

Department of the Interior
U.S. Fish and Wildlife Service

FINDING OF NO SIGNIFICANT IMPACT
FOR
A SECRETARIAL DECISION TO APPROVE DEPARTMENT OF THE INTERIOR PARTICIPATION
IN THE
SAN JUAN BASIN RECOVERY IMPLEMENTATION PROGRAM

The Secretary of the Interior (Secretary) is requested to approve Department of the Interior participation in a Federal/State/tribal/private Recovery Implementation Program for endangered fish species in the San Juan River Basin. The U.S. Fish and Wildlife Service has prepared the attached programmatic environmental assessment (EA) to provide an analysis and assessment of impacts to the environment from program implementation.

Based upon the information in the EA, it has been determined that a Secretarial decision to approve Department of the Interior participation in the Recovery Implementation Program does not constitute a major Federal action having a significant impact on the environment. Actions and impacts were evaluated using the best available data and assumptions.

The Secretary's approval of Department of the Interior participation in the Implementation Program would not result in impacts differing in scope or effect than those already approved through the October 1991 Biological Opinion for the proposed Animas-La Plata Project.

Additional, site specific environmental analysis and documentation will be conducted prior to implementation of individual projects or actions identified through the Recovery Implementation Program.



Regional Director Region 2

23 Oct 1992

Date

SUMMARY

The U.S. Fish and Wildlife Service (Service), under the authority of the Endangered Species Act of 1973, as amended, proposes to participate in the San Juan River Basin Recovery Implementation Program (Implementation Program). This Implementation Program is a cooperative effort by the Service, the Bureau of Reclamation, Bureau of Indian Affairs, the States of Colorado, New Mexico, and Utah, the Ute Mountain Ute Indian Tribe, the Southern Ute Indian Tribe, the Jicarilla Apache Indian Tribe, and the Navajo Nation.

The Implementation Program establishes a cooperative infrastructure to protect and recover endangered fishes in the San Juan River Basin (Basin) while water development proceeds in compliance with all applicable federal and state laws. Endangered species for which the Implementation Program has been formulated are the Colorado squawfish (Ptychocheilus lucius) and the razorback sucker (Xyrauchen texanus). It is anticipated that actions taken under this Implementation Program also will provide benefits to other native fishes in the Basin and prevent them from becoming endangered in the future.

There are two viable alternatives relating to this proposal. They are (1) No Action, and (2) the Implementation Program as discussed in the document entitled "San Juan River Basin Recovery Implementation Program." The Implementation Program was developed by the cooperating entities, with the resulting document representing the agreed upon commitments and method for determining proposed actions of the entities. Therefore, no subset of alternatives in addition to the proposed program in its entirety have been analyzed for this environmental assessment (EA). It is proposed that the Implementation Program will remain in place for 15 years and will include a combination of data gathering and research efforts concerning the endangered fish species, and, based upon the information obtained during those research efforts, proposed implementation of specific actions to effect the recovery of those endangered fish species. Because of the length of time dedicated to the Implementation Program and the speculative nature of potential impacts of as yet unidentified actions to be taken for the recovery, this EA will not address site or action specific impacts. Rather, it will provide overall analysis of the impacts, if any, of the Implementation Program as a whole, in comparison to the No Action alternative. Specific actions or developments proposed, if determined to be feasible and necessary to effect the recovery of the endangered fish species will be subject to compliance with the National Environmental Policy Act, Clean Water Act, Endangered Species Act, and all other applicable laws and regulations prior to implementation on an individual basis.

I. PURPOSE AND NEED FOR ACTION

A. PROPOSAL

The Service, through the Secretary of the Interior, proposes to enter into a cooperative program to identify the needs of the endangered fish of the San Juan River Basin, to address those needs in order to effect recovery of the endangered species, and to work with cooperating entities to provide the mechanisms through which water development in the Basin may proceed. The cooperators with the Service in this effort include the Bureau of Reclamation; the Bureau of Indian Affairs; the States of Colorado, New Mexico, and Utah; the Ute Mountain Indian Tribe; the Southern Ute Indian Tribe; the Jicarilla Apache Tribe; and the Navajo Nation.

