	C
Red Fox	*Vulpes vulpes*	K	FC
Gray Fox	*Urocyon cinereoargenteus*	K	UC
Black Bear	*Ursus americanus*	K	C
Ringtail	*Bassariscus astutus*	K	R
Raccoon	*Procyon lotor*	K	FC
American Marten	*Martes americana*	K	UC
Ermine	*Mustela erminea*	K	UC
Long-tailed Weasel	*Mustela frenata*	K	UC
Black-footed Ferret	*Mustela nigripes*	K	EX
Mink	*Mustela vison*	K	UC
Wolverine	*Gulo gulo*	L	UN
American Badger	*Taxidea taxus*	K	UC
Striped Skunk	*Mephitis mephitis*	K	FC
Northern River Otter	*Lutra canadensis*	K	R
Mountain Lion	*Felis concolor*	K	UC
Lynx	*Lynx canadensis*	K	VR

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Bobcat	*Lynx rufus*	K	UC
American Elk	*Cervus elaphus*	K	AB
Mule Deer	*Odocoileus hemionus*	K	AB
Moose	*Alces alces*	K	R
Bighorn Sheep	*Ovis canadensis*	K	FC
Bighorn Sheep, Rocky Mountain	*Ovis canadensis canadensis*	K	FC

LIST A-5. MEDIUM SIZE MAMMALS THAT ARE KNOWN OR LIKELY TO OCCUR IN LA PLATA COUNTY (List created on October 20, 1999, by CDOW). See List A-7 for abundance codes.

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Least Chipmunk	*Tamias minimus*	K	C
Colorado Chipmunk	*Tamias quadrivittatus*	K	FC
Golden-mantled Ground Squirrel	*Spermophilus lateralis*	K	FC
Rock Squirrel	*Spermophilus variegatus*	K	FC
Gunnison's Prairie Dog	*Cynomys gunnisoni*	K	FC
Gunnison's Prairie Dog	*Cynomys gunnisoni zuniensis*	K	FC
Abert's Squirrel	*Sciurus aberti*	K	FC
Chickaree	*Tamiasciurus hudsonicus*	L	UN
Botta's Pocket Gopher	*Thomomys bottae*	K	FC
Botta's Pocket Gopher	*Thomomys bottae aureus*	K	FC
Northern Pocket Gopher	*Thomomys talpoides*	K	C
Northern Pocket Gopher	*Thomomys talpoides fossor*	K	C
American Beaver	*Castor canadensis*	K	FC
Common Muskrat	*Ondatra zibethicus*	K	C
Common Porcupine	*Erethizon dorsatum*	K	UC

LIST A-6. SMALL MAMMALS KNOWN OR LIKELY TO OCCUR IN LA PLATA COUNTY (List created on October 20, 1999, by CDOW). See List A-7 for abundance codes.

COMMON NAME	SCIENTIFIC NAME	LP_OC	LP_AB
Masked Shrew	*Sorex cinereus*	L	UN
Dwarf Shrew	*Sorex nanus*	K	R
Water Shrew	*Sorex palustris*	K	UC
Plains Pocket Mouse	*Perognathus flavescens*	K	UN
Plains Pocket Mouse	*Perognathus flavescens apache*	K	UN
Western Harvest Mouse	*Reithrodontomys megalotis*	K	FC
Brush Mouse	*Peromyscus boylii*	K	FC
Deer Mouse	*Peromyscus maniculatus*	K	A
Pinyon Mouse	*Peromyscus truei*	K	C
White-throated Woodrat	*Neotoma albigula*	K	FC
White-throated Woodrat	*Neotoma albigula laplataensis*	K	FC
Bushy-tailed Woodrat	*Neotoma cinerea*	K	FC
Bushy-tailed Woodrat	*Neotoma cinerea arizonae*	K	FC
Bushy-tailed Woodrat	*Neotoma cinerea orolestes*	K	FC
Mexican Woodrat	*Neotoma mexicana*	K	FC
Mexican Woodrat	*Neotoma mexicana inopinata*	K	FC
House Mouse	*Mus musculus*	K	A
Southern Red-backed Vole	*Clethrionomys gapperi*	K	FC
Long-tailed Vole	*Microtus longicaudus*	K	FC
Montane Vole	*Microtus montanus*	K	C
Western Jumping Mouse	*Zapus princeps*	K	FC
Western Jumping Mouse	*Zapus princeps princeps*	K	FC
Western Harvest Mouse	*Reithrodontomys megalotis aztecus*	K	FC

