

G. FISH AND WILDLIFE
COORDINATION ACT REPORT



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(AHR)

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

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ALBUQUERQUE, NEW MEXICO 87109

DEC - 9 1983

Memorandum

To: Regional Director, Bureau of Reclamation, Lower Colorado Region,
Boulder City, Nevada

From: ^{ACTING} Regional Director (AHR)

Subject: Fish and Wildlife Coordination Act Report on Plan 6, Central Arizona
Project, Regulatory Storage Division, Arizona (BR)

This is our report prepared under authority of and in accordance with Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended); 16 U.S.C. 661 et seq.) for the subject project. As per the conditions set forth in the 1982 Memorandum of Understanding between the Bureau of Reclamation and Fish and Wildlife Service (Contract No. 2-07-30-X0207), this report presents our assessment of impacts on fish and wildlife resources and recommendations to mitigate such impacts caused by the construction and operation of the selected alternative, Plan 6, with major project works located in Maricopa, Yavapai, and Gila Counties, Arizona.

Data describing project facilities were obtained from discussions with Arizona Projects Office personnel, the Project Action Description for Plan 6 provided to this office on August 26, 1982, and its October 1983 revisions, and from the staff of Dames and Moore, consultants to the Bureau of Reclamation for the Central Arizona Water Control Study.

The attached report assesses the effects of the project on fish and wildlife populations and habitat over the life of the project. It presents details of project plans as currently known and detailed in the Plan 6 Project Action Description, an evaluation of project-induced impacts on fish and wildlife obtained through HEP and other means of analysis, needs, and opportunities for mitigation or enhancement for fish and wildlife, and recommendations for additional studies.

This report has been developed in coordination with the Arizona Game and Fish Department and has that agency's concurrence as evidenced by the attached letter dated February 24, 1983.

The proposed plan - Plan 6 - selected by the Bureau of Reclamation as the preferred alternative consists of four major elements: New Waddell Dam on the Agua Fria River, Cliff Dam on the Verde River, New or Modified Roosevelt Dam on the Salt River, and New or Modified Stewart Mountain Dam on the Salt River. Ancillary project facilities include a reversible canal connecting the New

Waddell Dam to the Granite Reef Aqueduct of the Central Arizona Project, an aqueduct linking the Salt-Gila Aqueduct to the Granite Reef Diversion Dam downstream from the confluence of the Salt and Verde Rivers, pumping facilities, transmission lines, access roads, and, at Roosevelt and Cliff, hydroelectric power facilities. Recreational development has been planned at the New Waddell, Cliff, and Roosevelt sites to replace or supplement existing facilities.

Specific actions included in the project plan as of October 1983 as mitigation for impacts to fish and wildlife resources are listed below:

- Post-construction reclamation of construction, staging, borrow and waste areas not within reservoirs or river channels will be accomplished by returning the ground to natural appearances and by revegetation.
- Upon completion of construction, all haul roads not within the reservoir areas or not converted to access roads will be returned to natural grades and revegetated.
- Dust suppression controls, such as periodically wetting of the haul roads, will be used whenever practical.
- All but 1,425 acres of vegetation within the conservation pool of the proposed New Waddell Reservoir will be retained.
- All but 3,261 acres of vegetation within the conservation pool of the proposed Cliff Reservoir will be retained.
- All vegetation within the conservation pool of the proposed Roosevelt Reservoir will be retained.
- Reservoir drawdown rates will be limited to 2 inches per day during the month of March and first two weeks of April at the proposed New Waddell Reservoir.

The above project measures will provide a degree of mitigation for fish and wildlife losses. However, major habitat losses attributable to the construction and operation of the proposed project will still occur.

PROJECT IMPACTS

Inundation by new or enlarged project reservoirs will result in the loss of wildlife habitat. The greatest amounts of wildlife habitat lost will occur as large tracts of Upland Desert totalling 9,520 acres are flooded by the impoundment of project waters and removed as terrestrial habitat. Inundation will also destroy valuable riparian communities of cottonwood-willow (410 acres) and mesquite (820 acres).