Recent consultations under section 7 of the Endangered Species Act for two proposed projects, the Animas-La Plata Project (ALP), and the Navajo Indian Irrigation Project Blocks 1 through 8 (NIIP), found that current and cumulative adverse conditions of the San Juan River were likely to jeopardize the continued existence of the Colorado squawfish and razorback sucker. Impacts arising from water depletions, modifications to the natural hydrograph of the San Juan River, and degradation of water quality through the introduction of environmental contaminants from irrigation return flows, increased sediment, and temperature changes in the river's flows were identified. It was recognized that while these impacts may be exacerbated by continued development of the waters of the San Juan River, a program or plan is needed whereby all entities having the authority or opportunity to recover or protect the river environment are involved. The basis for such a program was established in the Biological Opinions issued by the Service on October 25, 1991, for ALP, and on October 28, 1991, for NIIP. Those documents provide additional information concerning the projects and this proposed Implementation Program and are incorporated herein by reference.

B. PURPOSE

The specific goals of the proposed Implementation Program are:

1. To conserve populations of the endangered Colorado squawfish (Ptychocheilus lucius) and razorback sucker (Xyrauchen texanus) in the Basin consistent with the recovery goals established under the Endangered Species Act, 16 U.S.C. 1531 et seq.
2. To proceed with water development in the Basin in compliance with federal and state laws, interstate compacts, Supreme Court decrees, and federal trust responsibilities to the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, the Jicarilla Apache Indian Tribe, and the Navajo Nation.

The Implementation Program identifies actions and objectives needed to attain these goals and to implement recovery of the endangered fish species within 15 years. It is the intent of the Implementation Program to develop a plan which will protect the needs of the endangered species of the San Juan Basin as part of a stable and diverse ecosystem, to provide the mechanisms for proceeding with water development in compliance with the Endangered Species Act, and to consider the impacts of all resource development on the endangered species.

C. PROPOSED AREA

The San Juan River and its tributaries form the second largest of the three sub-basins comprising the Upper Colorado River Basin (Figure 1). The San Juan River drains about 38,000 square miles of southwestern Colorado, northeastern Arizona,

northwestern New Mexico, and southeastern Utah. For a more detailed discussion of the area, the reader is referred to the Implementation Program document which is incorporated herein by reference.

D. INTERRELATIONSHIPS WITH OTHER PROJECTS OR PROPOSALS

This Implementation Program has been formulated to provide the cooperative infrastructure through which the numerous activities ongoing and proposed for the San Juan River Basin with potential to impact the endangered fish species may be incorporated to facilitate the analysis of impacts while protection of the endangered fish proceeds. Other activities include, but are not limited to, the U.S. Corps of Engineers' permitting responsibilities for dredge and fill activities in waters of the United States through section 404 of the Clean Water Act, each respective state and tribal resource agency's responsibilities for management and protection of resident fish and wildlife resources, and other federal, state, and tribal land management entities with responsibilities within the Basin.

II. ALTERNATIVES

A. NO ACTION

Under a No Action alternative, the seven-year research program now underway would continue as a condition of the reasonable and prudent alternative of the Biological Opinion for ALP; the analysis by the Bureau of Reclamation of the reoperation of Navajo Dam to mimic the natural hydrograph of the San Juan River and provide releases from Navajo Dam for the benefit of the endangered fish species would continue; research required in the Biological Opinion for NIIP would also continue; federal agencies would still be required to comply with the requirements of the Endangered Species Act to insure that actions they propose to authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the adverse modification or destruction of critical habitat for listed species. The state and tribal resource agencies would still work to protect the resources under their respective jurisdictions and authorities. The major difference between the No Action alternative and the Implementation Program is that the preferred alternative adds a coordinated effort by all entities to support an integrated program. Without this coordinated effort, information gained through various research efforts may not be as easily disseminated; repetition of some investigations and the resultant waste of effort and funds through such repetition may result. Impacts to aquatic resources, most notably the endangered fish species and the remaining fish fauna of the San Juan River through repeated and uncoordinated sampling efforts, would also be felt.