LIST A-7. COUNTY OCCURRENCE CLASSIFICATION CRITERIA. The following are categories used to classify species occurrence on a county basis for the purposes of the NDIS project.

CODE	CATEGORY	DEFINITION
K	Known to Occur:	Species or sub-species known to occur in the county from actual records or sightings.
L	Likely to Occur:	No known records or sightings exist for the county, but the species is suspected to occur because of its proximity to adjacent counties having known records or the availability of suitable habitats.
(No code)	Does not Occur:	Species not known or likely to occur in the county at this time.

SPECIES CLASSIFICATIONS FOR COUNTY ABUNDANCE

The following are the abundance classes which will be used to categorize species abundance on a county basis for the purposes of the NDIS project. The categories are intended to be objective in the sense that specific numbers of individuals or groups are used to define the abundance class.

BIRDS

CODE	CATEGORY	DEFINITION
AB	Abundant:	Observed daily; >100/day in appropriate season and habitat
C	Common:	Observed daily; 25-100/day in appropriate season and habitat
FC	Fairly Common:	Observed daily; 10-25/day in appropriate season and habitat
UC	Uncommon:	Usually observed daily in appropriate season and habitat; 1-10/day OR species may be gregarious so that a large group may be observed at one time, but usually only 1-2 groups per day is observed.
R	Rare:	Usually **not** observed daily in appropriate season and habitat; 1-5/day and 1-10/season OR species may be gregarious so that a large group may be observed at one time, but usually only 1 group is observed.

VR	Very Rare:	10-40 records (includes all historical records) for the state as a whole
CA	Casual/Accidental:	1-9 records (includes all historical records)
EX	Extirpated:	Known to have historically occurred, but known to no longer be present
UN	Unknown:	Known to occur, but can't be placed in any of the abundance categories above.

MAMMALS

AB	Abundant:	Observed daily; >100/day in appropriate season and habitat OR the dominant species (in terms of number) collected by standard techniques in appropriate season and habitat
C	Common:	Observed daily; 25-100/day in appropriate season and habitat OR one of the most common species collected by standard techniques in appropriate season and habitat
FC	Fairly Common:	Observed daily; 10-25/day in appropriate season and habitat OR expected to be collected daily in small numbers by standard techniques in appropriate season and habitat
UC	Uncommon:	Usually observed daily in appropriate season and habitat; 1-10/day OR species may be gregarious so that a large group may be observed at one time, but usually only 1-2 groups per day is observed OR usually collected daily in appropriate season and habitat by use of standard techniques
R	Rare:	Usually **not** observed daily in appropriate season and habitat; 1-5/day and 1-10/season OR species may be gregarious so that a large group may be observed at one time, but usually only 1 group is observed OR usually **not** collected daily in appropriate season and habitat by use of standard techniques
VR	Very Rare:	10-40 records (includes all historical records) for the state as a whole

CA	Casual/Accidental:	1-9 records (includes all historical records) for the state as a whole
EX	Extirpated:	Known to have historically occurred, but known to no longer be present
UN	Unknown:	Known or Likely to occur, but can't be placed in any of the abundance categories above.