The quality of fish habitat provided by the proposed project reservoirs will be affected by vegetation clearing in the reservoir pools and the rate of drawdown of the reservoirs during critical spring spawning periods.

As proposed, the project reservoirs will not be operated to maintain minimum pools specifically reserved for the benefit of reservoir fisheries. Fish kills during periods of high water temperatures and low dissolved oxygen levels could be caused by extremely low water levels.

Dramatic increases in project recreation use would impact the quality of habitats surrounding the proposed impoundments. Encroachment by recreation development on special resource areas such as the Roosevelt Lake Wildlife Area would cause a decrease in value of these areas as wildlife habitat.

Project actions will inundate approximately 6 miles of the Verde River following the closure of the proposed Cliff Dam. The breaching of Horseshoe Dam at this proposed element site will expose approximately 6 miles of the Verde which are currently underlying Horseshoe Reservoir. Substantial efforts would be needed to return the newly exposed stretch of river to a free flowing stream. Project operations will also impact riverine systems downstream of the proposed dams as flow regimes are modified through water releases.

Endangered species exist within the proposed project area and impacts upon these species are of major concern. Formal consultation under Section 7 of the Endangered Species Act has resulted in a Biological Opinion issued by the Fish and Wildlife Service, Region 2. This opinion found that the project, if constructed as planned, is likely to jeopardize the continued existence of the southwest bald eagle population. The opinion offered reasonable and prudent alternatives to alter the project in such a manner as to remove the condition of jeopardy. In addition, the opinion recommended certain measures for incorporation into project plans that would assist in the conservation of the Gila topminnow.

RECOMMENDATIONS

The analysis of impacts to fish and wildlife resources caused by the proposed project also produced a variety of measures to either avoid or lessen adverse effects or to create opportunities for the project to enhance those resources. Losses to terrestrial habitats will result primarily from the destruction of those habitats through inundation. Such losses will require substantive mitigation efforts to replace either through establishment of new plant communities of equal value to wildlife, or improvement of the habitat quality of existing communities within the project boundaries.

Recommended measures for lacustrine habitats impacted by project construction and operation, particularly the proposed New Waddell element, are directed toward improving quality of the new and/or enlarged reservoirs to regain or enhance existing levels of habitat quality. The Waddell reservoir (Lake Pleasant) now supports a valuable sport fishery. Mitigation measures have been provided to improve habitat quality in the new reservoir to maintain a fishery that would support recreation at the same level of angling success (catch per unit of effort) as now exists.

1. Reservoir Fish Cover

In order to provide suitable fish habitat within project reservoirs, we recommend that vegetation clearing plans, as proposed for the Waddell and Roosevelt elements, be implemented and that clearing of the Cliff Reservoir site be limited to selective removal of vegetation as necessitated by operation and safety constraints.

Retention of terrestrial vegetation within the Cliff conservation pool would provide terrestrial habitat until inundation and fish cover after the reservoir is filled. This mitigation is expected to increase fish cover, thereby providing higher quality lacustrine fish habitat. Safety considerations, such as clearing in the immediate vicinity of boat ramps, swimming beaches, and other similar recreation sites, and for the safe operation of appurtenant project works such as spillways, outlets, and power intakes, could be accommodated while leaving the major portion of uncleared vegetation available for fish cover. The clearing proposed for the Cliff reservoir is designed to remove navigation hazards to power boats operating on the reservoir. Horsepower limitations and no-wake zones are alternative recreation management options that would negate the need for clearing.

If vegetation is cleared, we recommend that it be bundled and anchored to the reservoir bed or that artificial cover be provided.

2. Rehabilitation of Upland Desert Habitat

Improvement of the quality of existing upland desert habitat is recommended to mitigate for 72 percent of the desert habitat values lost through project actions. Such improvement would be achieved through the following:

- a. Provision of wildlife watering devices at suitable locations and densities; and,
- b. Exclusion of grazing and ORV use on project-withdrawn lands lying below the Inflow Design Flood elevations, in cooperation with land management agencies.

