

BLM



IN REPLY REFER TO

# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
VERNAL DISTRICT OFFICE  
170 South 500 East  
Vernal, Utah 84078



FEB 24 1982 March 2, 1982

Dear Interested Citizen:

On November 26, 1980, a draft environmental impact statement was circulated that discussed the threatened, endangered, and sensitive species in the White River Dam Project impact area. That discussion disclosed that the Section 7 consultation (biological opinion procedure) with the U S Fish and Wildlife Service would continue through the 1981 field study period in order that more data on the endangered fish species could be collected for the biological opinion. This would allow for a more thorough environmental analysis in the final environmental impact statement. Because the biological opinion was not available for public review in the draft environmental impact statement, the BLM is making it available now for your review in advance of receiving a copy of the final environmental impact statement.

Enclosed is your copy of the White River Dam Biological Opinion. Additional copies of the opinion can be obtained from the BLM Vernal District Office, 170 South 500 East, Vernal, Utah 84078 (or phone Lloyd Ferguson, District Manager or Curtis Tucker, Environmental Specialist at (801) 789-1362), or from the BLM Utah State Office, 136 East South Temple, Salt Lake City, Utah 84111 (or phone Thom Slater at (801) 524-5645).

BLM will accept all comments on the biological opinion. However, to be published in the final environmental impact statement on the proposed White River Dam, comments on the biological opinion must be provided to BLM by April 15, 1982. Such comments should be sent in writing to Lloyd Ferguson, BLM Vernal District Manager, at the above address. Any other comments received subsequent to April 15, 1982, will not be published in the EIS but will be considered in the decision making process scheduled for early summer of 1982.

Sincerely,

*Lloyd H. Ferguson*  
District Manager

Enclosures: 1  
Biological Opinion

NEPA COLLECTION  
Transportation Library  
Northwestern University Library

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**Evanston, IL 60201**



United States Department of the Interior  
FISH AND WILDLIFE SERVICE

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134 Union Blvd.  
Lakewood, Colorado 80228

REPLY REFER TO:

A/SE/BLM-White  
White River Dam (6-5-80-F-222)

FEB 24 1982

MEMORANDUM

To: State Director, Utah State Office  
Bureau of Land Management, Salt Lake City, Utah

From: Acting Regional Director, Region 6  
Fish and Wildlife Service, Denver, Colorado

Subject: Biological Opinion - White River Dam Project, Utah

We prepared this biological opinion in response to your February 29, 1980, request for consultation as well as your August 13, 1980, request for an extension of the consultation period for the White River Dam Project (WRDP) proposed for construction south of Bonanza, Utah. The Utah State Division of Water Resources (DOWR) proposes to construct the project largely on land administered by the Bureau of Land Management (BLM). BLM's issuance of appropriate rights-of-way is required.

This opinion has been prepared as prescribed in the Section 7 Interagency Cooperation Regulations, 50 CFR 402, and the Endangered Species Act (ESA), 16 USC 16 et seq. Data sources and information referenced herein are part of the administrative record of this opinion and are located in the U.S. Fish and Wildlife Service's (FWS) Salt Lake City Area Office.

BIOLOGICAL OPINION

Operation of the WRDP as described below, which includes conservation measures designed to aid in the survival and recovery of the Colorado squawfish (Ptychocheilus lucius), is not likely to jeopardize the continued existence of the bald eagle (Haliaeetus leucocephalus), peregrine falcon (Falco peregrinus anatum), Uintah Basin hookless cactus (Sclerocactus glaucus), humpback chub (Gila cypha), bonytail chub (Gila elegans), or the Colorado squawfish.

PROJECT DESCRIPTION

The DOWR proposes to construct and operate a dam and reservoir on the White River southwest of Bonanza in Uintah County, Utah.

The reservoir would be about 13.5 miles long (maximum width of 0.7 miles) and would inundate 1,980 surface acres when filled to capacity. The reservoir would have an active storage capacity of 70,700 acre-feet (af) and a sediment reserve capacity of 38,550 af, for a total of 109,250 af. The dam, located on the White River about 50 miles upstream from the confluence of the Green and White Rivers, would be constructed of earth- and rock-fill materials and would be approximately 129.5 feet high and 2,700 feet long. A 15-megawatt hydroelectric plant would be constructed near the downstream toe of the dam. An estimated 29 million kilowatt hours would be generated from the plant on an average annual basis. A 138-kilovolt power transmission line would transmit power from the hydroelectric plant to the Moon Lake Bonanza power plant. This route would be about 10.5 miles long and 60 feet wide and would require approximately 77 acres of right-of-way.