Because there is no quantitative difference in the research effort between the alternatives, the manipulation of water releases from Navajo Dam will be the same under the No Action or the Preferred Alternative. Therefore, they are addressed in discussion of the latter. The No Action alternative sets the environmental baseline (i.e., the affected environment) for comparison of the effects of the preferred alternative. The environmental effects (changes from present baseline conditions) reflect the identified major issues and other key elements of the environment.

B. SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM (PREFERRED ALTERNATIVE)

This alternative would put into effect the cooperative Implementation Program by participating state, federal, tribal, and private entities in the San Juan River Basin. Given the common goal of conserving endangered fish species and their habitats while resource development proceeds in the Basin, a comprehensive program is required to address both. Therefore, a broad range of measures will be considered to enable a cooperative effort to identify and quantify factors

which limit the abundance and survival of endangered fish species, to develop strategies to improve their status and means to evaluate the success of such endeavors, and to recover and delist the species under the authority of the Endangered Species Act.

Research efforts will be directed toward obtaining the information needed for identification of factors that might act to limit the recovery of the Colorado squawfish and razorback sucker. Based upon that information, an analysis of actions to remove or diminish such limiting factors and promote recovery will be accomplished. These actions will be considered, evaluated, consulted upon, and implemented if found to be necessary and effective. Such actions include but are not limited to habitat modification (e.g., flow or non-flow induced improvement of low velocity habitats or side channels), artificial control of non-native species, artificial propagation of native species for augmentation of existing natural populations and reintroduction into historic habitat, modification or removal of impediments to fish movement, and improvement in water quality. Concurrent with the research, and concomitantly with sufficient progress toward recovery, proposals for water and other resource development in the Basin will be considered and evaluated.

Federal actions that may affect an endangered species or adversely modify or destroy designated critical habitat will continue to require consultation under section 7 of the Endangered Species Act throughout the course of the Implementation Program. In analyzing proposed projects under consultation, the Service will determine if sufficient progress toward recovery has been made based on the best available biological data and professional judgement. The parameters upon which sufficient progress will be determined are the positive response of the endangered fish species (including but not limited to increased abundance, improved health, improved or increased survival) or improvement of their habitats (including but not limited to the availability, extent, or quality of those habitats).

III. AFFECTED ENVIRONMENT

Based on the perceived range of environmental impacts resulting from the proposed implementation of the preferred alternative, this EA incorporates as its analysis area the immediate environs of the San Juan River and its permanent and ephemeral tributaries from Navajo Dam downstream to Lake Powell.

A. CLIMATE, AIR QUALITY, GEOLOGY, AND SOILS

The San Juan Basin is typical basin and range topography with deep canyons, dry washes, upland mesas, and hogback ridges with igneous dikes. Soils are derived from sandstones, clays, and barren shales containing little organic matter. This area is classified as the Navajo section of the Colorado Plateau physiographic province (Finneman 1931). Elevation within the basin varies from 1460 to 2100 meters (4790-6890 feet).

The climate and vegetation of the San Juan Basin is characteristic of the Great Basin, a cold-temperature desertland. The Great Basin has cold, harsh winters, low precipitation scattered throughout the year, with great extremes in both daily and seasonal temperatures (Brown 1982). Mean annual precipitation at Aztec, New Mexico is 242 mm or 9.53 inches. Winter precipitation is dominant (more than 50 percent of the total precipitation falls during winter months), although the Chihuahuan desert monsoon provides warm weather moisture during summer months (Cully et al. 1987).

B. WATER

The San Juan River sub-basin is the second largest of the three sub-basins which comprise the Upper Colorado River basin. The San Juan River sub-basin drains about 38,000 square miles of southwestern Colorado, northeastern Arizona,

northwestern New Mexico, and southeastern Utah. From its origins in the San Juan Mountains of Colorado, the San Juan River flows some 31 miles to the New Mexico border, 190 miles westward to the Four Corners area, and thence another 136 miles to Lake Powell. In its upper reaches, the river traverses rugged terrain and has a relatively high gradient. The river emerges from canyon-bound reaches shortly after entering New Mexico and flows through a broad floodplain for much of its course in New Mexico and Utah. About 70 miles upstream of Lake Powell, the river again enters canyon reaches for the remainder of its course. The river is generally restricted to a single channel in canyon portions, but is often divided into several channels in floodplain reaches.