These measures could increase the carrying capacity of desert habitat remaining within the project boundaries through the expected increase in habitat quality. Of the two recommended measures, exclusion of grazing and elimination of ORV use represent approximately 95 percent of the anticipated AAHU's derived from the HEP and therefore constitute the dominant factors in improving desert habitat quality through the mitigation detailed above.

Placement of the wildlife watering structures should be within the area between the Maximum Storage Pool and Inflow Design Flood elevations. The recommended density of these structures is 4 per 640 acres (or less, depending upon the availability or density of natural or existing water sources).

Full (100 percent) mitigation in this cover type is possible but would require the acquisition of additional lands exterior to proposed project boundaries

upon which habitat improvements may be implemented. We recommend that the possibilities of cooperative land management with the Maricopa County Parks and Recreation Department be explored in order to obtain complete recovery of lost habitat values. If additional lands are deemed unavailable for 100 percent mitigation in this cover type, suitable gains in acceptable substitute cover types may be considered.

3. Rehabilitation of Riparian Habitat

In order to provide and protect riparian habitat (Resource Category II) within the project boundaries the following programs are recommended:

- a. Revegetation of 250 acres of cottonwood-willow and 690 acres of mesquite at the Cliff site;
- b. Creation of 20 acres of cattail marsh at the Cliff site through "pot hole" excavation if this cover type does not naturally establish itself at the site; and,
- c. Exclusion of grazing and ORV use on project withdrawn lands lying below the Inflow Design Flood elevations at all project elements, in cooperation with land management agencies.

These measures were designed to provide complete in-kind mitigation for lost riparian habitats. Alternative planting schemes could be implemented that would involve fewer acres if irrigation were provided to the revegetated areas. The Cliff location is considered the most suitable site for attaining 100 percent replacement of habitat values and possible enhancement.

The exclusion of grazing comprises the primary component of this recommendation and is viewed as the essential factor in determining the success of revegetation efforts. Because of the preference of domestic livestock for cottonwood and willow seedlings, and the tendency of livestock to concentrate in riparian areas, to revegetate cottonwoods and willows in areas where grazing would be permitted would negate any potential benefits to wildlife habitat.

4. Reservoir Drawdown Rates

In order to provide spawning habitat for largemouth bass, we recommend that New Waddell Reservoir be drawn down at a rate not to exceed 2 inches per day during the period April 1 through June 30. Without such mitigation, it is expected that the suitability of the new reservoir for the bass and the species which it represents would decrease, resulting in lowered densities of sport fish within the greatly enlarged reservoir. Other alternatives to limiting the rate of drawdown may be considered:

- a. Construction of a warm water sport fish hatchery, as delineated by the Arizona Game and Fish Department, located along the reversible canal proposed for the Waddell element. This fish hatchery would be used to replace the fish production lost by dewatering of spawning sites through reservoir drawdown.

- b. Purchase of fish to replace fish production lost through dewatering spawning sites.

The alternative measures of a hatchery or fish purchase are recommended for implementation if suitable draw down rates cannot be provided. Adequate mitigation might entail one or a combination of these measures. Mitigation would also be dependent upon fishery investigations concerning competition, at Waddell, with introduced Colorado River species.

5. Stream Rehabilitation

In order to mitigate for the 6 miles of river to be inundated by the proposed Cliff reservoir, we recommend the implementation of a stream habitat improvement program on the 6 miles of the Verde River that would be exposed following the breaching of Horseshoe Dam. The timing of such a program and the methods used would depend upon the natural recovery processes of the river as it evolves from a silt-laden reservoir bottom to a flowing stream and upon further detailed plans for breaching of the structure. This mitigation would be supplemented by the recommended riparian rehabilitation program at this site. Such revegetation would provide streamside vegetation to shade and stabilize the river banks.

6. Minimum Pools

Minimum pools approximating 12 percent of new reservoir storage capacities (by volume) are recommended for any reservoir created or modified by project implementation. Such mitigation would avoid the potential for fish kills during extreme low water periods by providing habitat for the fish under the stressful conditions of high temperatures and low oxygen levels.