The primary project purpose is to provide water for energy development, principally related to oil shale development and thermal power. Water rights would be retained by the State of Utah and made available for purchase. The potential users would build their own pumping stations and delivery systems. Approximately 75,000 af (104 cubic feet per second (cfs)) of water is being considered for sale to known users. The average annual evaporation loss from the reservoir would be approximately 5,500 acre-feet. This would result in a total of 80,500 af (111 cfs) of water being taken from the White River annually. The State of Utah has filed to appropriate a maximum of 250,000 af (345 cfs, approximately one half of the annual yield of the White River) of water from the White River. Conceivably this volume of water could ultimately be consumed yearly. However, since only approximately 80,500 af per year (111 cfs) is the expected depletion at this time, it is this volume which will be considered in this opinion. In addition, the 80,500 af (111 cfs) volume is the level which BLM is assessing in its final Environmental Impact Statement (EIS).

Minimum releases at the dam are expected to be 250 cfs (181,000 af) except in extremely dry years. This release is for power generation and downstream requirements of Tosco Oil Shale Company and the Uintah-Ouray Indian Reservation. A minimum release of 50 cfs (36,200 af) would bypass the Indian diversion which is about 15 to 20 miles above the confluence with the Green River. In most years, releases are expected to exceed this amount by approximately 100 to 300 cfs (72,400 to 217,200 af).

The only action discussed in this biological opinion is the applicant's proposed project. The draft EIS (DEIS) prepared by BLM discusses four alternatives to the White River dam and reservoir. If one of the alternatives other than the proposal addressed in this opinion is selected, Section 7 consultation should be reinitiated. Additionally, should information

become available in the future which was not available at the time of this consultation and which may show additional adverse impacts to listed species that was not considered in this biological opinion, Section 7 consultation should be reinitiated.

#### PROJECT IMPACTS TO THE AQUATIC ENVIRONMENT

The White River near the Colorado-Utah State line (Watson gage) had an average annual discharge of 502,800 af (695 cfs) during the period 1923-1978. The lowest annual flow of record was 223,000 af (308 cfs) in 1977. Mean monthly flows in the late spring (peak flows) range from approximately 724,000 to 1,448,000 af (1,000 to 2,000 cfs).

Based upon flow information that was provided by the applicant and modeled by the FWS Instream Flow Group, the project would reduce flows of the White River, as indicated by percent of flow reduction, at two locations below the dam during June, July, August, and September (critical months for squawfish reproduction and rearing) in the following chart:

	<u>Green River Confluence</u>		<u>Below Dam To Mtn. Fuel Bridge*</u>	
	Mean <sup>1</sup> Monthly flow (cfs)	% flow <sup>2</sup> reduction	Mean Monthly flow (cfs)	% flow reduction
June	1564	13%	1717	5%
July	448	28%	586	9%
August	197	45%	333	14%
September	228	40%	303	12%

<sup>1</sup>Based upon the period from 1960-1980

<sup>2</sup>These figures are based upon the dam being operated between 250 and 2000 cfs with full downstream use (as outlined in the BLM DEIS).

\*Mountain Fuel Bridge - In the White River 21.3 miles from the confluence of the Green River.

During the period between 1963 and 1978 (after the closure of Flaming Gorge Dam) the Green River near Green River, Utah, had an average annual flow of 3,990,688 af (5512 cfs). This location near Green River, Utah is 120 miles up the Green River from its confluence with the Colorado River. The lowest annual flow during this period was 1,662,600 af (2,300 cfs) in 1963 and the highest was 5,388,300 af (7,429 cfs) in 1973. The lowest monthly flow was 47,500 af (66 cfs) recorded in October 1964.

Based upon flow and release information that was provided by the applicant, and modeled by the FWS Instream Flow Group, the project would reduce flows of the Green River (directly below the confluence of White and Green Rivers) during June, July, August, and September by:

	Mean (cfs) <sup>1</sup> Monthly Flow	% flow reduction <sup>2</sup>
June	12,297	2%
July	5,052	4%
August	3,138	5%
September	2,683	5%

<sup>1</sup>Based upon period from 1964-1979

<sup>2</sup>Based upon the dam being operated between 250 and 2000 cfs with full downstream White River use.