AMPHIBIANS

CODE	CATEGORY	DEFINITION
C	Common:	10 or more individual adults or 4 or more breeding aggregations can usually be observed, and the species can usually be found in 75-100 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.
FC	Fairly Common:	5 to 10 individual adults or 2 to 3 breeding aggregations can usually be observed, and the species can usually be found in 50-75 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.
LC	Locally Common:	10 or more individual adults or 4 or more breeding aggregations can usually be observed, and the species can usually be found in 0-33 percent of sites surveyed in a single day by standard techniques and in appropriate seasons and habitats.
SC	Sparsely Common:	1 individual adult or 1 breeding aggregation can usually be observed in 67-100 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.
UC	Uncommon:	Fewer than 5 individual adults or at most 1 breeding aggregation can usually be observed, and the species can usually be found in less than 50 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.

R	Rare:	Fewer than 5 individual adults or 1 to 2 breeding aggregations can usually be observed, and the species can usually be found in less than 50 percent of areas surveyed **in a single season** by standard techniques and in appropriate seasons and habitats.
VR	Very Rare:	Fewer than 10 records (including all historic records) for the state.
E	Extirpated:	Known to have historically occurred, but known to no longer be present in a natural and free roaming condition.
UN	Unknown:	Can not be placed in any of the abundance categories above due to lack of information.

REPTILES

CODE	CATEGORY	DEFINITION
C	Common:	10 or more individual adults can usually be observed, and the species can usually be found in 75-100 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.
FC	Fairly Common:	5 to 10 individual adults can usually be observed, and the species can usually be found in 50-75 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.
LC	Locally Common:	10 or more individual adults can usually be observed, and the species can usually be found in 0-33 percent of sites surveyed in a single day by standard techniques and in appropriate seasons and habitats.
SC	Sparsely Common:	1 individual adult can usually be observed in 67-100 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.
UC	Uncommon:	Fewer than 5 individual adults can usually be observed, and the species can usually be found in less than 50 percent of areas surveyed in a single day by standard techniques and in appropriate seasons and habitats.

R	Rare:	Fewer than 5 individual adults can usually be observed, and the species can usually be found in less than 50 percent of areas surveyed **in a single season** by standard techniques and in appropriate seasons and habitats.
VR	Very Rare:	Fewer than 10 records (including all historic records) for the state.
E	Extirpated:	Known to have historically occurred, but known to no longer be present in a natural and free roaming condition.
UN	Unknown:	Can not be placed in any of the abundance categories above due to lack of information.

2-Dimensional Depiction of Amphibian and Reptile Abundance Classes[2]			
	0-33 Percent of Sites	34-66 Percent of Sites	67-100 Percent of Sites
>10 Individual/Sites	Locally Common	Fairly Common	Common
2-10 Individuals/Sites	Uncommon	Fairly Common	Fairly Common
1 Individual/Site	Rare	Uncommon	Sparsely Common

[2]This table created by Hammerson to more easily depict Abundance Criteria.

Appendix B

LETTERS OF CONCURRENCE

STATE OF COLORADO

OFFICE OF THE EXECUTIVE DIRECTOR

Department of Natural Resources
1313 Sherman Street, Room 718
Denver, Colorado 80203
Phone: (303) 866-3311
TDD: (303) 866-3543
Fax: (303) 866-2115

DEPARTMENT OF NATURAL RESOURCES

Bill Owens
Governor

Greg E. Walcher
Executive Director

June 6, 2000

LeRoy W. Carlson, Colorado Field Supervisor
U.S. Fish and Wildlife Service, Ecological Services
755 Parfet Street, Suite 361
Lakewood, CO 80215

RE: USFWS Final Coordination Act Report on Animas-La Plata Project

Dear Mr. Carlson:

Staff Biologists from the Division of Wildlife have reviewed the final draft, dated March 2, 2000, for the project and have found that all of the concerns outlined in my letter of December 20, 1999 have been adequately addressed in the new draft. We have no new comments related to the final draft.

I would like to thank you for giving the Division of Wildlife and the Department of Natural Resources the opportunity to comment on this report. We want to continue to work with you on this project as it moves toward completion.