The San Juan River has comparatively few perennial tributaries, most of which are in upper reaches. Historically, the Pinos, Piedra, Navajo, Animas, La Plata, and Mancos rivers, Rio Blanco, and McElmo Creek were the only perennially flowing tributaries. Other streams such as Montezuma and Chinle creeks seasonally contributed flows. Numerous washes and arroyos also entered the river, but none provided regular flow. Among tributaries, the Animas River contributed the greatest flow.

C. VEGETATION

The vegetation of the San Juan Basin is typical of the Great Basin biotic province and is comprised of four general types of plant habitats: riparian wetland, desertscrub, desert grassland, and conifer woodland.

The riparian corridors are relatively narrow, confined to the river banks and disjunct throughout the course of the San Juan River as it traverses the analysis area. Tributaries to the San Juan River support varying degrees of intact riparian communities. The riparian plant community is dominated by Rio Grande cottonwood (Populus fremontii), and narrowleaf cottonwood (P. angustifolia); peachleaf willow (Salix amygdaloides) and scrub willow (S. exigua); Russian olive (Elaeagnus angustifolia); saltcedar (Tamarix sp.); and common reed (Phragmites australis).

Xeric lowlands and upland sites in the region are occupied by the Great Basin desertscrub community. The following taxa are indicative of this community: shadscale (Atriplex confertifolia) and broadscale (A. obovata); big sagebrush (Artemisia tridentata), Bigelow sagebrush (A. bigelovii), sand sagebrush (A. filifolia), black sagebrush (A. arbuscula spp. nova), Parry sagebrush (A. parryi), and bud sagebrush (A. spinescens); fivehook bassia (Bassia hyssopifolia); three-leaf snakeweed (Gutierrezia microcephala) and broom snakeweed (G. sarothrae); winterfat (Eurotia lanata); tanglebrush (Forestiera neomexicana); tumbleweed (Salsola iberica and S. kali); greasewood (Sarcobatus vermiculatus); rabbitbrush (Chrysothamnus nauseosus); galleta grass (Hilaria jamesii); whipple cholla (Opuntia whipplei); pediocactus (Pediocactus spp. sclerocactus (Sclerocactus spp.)); and gray horsebrush (Tetradymia canescens).

The Great Basin desert grasslands and Plains grasslands communities intergrade and form transitional areas in northwestern and central New Mexico, southern Utah, northern Arizona, and southcentral and western Colorado (Brown 1982). Because these two communities overlap, they will be referred to herein as the grasslands community. Much of this general community has been converted to irrigated cropland. Extensive over-grazing and fire suppression have led to shrub invasion of grassland habitats. The following species are characteristic of the grassland community found in the analysis area for this assessment: western wheatgrass (Agropyron smithii); little bluestem (Andropogon scoparius); prickly poppy (Argemone spp.); asters (Aster spp.); sideoats grama (Bouteloua curtipendula), black grama (B. eriopoda), blue grama (B. gracilis), and hairy grama (B. hirsuta); buffalo grass (Buchloe dactyloides); thistles (Cirsium spp.); plains lovegrass (Eragrostis intermedia); Arizona fescue (Fescue arizonica); galleta (H. jamesii); one-seed juniper (Juniperus monosperma); Wright fishhook cactus (Mammillaria wrightii); four o'clock (Mirabilis spp.); evening primrose

(Oenothera spp.); club cholla (O. clavata) and tree cholla (O. imbricata); vine mesquite grass (Panicum obtusum) mallows (Sphaeralcea spp.); sand dropseed (Sporobolus cryptandrus); needle and thread grass (Stipa comata); goldeneye (Viguiera spp.); and soapweed (Yucca glauca).