Table 1 and Table 2 present information on the predicted changes in mean monthly temperatures in degrees centigrade (°C) at certain projected flows (in cfs) for various locations on the Green and White Rivers for the months of May, June, July, and August, as a result of the operation of the proposed White River dam. These locations include the Watson gage which is near the Colorado-Utah State line, the Mountain Fuel bridge which is 21.3 miles from the confluence of the Green river and the mouth of the White River. The tables show that WRDP can be operated in a manner which will not significantly alter the temperature regime below the proposed dam. Therefore, water temperature changes that result from the proposed dam can be regulated in a way that should not affect a suspected spawning area located 15 miles below the proposed dam. The flows shown are based upon various operating conditions of the White River dam.

Table 1. Expected changes in temperature (°C) at three locations on the White River at various flows (cfs).

	Flow	Temp. at Watson	Temp. at Mtn. Fuel	Temp. at Mouth
Mean (present)	1273	11.2	13.6	14.4
May	1987	18.3	17.8	17.6
	1490	18.3	17.6	17.4
	993	18.3	17.3	17.1
	2484	18.3	17.9	17.7
	Mean (present)	1800	15.3	16.9
June	596	18.3	19.2	19.3
	397	18.3	19.3	19.4
	298	18.3	19.3	19.4
	795	18.3	19.1	19.3
Mean (present)	970	20.1	21.5	21.9

July	397	18.3	21.9	22.2
	298	18.3	22.1	22.2
	198	18.3	22.2	22.3
	596	18.3	21.5	21.9
Mean (present)	465	18.9	20.4	20.6
August	298	18.3	20.5	20.7
	198	18.3	20.6	20.7
	99	18.3	20.6	20.7
	496	18.3	20.3	20.5

Table 2. Expected changes in temperature ( $^{\circ}\text{C}$ ) at Green River, Utah at various flows (cfs).

	Flow	Temp. at Green River, Utah
Mean (present)	11,382	13.2
May	12,096	13.8
	11,599	13.6
	11,102	13.4
	12,592	13.9
Mean (present)	13,193	16.7
June	11,989	16.7
	11,790	16.6
	11,691	16.6
	12,188	16.7
Mean (present)	7,271	21.1
July	6,699	21.1
	6,599	21.1
	6,500	21.1
	6,897	21.1
Mean (present)	3,526	19.9
August	3,359	19.9
	3,259	19.9
	3,160	19.9
	3,557	19.9

Annual sediment yield of the White River at its confluence with the Green River would be reduced an average of 55.5 percent. This would cause an average annual reduction in silt load of the Green River at the town of Green River, Utah, of 10.2 percent. This will probably have a beneficial effect on the suspected spawning area mentioned earlier. Releases from the dam would be nearly sediment-free for several years (Clyde 1980). Construction and operation of the dam would modify downstream channel morphology in the White River over a period of years.

It is estimated that the proposed project would result in an increase of salinity of 3.4 milligrams per liter (mg/l) downstream at Imperial Dam, California (Clinton 1980). The preferred concentrations of squawfish range between 600 and 1100 mg/l. Laboratory studies indicate that

squawfish completely avoid concentrations greater than 4400 mg/l. Therefore, this increase will not adversely affect the fishes. Projections of other downstream water quality characteristics as a result of the dam are uncertain.

Both the Green and Colorado Rivers have experienced significant peak flow reductions due to existing reservoir operation and an overall depletion in water for various purposes. Peak flow levels, magnitude, and duration primarily determine river morphology and habitat conditions. Peak flows have been drastically reduced in the Colorado River system resulting in sediment buildup in certain areas, water temperature changes, and other chemical changes in the River system (FWS 1982). The proposed White River dam would change the peak flow regime of the White River during spring runoff by greatly reducing the amount of water reaching the Green River during this time period. This will further add to the chemical and physical changes occurring in the Green River.