Sincerely,

Greg Walcher,
Executive Director

GOVERNOR
Gary E. Johnson

DIRECTOR AND SECRETARY
TO THE COMMISSION
Gerald A. Maracchini

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH
Villagra Building
P.O. Box 25112
Santa Fe, NM 87504

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Farmington, NM
George A. Ortega
Santa Fe, NM

April 26, 2000

Mr. LeRoy W. Carlson
U. S. Fish and Wildlife Service
Ecological Services
755 Parfet Street, Suite 361
Lakewood, CO 80215

Re: Comments on final draft of the Fish and Wildlife Coordination Act Report for the Animas -La Plata Project.
NMGF No. 7012

Dear Mr. Carlson:

The New Mexico Department of Game and Fish (Department) has reviewed the final draft of the Fish and Wildlife Coordination Act Report (CAR) for the Animas -La Plata Project (ALP). In general we concur with the findings and recommendations of the CAR, but would like to submit the following comments.

Recently there has been considerable discussion and confusion regarding the scope of the proposed project as addressed in the Draft Supplemental Environmental Impact Statement (DSEIS) for ALP and its connection to the San Juan Recovery Implementation Plan (SJRIP). Further, there is some uncertainty regarding primary impacts that will occur as a consequence of implementing the ALP project and also of the secondary impacts that might occur as a consequence of implementing some of the proposed mitigation projects. We hope that this letter will clarify our position on these issues and outline what we believe is a reasonable approach to addressing ALP project impacts and appropriate mitigation in the CAR.

The Department concurs with the position of the U.S. Fish and Wildlife Service (USFWS) in Grand Junction and the Bureau of Reclamation (BOR) that the SJRIP issues and the associated

EIS for the reoperation of Navajo Dam, which will assess impacts resulting from the adoption of the proposed flow recommendations, are not within the scope of the ALP DSEIS, and that the two actions need not be connected. The Biological Opinion (1991) for ALP set the maximum allowed depletion at Four Corners to 57,100 a.f. As a result of this agreement, flow recommendations that accounted for this depletion were subsequently developed to protect endangered fish in the San Juan River. The future adoption of these flow recommendations clearly implies that the proposed depletion of the Animas River is acceptable to the SJRIP, because it maintains adequate protection for endangered fish. Consequently, the Department believes that the two actions can be analyzed separately and that impact analysis of ALP needs only to consider the primary impacts to the Animas River and appropriate mitigation for these impacts.

The Department also understands that the maximum allowed average depletion of 57,100 a.f. per year at Four Corners will result in a maximum average depletion of 93,100 a.f. per year in the Animas River below the pumping plant as water is pumped to Ridges Basin Reservoir for storage. This will necessarily reduce flows in the Animas River in New Mexico. We concur with the CAR that the most significant project impact to fish and wildlife in New Mexico will be the reduction of wetted habitat in the river and its effect on native fishes.

The Department would prefer that, if possible, all impacts to native fishes be mitigated in the Animas River. In a 19 July 1999 letter to Susan Moyer, Assistant Colorado Field Supervisor, we suggested several mitigation proposals (some of which have already been considered in the CAR) that might be appropriate. The Department reiterates that research studies determining the impact of the project to native fish in New Mexico **should not constitute mitigation for any impacts associated with ALP. This should be clearly stated in the CAR.** Because mitigation will not occur until after the implementation of ALP and the completion of the monitoring study, adequate money should be secured with the initial funding for ALP, so the Department has a reasonable assurance that future mitigation activities can be financed. We therefore resubmit these mitigation proposals for your consideration:

1) Set up a trust account with sufficient funds to study, design, and implement appropriate mitigation projects for direct and future impacts in New Mexico and Colorado resulting from implementation of the Animas La Plata project.