The conifer woodland community occupies mesic upland sites (5000 to 7000 feet) in the San Juan Basin. The grassland community often occurs together with the conifer woodland community. The following species are indicative of the conifer woodland community type: serviceberry (Amelanchier spp.); Fremont mahonia (Berberis fremontii) and red mahonia (B. haematocarpa); sego-lily (Calochortus nuttallii); alderleaf mountain-mahogany (Cercocarpus montanus); cliffrose (Cowania spp.); mountain joint-fir (Ephedra viridis); apache plume (Fallugia paradoxa); gilia (Gilia spp.); lupines (Lupinus spp.); muhlies (Muhlenbergia spp.); mohave prickly pear (O. erinacea); beardtongue (Penstemon spp.); pinyon pine (Pinus edulis), Mexican pine (P. cembroides); antelope brittlebrush (Purshia tridentata); Emory oak (Quercus emoryii), Gambel oak (Q. gambelii); gray oak (Q. grisea), and shrub live oak (Q. turbinella); buckthorn (Rhamnus spp.); buffaloberry (Shepherdia spp.); scarlet globemallow (Sphaeralcea coccinea); snowberry (Symphoricarpos spp.); and banana yucca (Yucca baccata).

D. WILDLIFE

Aquatic Resources

Historically, the San Juan River and its tributaries supported a native fish community of at least eight and possibly nine species: cutthroat trout (Oncorhynchus clarki ssp.), roundtail chub (Gila robusta), Colorado squawfish (Ptychocheilus lucius), speckled dace (Rhinichthys osculus), flannelmouth sucker (Catostomus latipinnis), bluehead sucker (C. discobolus), razorback sucker (Xyrauchen texanus), and mottled sculpin (Cottus bairdi). Based on two specimens and skeletal remains in Native American middens, bonytail chub (Gila elegans) may also have inhabited the river. Twenty-three non-native fish species have been reported in the San Juan River. In warmwater reaches of the mainstem San Juan River, common carp (Cyprinus carpio) and channel catfish (Ictalurus punctatus) are common and generally distributed. Rainbow trout (Oncorhynchus mykiss), cutthroat trout (O. clarki), and brown trout (Salmo trutta) are common non-natives in the coldwater reaches of the San Juan River (including the blue ribbon trout fishery in the Navajo Dam tailwater reach and supported by cold water releases from the reservoir) and its upper tributaries. Red shiner (Cyprinella lutrensis), fathead minnow (Pimephales promelas), and mosquitofish (Gambusia affinis) are the most common non-native species found in low-velocity habitats associated with the mainstem San Juan River.

Terrestrial Resources

The variety in topography and diversity of vegetative communities within the San Juan Basin provide habitats for a broad assemblage of terrestrial species. These include Rocky Mountain elk (Cervus elaphus) and mule deer (Odocoileus hemionus) as primary big game mammals in certain portions of the basin and such predators and furbearers as coyote (Canis latrans), gray fox (Urocyon cinereoargenteus), kit fox (Vulpes macrotis), mountain lion (Felis concolor), bobcat (Lynx rufus), striped skunk (Mephitis mephitis), western spotted skunk (Spilogale gracilis) badger (Taxidea taxus), and raccoon (Procyon lotor).

A wide variety of both migratory and resident bird species are known from the San Juan Basin. These include raptors such as the bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus), golden eagle (Aquila chrysaetos), ferruginous hawk (Buteo regalis), red-tailed hawk (B. jamaicensis), and osprey (Pandion haliaetus). Species of shorebirds documented in the San Juan River Valley include the great blue heron (Ardea herodias), black-crowned night heron (Nycticorax nycticorax), killdeer (Charadrius vociferus), and black-necked stilt (Himantopus mexicanus). The San Juan River provides wintering and nesting

habitat for migratory waterfowl. Most noticeable of these are the Canada geese (Branta canadensis) utilizing the croplands adjacent to the San Juan River in the vicinity of Farmington. Concentrations of this species in the river valley fluctuate depending upon food availability and weather conditions.

For a more detailed listing of the basin's avifauna, the reader is referred to Hubbard (1978).