To increase knowledge of the Colorado River endemic (primarily the listed species) fishes' habitat requirements, a Colorado River Fishes Investigation Team was established in April 1979. This team is staffed with FWS personnel and received funding from the FWS, BLM, and the Bureau of Reclamation (BR). Other participants were the Utah Division of Wildlife Resources (DWR) and the Colorado Division of Wildlife. The major objective of the team's study was to learn additional life history requirements of the listed fishes. Under our funding agreement with BR and BLM, most of the field work was in the Colorado River system where impacts from BR and BLM projects were the greatest. Information obtained during the study via field, laboratory, and hatchery work has made it possible to provide recommendations in this opinion to maintain and develop more favorable habitat for the listed fishes.

#### BASIS FOR OPINION

##### COLORADO SQUAWFISH

Early records indicate that the Colorado squawfish was once found throughout the Colorado River system from the upper Green River in Wyoming to the Gulf of California, including the Gila River basin in Arizona. It was abundant over all of its range prior to the 1850's (Seethaler 1978).

The present range of the Colorado squawfish is restricted to the Upper Colorado River Basin and the number of this species is declining. It is found inhabiting about 360 miles (mi) of the mainstem Green River, from the mouth of the Yampa River to its confluence with the Colorado River. Its range extends 108 mi up the Yampa River and 136 mi up the White River, tributaries to the Green River. In the mainstem Colorado River it is found from above Lake Powell extending about 200 mi upstream and from the lower 30 mi of the Gunnison River, a tributary to the mainstem Colorado River. Approximately 80 mi of known squawfish habitat above the proposed dam site (about 10% of the total known squawfish habitat)

will be adversely affected due to the WRDP, primarily because the dam may physically block seasonal movement of squawfish in and out of this 80-mile section of habitat above the proposed dam. In addition, at least 14 mi of riverine habitat will be converted to lentic habitat.

Studies in the White River have documented occurrence of squawfish in several locations. There are unsubstantiated reports of squawfish that were commonly caught by hook and line in the 1940's from the bridge across the White River near Bonanza, Utah (Seethaler 1978). Several adult squawfish were observed or collected in the upper White River in Colorado (near Piceance Creek) in the late 1960's (May 1970) and in 1977 (Prewitt et al. 1978). Six adult squawfish were captured and at least seven others observed in the lower 12 mi of the White River in July and September of 1978. Two squawfish were captured in the White River 29 mi and 42 mi above the mouth in May and June 1979, respectively (Lanigan and Berry 1979). Two squawfish were found in Colorado 52 mi upstream from the Utah border in 1978. The Colorado Division of Wildlife collected one adult squawfish about 122 mi up the White River in 1980 and collected one adult squawfish and saw one other 136 mi up the White River in 1981 (Personal Comm. with Ed Wick, February 1, 1982). Squawfish have been found consistently in the Green River at the mouth of the White River.

In the only intensive systemic study carried out in the White River, during the 1981 field season, the FWS collected 51 Colorado squawfish, of which 37 (72%) were adults over 400 millimeter (mm) total length (TL) and 14 (27%) were juveniles ranging in size from 60 to 400 mm TL. Only 17 of these 51 squawfish (33%) were collected above the proposed dam site. The upper range of distribution appears to be 134 mi up to the White River. No young-of-the-year (YOY) squawfish have been collected in the White River.

Decline in populations of Colorado squawfish correlates very closely with the construction of dams and reservoirs and the removal of water from the Colorado River system. Colorado squawfish evolved in and apparently require habitat conditions typified by great seasonal fluctuations in flow, high turbidity and silt load, and warm summer temperatures. Additionally, it appears that the Colorado squawfish requires relatively unrestricted movement to satisfy their migration needs. Movement of adult Colorado squawfish appears to be related to flow, temperature, feeding and spawning behavior. Movement and spawning migrations have been documented by tagging and radio-tracking programs (FWS 1982). A potential movement between the White and Green Rivers is indicated by the capture of a large number of squawfish at the mouth of the White River, the recapture of a squawfish in the lower White River tagged in the Green River, and the movement of two radio-tagged fish between the Green and lower White Rivers. In addition, one radio-tagged squawfish moved from the lower White River into the lower Green River and returned back into the lower White River, traveling almost 400 mi from May 29 to October 7, 1981, when contact was lost.

In the White and Yampa Rivers upstream and downstream movement occurs in association with spawning. There is evidence of homing behavior with some radio-tagged fish returning to areas where they were originally tagged following extensive migration (FWS 1982).