2) Design and implement a study to understand the factors limiting the (re)establishment of

roundtail chub in the lower Animas River (for example, water quality). Although a reproducing population occurs in the Florida River, Colorado, no apparent recruitment occurs from downstream larval drift into the Animas River.

3) Design and implement a study to understand the factors that currently limit the use of the Animas River as potential spawning habitat for the Colorado River pikeminnow.

4) Design and implement appropriate studies to better understand the factors causing fish diseases in the lower Animas River.

5) Further investigate approaches, and implement projects to remove the barriers to movement and migration, and limit entrainment of larval native fish in existing diversion structures in the main-stem of the Animas River and other tributaries of the San Juan River in New Mexico.

6) Develop a watershed plan and recommendations for best management practices that can be implemented to improve water quality in the Animas River. This plan should specifically focus on reducing heavy metals originating from historical mining districts in the upper watershed, reducing the amount of fine sediment originating from the Animas valley between Bakers Bridge and Durango, Colorado, and reducing the impacts from irrigation and M & I return flows.

7) The BOR should consider the development of additional grow-out ponds for the Colorado pikeminnow and razorback sucker for re-introduction into the Animas River and San Juan River. The Department previously recommended the development of grow out ponds for razorback sucker and other endangered fishes for reintroduction into the San Juan River and its tributaries and believes that additional ponds would be greatly beneficial to the recovery of these species. The Department is aware that the BOR does not support the development of grow-out ponds that would be supportive of the SJRIP, because they are not within the scope of impacts related to ALP. We agree with the BOR that federal actions on the San Juan and Animas rivers ***need*** not necessarily be considered as connected, but this should not preclude the BOR from considering mitigation on the San Juan if it is appropriate for mitigating the impacts to native fish in the Animas. The Department requests that the BOR reconsider its position. Historic records indicate that Colorado pikeminnow and razorback suckers may previously have occupied some

reaches of the Animas River (Jordon, 1891). Given this information, the difficulty of finding appropriate mitigation opportunities on the Animas River and the relative ease with which this project could be implemented, we believe that the development of grow-out ponds is appropriate mitigation for impacts to the Animas River and should be considered by the BOR.

Significant reductions in flow and water quality currently occur on the Animas River due to irrigation diversions and returns in New Mexico. The Department believes that it will be difficult to appropriately mitigate for further reduced flows in the Animas River as a result of ALP given the current poor condition of the river. Accordingly, we agree ***in principle*** to the recommendation in the CAR that providing perennial flows to reaches of the La Plata River in New Mexico for the benefit of native fish is perhaps the best hope of appropriate mitigation for losses on the Animas River.

However, the Department is aware that there are many misunderstandings and philosophical disagreements regarding this mitigation approach. Whatever the origin of these misunderstandings, it is clear that the inclusion of more specific information in the CAR would better inform interested parties of the potential costs and benefits of this mitigation alternative. The following questions should be addressed:

1) Where will the water for the La Plata River come from? Is it project water? Will there be additional depletions? When will the water be taken from the Animas River? How much will be taken?
2) How will the water be transported to the La Plata drainage?
3) How will the water be protected from diversion in New Mexico?
4) For what length of time will the water be needed?
5) What will be the benefit to native fish in the La Plata?
6) What will be the additional impacts to the Animas River?
7) How will non-natives be excluded from entering the La Plata River (and Animas River) from Ridges Basin Reservoir?
8) What are the technical approaches to assure fish exclusion? Sand filters? Pressure changing devices? What are the potential problems?
9) Who will operate and maintain the screening devices?
10) How will hypolimnetic water from Ridges Basin be heated to avoid cold shock of La Plata fish when water is diverted?

11) Which diversion structures on the La Plata need to remain to prevent upstream migration of no-native fish?
12) How much water is necessary to provide adequate habitat for native fish in the La Plata River during irrigation season?