Threatened Or Endangered Species

Species of both plants and animals that have been federally listed under the Endangered Species Act of 1973, as amended, may occur within the general area of this analysis. These include the threatened Mesa Verde cactus (Sclerocactus mesae-verdae), and endangered mancos Milkvetch (Astragalus humillimus), peregrine falcon, bald eagle, Colorado squawfish, and razorback sucker.

The Mesa Verde cactus was listed as threatened on October 30, 1979. Threats to the cactus are principally collection of plants by commercial and private collectors and destruction or modification of its habitat through surface disturbance from energy development and unregulated off-road vehicle use. Application of agricultural herbicides and pesticides may also harm the species and its pollinators. Mesa Verde cactus is known from only five isolated populations of northwestern New Mexico and southwestern Colorado. Three of the New Mexico populations occur on the Navajo Indian Reservation.

The Mancos milkvetch was listed as an endangered species on June 27, 1985. The species is known only from northwestern New Mexico and extreme southwestern Colorado. It is most commonly found in scattered populations between the town of Towaoc, Colorado, and the Chaco River in New Mexico. The primary threats to the plant are habitat destruction through surface disturbance associated with energy development and conversion to other uses such as road and utility rights-of-way, and by illegal collecting. Agricultural pesticides may affect the pollinators of the milkvetch. Twelve of the thirteen extant populations are primarily on lands of the Navajo Nation and Ute Mountain Ute Tribe.

The bald eagle was listed on February 14, 1978, as endangered in the conterminous United States, except for Washington, Oregon, Minnesota, Wisconsin, and Michigan, where its status is threatened. The reasons for its decline and subsequent listing included chemical contamination, chiefly by organochlorine pesticides, causing severe population declines and local extirpation throughout the species' range, through reproductive failure and direct toxicity; other contributing factors included degradation and loss of habitat, killing, and human disturbance.

Bald eagles enter New Mexico in October and November and leave in March or early April. While in the state, most tend to congregate around reservoirs and other sizeable bodies of water, including larger rivers such as the San Juan. The predominantly piscivorous bald eagle utilizes fish and waterfowl for up to 90 percent of its diet. Since wintering bald eagle surveys were initiated by the New Mexico Department of Game and Fish in 1982, a gradual upward trend in abundance has been observed. Mirroring the state-wide trend, abundance of bald eagles wintering along the San Juan River and around Navajo Reservoir have also increased. Recent findings of contaminants in the San Juan River and in areas adjacent to the river have focused attention on the concerns of heavy metal, hydrocarbon, and selenium contamination and subsequent impacts upon the predatory and scavenging bald eagle.

The peregrine falcon was listed as endangered in 1970 because of pesticide-induced reproductive failure. Peregrine falcons feed almost exclusively on birds; pigeons, medium-sized passerines, shorebirds, and medium to small waterfowl. Although no peregrine aeries are currently known within the San Juan River Valley affected by the proposed action, the species may utilize the area during migration and prey upon avian species feeding along the river or its

adjacent floodplain.

The Colorado squawfish was listed as endangered on March 11, 1967. Habitat alteration, fragmentation, and degradation arising from dam construction; and competition and predation from introduced non-native fishes have been cited as the major factors responsible for the decline of the species. As a top level predator, the Colorado squawfish may experience bioaccumulation of contaminants from its prey.

Endemic to the Colorado River basin, the squawfish has historically been found in the San Juan and Animas rivers. Recent collections have yielded a total of 18 young-of-the-year squawfish in backwaters of the San Juan River at various locations downstream of Shiprock, New Mexico. In 1991, four adults were captured downstream of Shiprock and one was observed in the river between the Hogback and Shiprock. The rediscovery of adult Colorado squawfish, presence of several age classes, and documentation of its successful spawning in the San Juan River reconfirmed the species as a viable component of the ichthyofauna of the San Juan River.