FWS (1982) concluded from collections of larvae and YOY Colorado squawfish below suspected spawning sites that there is a downstream drift of larvae and YOY following hatching. This movement can be any distance from a few miles (1-10 mi) to many miles (up to 100 mi). There is also evidence that, after their first year, some juvenile fish may move progressively upstream to areas of better feeding including lower sections of tributary streams.

Apparently, natural spawning of squawfish occurs between 20 and 22°C. Spawning both in the hatchery and in the field occurred between June 15 and July 15. At 13°C, egg mortality was 100% in a controlled test. At 16 to 18°C, development of the egg is slightly retarded, but hatching success and survival of larvae were higher. At 20 to 26°C, development and survival through the larval stage were up to 95% (FWS 1982). Juvenile temperature preference tests showed preferred temperature that ranged from 21.9°C to 27.6°C with an estimated final preference of 24.6°C, which was approximately the same as that for adults.

To complete its life cycle, the Colorado squawfish requires water temperatures of 20 to 28°C from mid-June to October. A temperature of about 20°C is required for spawning while temperatures that are near 24°C, the preferred temperature, are needed for optimal development and growth of young (FWS 1982).

Although no Colorado squawfish spawning has been documented in the White River, a potential spawning site with characteristics similar to a known site on the Yampa River exists about 15 miles below the proposed dam site. A radio-tagged squawfish was tracked to River Mile 34 of the White River on July 16, 1980, where apparent spawning behavior was observed on a riffle (FWS 1982). The significance of this is that there is only one known squawfish spawning site in the upper Colorado River basin (lower 20 mi of Yampa River). A key to preserving the Colorado squawfish is the preservation of the integrity of its spawning site and the maintenance of conditions conducive to egg survival (FWS 1982).

The proposed WRDP, without the conservation measures, would adversely alter habitat characteristics in the White River believed essential for continued existence of the Colorado squawfish. The project would reduce peak spring flows, reduce turbidity and silt load, and reduce annual flows.

The project could potentially isolate those squawfish above the dam site, preventing these fish from migrating. Conversion of a lotic habitat into a lentic habitat, via the construction of the proposed reservoir, would create habitat favorable for non-native fish species resulting in decreased habitat for the native species. This apparently will not adversely affect the adult life stage as adults in good condition have been collected in Lake Powell. This could potentially contribute to the further proliferation of non-native fish species in the upper Colorado River basin. However, if a reservoir fishery using native fish is established (see number 4 of conservation measures), this should not happen.

It is our opinion that the WRDP will not significantly alter the temperature regime below the proposed dam. In fact, the water released from the dam will likely be warmer in May and June than is presently recorded in the White River and the change may be beneficial to squawfish.

The White River is one of two tributary streams in the Green River Basin still considered acceptable habitat for squawfish. The other suitable remaining tributary is the Yampa River. Other historically important tributaries have been so altered that they no longer receive significant use from squawfish. Alteration of the upper mainstem Green River by Flaming Gorge Reservoir has increased the importance of the major tributaries. The relatively natural flows of major tributaries entering the Green River below Flaming Gorge help to ameliorate the effects of that reservoir. In light of the above, the WRDP would have been likely to jeopardize the continued existence of the Colorado squawfish without changes to the project that have been agreed to as is discussed in the Conservation Measures section of this opinion.

#### HUMPBACK CHUB

The only major populations of humpback chub conclusively known to exist in the upper Colorado River basin are located in Black Rocks (river mile 135-137) and Westwater Canyons (river mile 116-124) on the main Colorado River. Incidental captures were recorded from Cataract Canyon; throughout Gray and Desolation Canyons on the Green River; and at the lower end of Cross Mountain Canyon and in Yampa Canyon on the Yampa River. Populations of indistinct taxonomy were identified near Coal Creek in lower Gray Canyon and in DeBeque Canyon (river mi 195-197) on the main Colorado River (FWS 1982).

Since the WRDP will not have any significantly measurable effect on the Green River at the sites where known humpback chub populations occur, in our opinion, the proposed project is not likely to jeopardize the continued existence of the humpback chub.

**BONYTAIL CHUB**

The only recognized pure population of bonytail chub occurs in Lake Mohave, Arizona (FWS 1982). Since the WRDP will not have any significant effect on the lower Colorado River basin, in our opinion, the proposed project is not likely to jeopardize the continued existence of bonytail chub.