The Department is particularly concerned about the release of non-native fish from Ridges Basin into the La Plata, Animas and San Juan Rivers and the possible impact on native fishes. This would be counter to current efforts to control non-natives, an important element of the SJRIP for the recovery of the endangered fish in the San Juan River, and would perhaps trigger further Section 7 consultations with the USFWS and possibly a jeopardy opinion for the endangered fish recovery program in the San Juan River. We support the recommendation of the CAR that the Ridges Basin fishery should be limited to a cold water fishery and stocked with only those fish that will not create significant impacts to native fish, should they escape. We further recommend prohibiting the use of bait fish in the reservoir. Alternatively, we suggest that regulations regarding the stocking of non-native fish be consistent with recommendations developed for the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin.

The Department is also aware that some people may be philosophically opposed to taking even project water from one river basin to another and may believe that any project water earmarked for mitigation should stay in the Animas River. Because of the present poor condition of the native fish community in the Animas River, mitigation projects on the Animas River alone may not provide adequate mitigation for impacts to native fishes. The Department believes that taking 5 to10 cfs (or whatever quantity of water is agreed upon that will provide adequate habitat for native fishes) of project water at the peak of spring runoff for use in the La Plata River during low flow periods, is an appropriate use of water for mitigation. This amount of water is a small part of the spring flow in the Animas River, but it will provide the entire flow in the La Plata River when needed. However, the Department is concerned that no clear mechanism has been identified to protect project water in the La Plata River. Accordingly, we request (contingent on adequate solutions to the technical issues addressed above) that the BOR consider building a water treatment plant in Shiprock and delivering project water via the La Plata River, as an additional alternative to those so far considered in the DSEIS.

We understand that the BOR may be reluctant to commit resources to further explore the technical feasibility of using the La Plata River for mitigation without an initial consensus among

the interested parties, but it appears that without more specific information up-front, misunderstandings will still occur and a consensus on the technical feasibility of this project will not be reached. Although we understand that much of this information is in the DSEIS, there are some questions that, although they have been discussed in one forum or another, have not been put in the DSEIS or the CAR. Perhaps they will be in the forthcoming Biological Opinion? (as of 24 April 2000, the Department had not received a copy of the new draft Biological Opinion). We suggest that more specific information in the CAR is better than less, and recommends the addition of language that will address the above issues or a statement noting that the information will be provided in the B.O. at a later date.

The Department has the following specific comments:

1) Page 21. Roundtail chub is listed as endangered by New Mexico, not a species of concern.
2) Page 29. Is there any evidence to suggest that native fish generally spawn below the Durango Pumping Plant? If so, please reference.
3) Page 29. Change "ameliorated" to "lessened"

The Department appreciates the opportunity to comment on the CAR. If you have any further questions please contact Nic Medley, Aquatic Habitat Biologist of my staff at (505) 827-9907 or nmedley@state.nm.us.

Sincerely,

for

Tod W. Stevenson, Chief
Conservation Services Division

TWS/CNM

cc: Lieutenant Governor Walter Bradley
Kurt Broderdorp (ALP Biologist, Ecological Field Office USFWS, Grand Junction, CO)
Carol DeAngelis (Western Colorado Area Manager, BOR, Grand Junction)
Joy Nicholopolous (Supervisor, Ecological Field Office, USFWS, Albuquerque, NM)
Brian Hansen (Federal Projects and Environmental Contaminants Chief, Ecological Field

Office USFWS, Albuquerque, NM)
Jim Davis (Chief, Surface Water Quality Bureau, NMED)
Scott Brown (Assistant Director, NMGF)
Jack Kelly (Chief, Fisheries Division, NMGF)
Bill Hays (CSD, Assistant Chief for Habitat, NMGF)
Chuck Hayes (CSD, Assistant Chief for T&E Species, NMGF)
David Propst (Endangered Fish Biologist, NMGF)
Marc Wethington (San Juan Fisheries Biologist, NMGF)
Nic Medley (Aquatic Habitat Biologist, NMGF)