The razorback sucker was listed as endangered on October 23, 1991. Causes for the decline of the sucker have been identified as fragmentation of its habitat by the construction of dams, the manipulation of flows with attendant alterations of temperature and water quality, and the introduction of non-native fishes. Once abundant throughout the mainstem of the Colorado River and its major tributaries, the species now occupies only an estimated 25 percent of its historic range, and where it does occur, its numbers are extremely low. In 1988, a single reproductively mature male razorback sucker was captured in the San Juan River near Bluff, Utah.

E. ARCHEOLOGICAL AND HISTORIC RESOURCES

The San Juan Basin contains cultural resources of major significance spanning from the PaleoIndians (10,000-5,000 BC) to the present. No known archeological sites will be impacted by the implementation of the preferred alternative now under analysis.

F. LAND USE AND SOCIOECONOMIC RESOURCES

The economic base of the general area included in this environmental analysis is primarily derived from agriculture (crop and livestock production) and mining. Until 1950, the area immediately surrounding Farmington, New Mexico, was known primarily for the extensive annual fruit crop (apples, pears, peaches) and for extensive cattle and sheep production. In that year, large-scale oil and natural gas development began in the San Juan Basin. Coal development in the area has been the foundation for the construction of electric generating stations west of Farmington (Public Service Company of New Mexico's San Juan Generating Plant with a net capacity of 1,723 megawatts and the Arizona Public Service Company's 2,040-megawatt Four Corners Power Plant).

IV. ENVIRONMENTAL CONSEQUENCES

It is anticipated that the research begun under the Biological Opinion for Animas-La Plata may have impacts caused by the temporary alteration of the flows from Navajo Dam to mimic the natural hydrograph. These impacts are anticipated not only to be limited to the 7-year duration of the research but will vary according to the flows released in any given year during the research period. The Implementation Program is simply a coordination effort and commitment by the participants to work cooperatively to develop information which would allow Navajo Dam to be operated in a manner which is beneficial to the endangered fish species. Because the test flows are within current standard operating criteria (maintaining minimum and maximum releases) of Navajo Dam, no significant new

action is being proposed and no decision is being made in the Implementation Program.

Prior to the construction of Navajo Dam, the hydrograph of the San Juan River was characterized by large spring peaks and low base flow. Typically, spring runoff began in March, peaked in mid-May to early June and ended by the first week of July. During the remainder of the year, flow was characteristically low, punctuated by large, short duration peaks caused by summer and fall storm events.

Since the completion of Navajo Dam in 1962, flows below Navajo Reservoir have been largely controlled and stabilized. Spring peak flows have been significantly reduced in magnitude, base flows have been increased and stabilized, and late winter flows have increased markedly to provide storage space in the reservoir for the spring runoff. In addition to moderating natural flows, hypolimnetic releases from Navajo Reservoir have decreased mean annual water temperature and diminished temperature fluctuations of the San Juan River downstream to near the confluence of the Animas River.

In addition to the commitment to provide releases from Navajo Dam to support research resulting from the Biological Opinion for the proposed Animas-La Plata Project, the Bureau of Reclamation has also requested initiation of formal section 7 consultation on the operation of Navajo Dam (July 30, 1991). In order to obtain and provide information needed for a Biological Opinion that would result from this consultation, the Bureau of Reclamation also committed to release flows for research purposes. The Bureau of Reclamation has determined that changes within the existing operational criteria for the purposes of collecting information necessary for a Biological Opinion can be implemented under existing authorities, providing existing standard operating criteria are met, and as provided pursuant to sections 7(a)(1) and 7(a)(2) of the Endangered Species Act. At the end of the research period, and following the issuance and acceptance of a Biological Opinion for Navajo Dam reoperation, the Bureau of Reclamation has stated its intention of producing the necessary documents to comply with NEPA (Draft Supplement to the 1980 Final Environmental Impact Statement for the Animas-La Plata Project, October 1992).