**BALD EAGLE**

The bald eagle occurs in the project area mainly as a winter resident and a spring and fall migrant. Bald eagles congregate at specific wintering sites in Utah from late October through March. Open water on the White River during spring and fall attracts eagles because of fish and waterfowl availability. Deer carcasses along the riparian zone and rabbits on the nearby uplands provide additional food. The eagles also roost in the cottonwood trees along the river.

Fewer than six eagles were observed in the project area during a DWR survey during 1975-76. Approximately eight eagles were observed during a DWR and BLM helicopter flight on January 30, 1978. Fifteen eagles were observed in the project area during a survey on April 1, 1980. Eagle use along the White River, in winter, is marginal because the river is usually frozen over, reducing prey availability. We suspect that the period of highest eagle use in the project area occurs during spring migration. Canada geese and other waterfowl populations increase in the spring, offering eagles an additional food supply.

It is doubtful the proposed WRDP would produce benefits for the bald eagle. The White River between the proposed dam and the confluence with the Green River may provide more open water in the winter, but this potential benefit would be largely offset by loss of riparian habitat inundated by the reservoir. Habitat suitable for wintering bald eagles should contain large open perch trees near adequate food supplies. Many reservoirs in Utah and Colorado lack these requirements and use by eagles is minimal. We do not expect the soils surrounding the high water mark to support cottonwood trees; therefore, the relatively treeless shoreline would reduce the value of the area for bald eagles. Moreover the White River Reservoir would often be frozen over during winter, offering little prey for eagles. The reservoir surface still may be frozen in late March when most bald eagles have left Utah. Consequently, an ice-free reservoir in the spring would provide fishing and foraging for stragglers only.

The proposed project is not likely to jeopardize the continued existence of the bald eagle because no nesting birds are involved, and because the species has broad winter habitat requirements, and is an opportunistic feeder. Additional riparian habitat occurs above and below the project impact area. However, the loss of 13.5 miles of riparian habitat would

be part of a cumulative loss of eagle habitat along the White River. Future energy exploration and development will place further demands on river water, contributing to the loss of additional riparian habitat. Therefore, recommendations are later discussed which will contribute to the conservation of the bald eagle.

#### PEREGRINE FALCON

Populations of the peregrine falcon sharply declined in the 1940's, and the species has disappeared as a wild breeding bird east of the Mississippi River. At least 40 pairs of peregrines nested in Utah in the early 1940's, but only two pairs were known to have nested in the State in 1979.

Conditions in the project vicinity appear favorable for nesting falcons, and DWR considers habitat along the White River to be suitable for falcons. The segment of the river to be inundated has extensive precipitous cliffs and the riparian habitat offers a variety of prey. Nevertheless, DWR surveys of the area have not revealed evidence of nesting peregrines. Consequently, in our opinion the proposed project is not likely to jeopardize the continued existence of the peregrine falcon.

#### UINTAH BASIN HOOKLESS CACTUS

This cactus species occurs on gravelly soils of hills and mesas in desert shrub communities from 4,000 to 6,000 feet in Duchesne and Uintah Counties. No populations of this cactus are known in the project impact area; however, suitable habitat exists near the proposed reservoir site. Consequently, a BLM sponsored botanical survey for this and other plant species was conducted on the area in 1980, and none were found.

#### RECOMMENDATIONS FOR BALD EAGLES

Section 7(a)(1) of ESA states that all Federal agencies shall utilize their authorities by carrying out programs for the conservation of endangered and threatened species. The following will help with the conservation of bald eagles.

The main objective in managing wintering bald eagles is to provide them with suitable habitat so they can return to the breeding range in healthy condition. Suitable winter habitat involves maintaining adequate food supplies, and protecting roost sites from human development and disturbance. We recommend that cottonwood stands below the dam be maintained. Furthermore, we recommend planting of cottonwood trees along the shoreline where soil and water conditions favor their development.

Because eagle electrocutions are a serious problem in Utah, electrical distribution lines, especially those between 4 kilovolt and 69 kilovolt should be constructed according to specifications in the 1975 manual "Suggested Practices for Raptor Protection on Powerlines."

CONSERVATION MEASURES FOR THE COLORADO SQUAWFISH

The following conservation measures have been incorporated as a part of the project by the State of Utah and are being considered as project features in this opinion. The State of Utah will provide funding and/or equivalent resources to insure that the following conservation measures are implemented. Specific details on time frames, funding, and responsibilities will be contained in a memorandum of agreement entered into by appropriate officials of the State of Utah and Department of the Interior and such agreement will be reached prior to any physical construction activities.