Alternative measures to minimum pools would be to replace the fish killed during extreme low-water periods through stockings from a hatchery or purchased fish. These alternatives were delineated in recommendation 4.

7. Borrow Areas

In order to avoid disturbance to riparian and riverine ecosystems, we recommend that borrow areas be located within the proposed reservoir pools and shaped to provide fish habitat after inundation. This would obviate the need to reclaim stretches of river bed following construction. It is recognized that in some cases this may not be possible, i.e., where there is an existing reservoir or when suitable borrow is limited. In those cases we endorse the Bureau's stated commitment to direct the contractor to collect borrow with minimal disturbance and to reclaim the area when completed. No borrow areas should be located within any habitat designated as Resource Category I.

8. Haul Roads

In order to minimize disturbance to terrestrial communities, we recommend roads created for construction be closed to public access, returned to natural

contours, and revegetated with native species. Only those roads necessary for construction should be included in the project plans (i.e., no cut off roads, short cuts, etc.).

Where road construction through riparian zones (excluding Resource Category I) is deemed unavoidable, we support the Bureau's requirement that the contractor minimize disturbance to mature trees and revegetate when finished.

9. Fish Barriers

In addition to the fish barrier delineated in the March 8, 1983, Biological Opinion for the conservation of the Gila topminnow population in Tule Creek, we recommend the construction of a fish barrier at Lime Creek (Cliff element) to protect native fish habitat from invasion by non-native reservoir fishes.

10. Roosevelt Lake Wildlife Area

In order to mitigate for the anticipated encroachment by recreation development and use on the Roosevelt Lake Wildlife Area, we recommend the provision of a suitable irrigation system (preferably small scale and portable) at the Area to increase production of food crops for waterfowl. Such mitigation would improve the quality of the Area and help in attracting and retaining waterfowl on site despite recreation-induced disturbances.

11. Instream Flow

The following recommendations are made to avoid adverse impacts to Resource Category I habitats and provide opportunities for enhancement.

Instream flow needs for fish and wildlife have not yet been quantified by the HEP team. Previous studies have shown a need for a 200 cfs minimum flow in the downstream reaches of the Verde River. Therefore, we recommend that an interim minimum flow of 200 cfs be incorporated into the water release operation schedule for both the Salt and Verde Rivers. We further recommend that investigations be conducted to determine the effects of CAP regulating storage and water deliveries on fish and wildlife values in these downstream reaches and identify all mitigation needs and any enhancement opportunities.

As alternatives to instream flow, the following measures should be considered:

1. An operation and maintenance criteria which would preclude dewatering either the Salt or Verde Rivers for periods in excess of seven consecutive days.
2. An operation schedule which would allow releases of water to mimic presently occurring higher flows during the spring of the year to negate impacts to native fishes and riparian habitat.

12. Investigations and Monitoring

We recommend that studies be conducted to fully identify and quantify project impacts on riverine and lacustrine fish populations through pre- and post-construction inventories and population analyses of affected aquatic communities. Specific areas to be addressed by such investigations include Resource Category I areas of the Salt and Verde Rivers, and Waddell and Cliff reservoir areas.

The information gathered from the cooperative fisheries investigation being conducted by Reclamation on introduction of Colorado River ichthyofauna into project waters is needed. Depending on the conclusions of the study, pre- and post-construction studies may be needed to fully assess the impacts and possible mitigation alternatives on the lacustrine habitat at the proposed Waddell element. Such investigations should address impacts on water quality and the valuable sport fishery of the reservoir.

A pre- and post-construction study is also recommended at Horseshoe Reservoir to determine changes in riverine fish composition and the viability of reservoir fisheries due to the replacement of this reservoir by Cliff Reservoir. This study could be coordinated with the fisheries investigation to be conducted for endangered species as per your Regional Director's memorandum of April 1, 1983.

In order to assess the applicability and suitability of any mitigation measures included within the selected action, we recommend that an interagency review committee be formed to assist the Bureau in implementing mitigation measures. This committee should be comprised of representatives from the Fish and Wildlife Service, Arizona Game and Fish Department, Forest Service, Bureau of Land Management, Salt River Project, and Bureau of Reclamation. This committee should conduct formal review of the mitigation every six months during the construction period and convene at the discretion of its members should questions arise concerning mitigation or the results of studies calling for additional mitigation or enhancement.