To support the necessary research of the effects of flows on the endangered fish species, the Bureau of Reclamation will operate Navajo Dam so that releases mimic a natural hydrograph. Test flows will be provided to re-create a wide range of flow conditions including high flows similar to 1987, which are hypothesized to benefit reproduction and recruitment in the endangered fish community. Release schedules will meet the limitations on the outlet works facilities and safe routing of hydrological events in the Upper Colorado River Basin. The normal operating criteria for Navajo Dam allows releases not to exceed 5000 cubic feet per second (cfs). Releases for the Implementation Program research will not exceed this amount. However, in recent years, when high releases were not made, some encroachment by vegetation on the channel has caused modification of the channel. High releases may alter the vegetation community on a temporary basis. Additionally, Canada geese have increased in their winter and nesting use of the San Juan River and private lands in the vicinity of Farmington, New Mexico. Concerns were raised during high releases in 1992 regarding the loss of nests and eggs of the geese. Without some accommodation such as disturbance of the geese prior to nesting to keep them out of the river channel, losses of an unknown quantity of nests and eggs are expected to continue during high flows. Such flows, however, are within the normal operation of the dam and may be caused by releases made for other purposes than the research, i.e., evacuation of space in Navajo Reservoir to accommodate high spring runoff. It has been agreed by the Bureau of Reclamation, the Fish and Wildlife Service, and other entities involved in the research effort, to coordinate closely with land owners to reduce any future impacts to the Canada geese through early notification of anticipated flows each year to provide opportunities to remove the birds from the floodplain.

The releases from Navajo Dam may also affect the efficient operation of the City of Farmington's hydroelectric generation plant installed in the dam in 1979. The conditions of the permit to allow the construction and operation of the power plant specified that it was to operate on the flows released; however, high flows, in excess of 1800 cfs cause a decrease in power output from the plant. The design configuration of the point where the power plant penstock connects with the main outlet piping of the dam causes a decrease in hydraulic head and adversely affects power production. Redesigning the connection is considered too costly by the City of Farmington. Therefore, a proposal to modify the Navajo Hydroelectric Plant Operating Agreement has been submitted for comment to the Federal Regulatory Commission, and review by the Fish and Wildlife Service and New Mexico Department of Game and Fish. That modification is proposed in an effort to remediate reduced output from the power plant when releases in excess of 1800 cfs are discharged. This modification would release up to 1700 cfs through the auxiliary outlet gate after flows have reached 1800 cfs (600 cfs through the main outlet works plus 1200 cfs through the power plant). This practice would allow total release of up to 3500 cfs with no effect on power production. The Bureau of Reclamation would manually open the gates to regulate any flow requirements above 3500 cfs.

The manipulation of flows to support the research effort will not affect the threatened Mesa Verde cactus or the endangered Mancos milkvetch because the plants are not within the immediate area that could be affected by higher flows. The endangered bald eagle may be benefitted by the provision of prey should waterfowl or fish species be made more available by the relatively short term high flows. No effects are expected on the peregrine falcon. Significant benefits are expected for the Colorado squawfish and the razorback sucker, and for the remaining members of the river's native fish community by the commitment to return the San Juan River to a more natural hydrograph. Non-native fish species may be adversely impacted by the more natural conditions.

Modifications of the flows of the San Juan River during the research period are not expected to result in discernible impacts to the rafting and canoeing recreation activities dependent on the river. Quantifying the temporary impacts is not considered feasible due to the yearly variation of releases, based on water yield and research needs, throughout the research effort. At the end of the approximately 7-year research period, the Bureau of Reclamation has committed to operating Navajo Dam to mimic a natural hydrograph for the life of the ALP based on the research. At that time, the impacts of such permanent operation of Navajo Dam and Reservoir on the river and its users should be examined.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed action is not expected to result in irreversible and irretrievable commitment of resources. Should any action to be taken based on the research in order to facilitate the recovery of the endangered fish species, that individual action will be analyzed for such commitment of resources. Any known irreversible or irretrievable commitment of resources and the significance of the potential site- or action-specific impacts will be assessed at that time.

VII. CONSULTATION AND COORDINATION

The San Juan River Basin Recovery Implementation Program has been coordinated with a variety of state, federal, tribal agencies, and private groups and individuals. The Program itself is the result of year-long coordination meetings and interagency drafting efforts undertaken to resolve conflicts and receive comments and input at all stages of its formulation.

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