## 1. Operation of the dam.

- a. The applicant has designed the outlet works of the dam to allow water to be released from four different levels in the reservoir. Using this design feature, the applicant will insure that release water from the dam will approximate natural temperatures from the White River entering the reservoir for any given period of time. Between June 15 and July 31, the minimum daily temperature of the release flow will be at least 19°C. The temperature model provided by the State of Utah depicted that temperatures in this range could be adhered to.
- b. Beginning with the reservoir filling period and continuing after the reservoir begins operation, annual meetings will be held between the FWS and the State of Utah. The purpose of these meetings will be to determine the operating criteria for the project facilities annually, including the release of water from the reservoir to meet the needs of the Colorado squawfish that are described below. These stream flow releases shall be determined by taking into account all stream flow forecasting information capabilities available in keeping with the advanced "state of the art." The State of Utah shall use information provided by DWR, FWS, and BLM to provide the agreed upon releases for squawfish.

Information analyzed to establish key flow needs were: stream flows supplied by the State of Utah, hydraulic analysis of key flow years (1977-1981), flow hydraulic simulation modeling developed by the FWS Instream Flow Group, FWS Coordination Act Report, and 1+ years of extensive field work. Operating criteria for flow releases will be based upon (1) normal or wet, (2) dry, and (3) critically dry water years. Based upon flows established from a stream flow frequency analysis of the 1931-1980 50-year period of record from the U.S. Geological Survey gaging station on the White River near the Colorado-Utah State line, the stream flows for the (1) normal or wet, (2) dry, and (3) critically dry years using the above criteria based on a Log Normal stream flow frequency analysis would be:

1) Normal or wet	Greater than 235,000 af
2) Dry	235,000 to 175,000 af
3) Critically dry	175,000 af or less

The type of water year will be determined each year in the annual meeting referred to above using information based primarily upon basin runoff forecasts. The definitions for the type of water year could be changed in the future, upon agreement of the DOWR, BLM, and FWS, especially if significant upstream depletions occur.

The following releases from the project facilities are needed for Colorado squawfish and have been agreed to by the State of Utah. These releases will be the basis for the operation criteria discussed above. Further information may permit changes in releases and such changes must be agreed to by the FWS.

- 1) Normal or Wet water year - Minimum of 250 cfs average monthly stream release from August 1 to June 14. From June 15 through July (critical spawning period), a range of 700 cfs to 300 cfs on a mean monthly basis. Daily release fluctuations shall not be greater than 100 cfs.
  - 2) Dry water years - Minimum of 250 cfs average monthly stream release from August 1 to June 14. From June 15 through July, an average monthly release of 375 cfs with a minimum daily release not less than 250 cfs. Daily release fluctuations shall not be greater than 100 cfs. It is recognized that natural flows may be below a minimum daily release of 250 cfs, in which case the amount of release will equal or exceed the natural inflow to the reservoir. When the inflow to the reservoir falls below the 250 cfs minimum, the DOWR will provide up to 5,000 af from inactive storage to augment the low stream flow as directed by the FWS.
  - 3) Critically dry water years - It is recognized that natural inflows during a critically dry water year will be below a minimum daily release of 250 cfs during certain periods, in which case the amount of release will be jointly determined in the annual meetings between the State of Utah and FWS. Releases during critically dry water years will at least equal or exceed the natural inflow to the reservoir. The DOWR will provide up to 5,000 af from inactive storage to augment the low stream flow during critically dry water years as directed by the FWS.
2. Monitor the suspected spawning site on the White River which is located approximately 15 miles below the dam.
    - a. A plan will be jointly developed by BLM, the State of Utah, and FWS, subject to FWS's approval, for the State of Utah to carry out and implement the following measures:
      - 1) Determine if this area is being utilized by squawfish for spawning.