In addition to the recommendations listed above, the U. S. Fish and Wildlife Service's Biological Opinion issued under Section 7 of the Endangered Species Act provided the following reasonable and prudent measures required to remove the project from jeopardy (Items 1 through 5) and conservation measures (Items 6 and 7) to the Bureau of Reclamation:

1. The Bureau shall work with the Service and the Forest Service to obtain a three-party Memorandum of Understanding (MOU) to implement management strategies and actions to avoid possible adverse impacts on nesting bald eagles in the project area. This MOU shall be consummated prior to project construction.
2. In accordance with an Interagency Agreement between the Service and the Bureau currently in effect, continued participation and support by the Bureau at a minimum of current (1983) funding levels through fiscal year

1987, to gather information on the foraging and nesting ecology and prey base of the Stewart Mountain, Chalk Mountain, and Pinal Creek eagle pairs. Additionally, the Bureau would support Forest Service efforts to maintain nest wardens and provide liaisons between construction forces and the nest wardens to determine effects of observed impacts and coordinate remedial and/or avoidance measures.

3. Horseshoe Dam at the Cliff site to be breached in such a manner and to such an elevation as to promote stream and riparian development in the exposed Horseshoe Reservoir bed, and to avoid excessive erosion.
4. At Meddler Point, either refrain from borrow excavation, or remove materials during the eagle non-breeding season (June through October) and stockpile such materials near the dam (outside the eagle breeding and foraging territory). Excavation of borrow to be conducted in such a manner as to produce no change of hydrologic characteristics of the river in that area. If adjacent to the river channel, the borrow area should be graded and shaped to provide habitat suitable for eagle forage fish and restricted from human use during the eagle breeding season.
5. Construction activities, including blasting, should not be initiated at the Stewart Mountain site during the pre-nesting and early nesting periods (October through March), when eagles are especially intolerant of disturbance. Preferably, activities should be initiated at low levels in April or May, and then continued uninterrupted (with the exception of blasting) throughout the following year(s) until construction is complete. This would give the eagles several months to become habituated to the disturbance prior to their next breeding attempt. All blasting activities should be deferred each year during the egg-laying and incubation period (December through March).
6. To assist in the conservation of the Gila topminnow, we recommend the construction of a barrier to movement of Lake Pleasant fishes up Tule Creek. Such a barrier would be placed at a mutually agreed upon location above the IDF elevation.
7. To assist in the conservation of the bald eagle, we recommend that the Bureau conduct pre- and post-construction fishery investigations to assess the effects of changing water flow and storage regimes on fish availability to foraging eagles below the Bartlett and Stewart Mountain dams. (These studies would be in addition to those indicated in #4 above. They are entirely consistent with, although more specific than, studies the Bureau previously agreed to undertake, as stated in a May 28, 1982, memorandum: "We have accepted assignment of responsibility for taking the lead in determining the distribution, abundance, population fluctuation, and spawning periods of carp, catfish, and suckers in the Salt and Verde Rivers.")

The analysis of the future without versus the future with the proposed Plan 6 using recommended mitigation measures shows that direct project induced

habitat losses can be mitigated equally and in-kind in Resource Category II. The analysis indicated that if the recommended measures analyzed by HEP are fully implemented and are 100 percent successful that enhancement of some habitat values will occur. Within Resource Category III, full mitigation of desert areas onsite is not considered feasible due to several factors: the large amount of habitat lost, the limited amount of the habitat remaining on which mitigation could occur, and the limited degree of improvement that might be expected on the remaining lands. Full mitigation for lost habitat values may necessitate purchase of lands outside project boundaries or acceptance of habitat gains in other cover types for the unmitigated losses in the desert communities.