- 2) Compare this site with the spawning site on the lower Yampa River in order to provide habitat enhancement, if FWS determines that it is advisable for the State of Utah to implement such enhancement measures.
  - 3) Carry out a contingency procedure if supplemental stocking is deemed advisable by FWS. Should include planting Colorado squawfish eggs or imprinting fingerlings at this spawning site for the purpose of supplementing or establishing a spawning population that will home to this area.
  - 4) Verify the recommended flow and temperature releases made in this opinion to determine the effect on the potential spawning area and modify releases as FWS determines advisable.
- b. Since there will be at least one field season (1982) prior to construction of the dam, another year of information shall be gathered to supplement the information collected in 1981 on the White River. A study will be developed jointly by the State of Utah, BLM, and FWS and be carried out by the State of Utah during the summer and fall of 1982 to gather more information on the suspected spawning site, migration data, and squawfish population below the proposed dam site.
3. Monitor the squawfish habitat above the dam.
- a. A plan will be jointly developed by BLM, the State of Utah, and FWS subject to FWS's approval, for the State of Utah to carry out and implement some or all of the following measures:
    - 1) Recover squawfish in this area and move them downstream to the suspected spawning site or move them to a hatchery for broodstock.
    - 2) Monitor the stability of the squawfish population and obtain an estimate of the total number of squawfish above the dam.
    - 3) Attempt to establish a Colorado squawfish population in the reservoir and upstream.
  - b. A study will be developed jointly by the State of Utah, BLM, and FWS, subject to FWS's approval, and be carried out during the summer and fall of 1982 to gather more information on the squawfish population above the proposed dam site.
4. Determine the feasibility of squawfish passage around or through the dam. These conservation measures relating to the upstream population do not guarantee that there will be a self-sustaining subpopulation in the area above the dam. However, in our opinion the potential loss of that subpopulation will not result in the likelihood of jeopardy of the species.

- a. This will require investigation of several techniques such as fish passage ways, trucking, etc. (This would correlate with number 3a.1. above)
  - b. If determined feasible by FWS, a plan will be implemented to move squawfish around or through the dam.
5. Carry out habitat enhancement work for the adult Colorado squawfish above and below the reservoir if determined feasible by FWS, based upon monitoring work.
6. Participate in carrying out actions and measures to be identified in the forthcoming conservation plan for the endangered Colorado River fishes. This likely will include but not be limited to supporting the development of an endangered species hatchery and contributing a share of the manpower, equipment, materials, or equivalent funding for hatchery planning, site selection, design, and fish stocking. The extent of participation will be based upon percent of impact this project has on the entire population of Colorado squawfish equitably measured, based upon stream flow depletion and/or percent of habitat impacted.
7. Development of a reservoir fishery in the White River reservoir using native species only.
- a. Study the feasibility of developing a fishery for the Colorado squawfish. The Colorado squawfish was an important food resource in the past, and the sportfishing potential of this fish should be fully explored. Reports indicate that it may reach 80 pounds, readily hit artificial lures, and that it is good eating. In fact, a fishery existed for the Colorado squawfish on the lower Colorado River until 1910 and even later in the Salt River basin, Arizona (revised draft recovery plan for the Colorado squawfish).
  - b. If determined feasible by the FWS, the State of Utah will establish a Colorado squawfish sport fishery in the reservoir. This would require that the Colorado squawfish be downlisted to a threatened status in the White River reservoir only.

#### POTENTIAL LISTING OF NEW PLANT SPECIES

The BLM Vernal District has discovered a plant population in the genus Penstemon on the site of the proposed reservoir which may be a previously undescribed species. Two smaller populations have been found outside the reservoir site. A scientific manuscript has been submitted for publication and describes this plant as a new species and is under review by the scientific community. Until it is decided by taxonomists whether this plant is a valid species, we will refer to it as Penstemon

sp. or White River penstemon. This Penstemon is presently a candidate species for listing as a Federally endangered species. The BLM is searching for Penstemon sp. in other likely habitats outside the proposed reservoir site. It appears restricted to the Evacuation Creek member of the Green River formation, thus, its distribution probably is quite limited.

It is possible that the WRDP could destroy a significant segment of the known White River penstemon population. However, it is likely that this plant can be transplanted to suitable habitat similar to the habitat to be lost to the WRDP. A memorandum of understanding (MOU) is being developed between FWS and BLM to carry out transplant work. It is intended that this MOU will be signed before right-of-way permits can be issued. It is our opinion that with a properly implemented MOU, the continued survival of the White River penstemon will be insured. The implementation of this MOU would also avoid the need to have an emergency listing for this species as a result of the WRDP and the unexpected development of later problems.

We appreciate your strong interest in conserving endangered species.



ROBERT H. SHIELDS