Lacustrine habitat, also Resource Category III, will be greatly increased in area due to the construction and operation of the proposed project. However, at the Waddell site, habitat quality would be reduced. Proposed measures would improve future-with-project habitat quality. Together with the gains accrued in the areal extent of the enlarged reservoirs, these improvement recommendations would provide enhancement. The indirect impacts (i.e., changes in reservoir fish composition, recreation impacts, downstream habitat changes, etc.) are more difficult to predict quantitatively. Therefore, this report has tried to describe in general terms where and how impacts may occur and to suggest means to avoid or lessen the impacts.

Thank you for the opportunity to provide planning input on the fish and wildlife aspects of the proposed Plan 6. We look forward to continued cooperation during the ongoing planning process.



Attachment

cc:

Arizona Chapter of The Wildlife Society, President, Phoenix, Arizona
Arizona Game and Fish Department, Director, Phoenix, Arizona
Arizona Wildlife Federation, President, Phoenix, Arizona
Bureau of Land Management, State Director, Phoenix, Arizona
Bureau of Land Management, Phoenix District Manager, Phoenix, Arizona
Bureau of Reclamation, Regional Director, Boulder City, Nevada
Bureau of Reclamation, Project Manager, Arizona Projects Office, Phoenix, Arizona
Forest Service, Superintendent, Tonto National Forest, Phoenix, Arizona
Ft. McDowell Mohave-Apache Indian Community, Phoenix, Arizona
Maricopa Audubon Society, President, Phoenix, Arizona
Maricopa County Parks and Recreation Department, Phoenix, Arizona
Salt River Project, Assistant General Manager, Phoenix, Arizona
Regional Director, FWS, Albuquerque, New Mexico (SE)
Field Supervisor, FWS, Ecological Services, Phoenix, Arizona



United States Department of the Interior

BUREAU OF RECLAMATION
LOWER COLORADO REGIONAL OFFICE
P.O. BOX 427
BOULDER CITY, NEVADA 89005

IN REPLY LC-157B
REFER TO: 120.1

DEC 22 1983

Memorandum

To: Regional Director, Fish and Wildlife Service, P.O. Box 1306,
Albuquerque, New Mexico 87103

From: ~~ACTING~~ Regional Director

Subject: Fish and Wildlife Coordination Act Report on Plan 6, Central
Arizona Project, Regulatory Storage Division (your December 9,
1983 office memorandum)

We have received and reviewed the subject Fish and Wildlife Coordination Act Report. We find that the report accurately describes both the proposed action and the existing environment, and objectively evaluates project-induced impacts on fish and wildlife. We feel that the recommendations provided are all beneficial to the environment, and we have given thorough consideration to these recommendations in finalizing our mitigation plan.

We are committed to either minimize or eliminate the adverse impacts caused by the proposed action. The following paragraphs identify our mitigation commitments with regard to your recommendations. These commitments are presented in numerical order corresponding with the twelve recommendations in the subject Fish and Wildlife Coordination Act Report.

1. Reservoir Fish Cover

We will implement the clearing plans for the Waddell element as proposed. No clearing will occur within the conservation pool at Roosevelt. We are presently finalizing a new plan to reduce the extent of clearing to only selective removal of vegetation as needed for safe operation at the Cliff Reservoir site.

2. Rehabilitation of Upland Desert Habitat

We are committed to mitigating the loss of habitat value of upland desert habitat to the greatest extent practical or to compensate for the losses by increasing values in other habitat communities. Permanent water sources will be provided in areas where water is not now available to wildlife. Grazing and off-road vehicle use will be restricted by fencing the Inflow Design Flood and/or by obtaining management agreements on project withdrawn lands at each project site. Negotiations with wildlife and land management agencies will be made to determine how best to mitigate residual losses to this habitat type.

3. Rehabilitation of Riparian Habitat

We are committed to implementing a plan that will result in no net loss of habitat value to the Riparian/Wetland communities upstream of Bartlett and Stewart Mountain Dams and at Lake Pleasant. We will revegetate 250 acres of cottonwood-willow and 690 acres of mesquite at the Cliff site, and we will schedule the breaching of Horseshoe Reservoir so as to aid the establishment of cottonwood-willow habitat. Additionally, all riparian habitat in the construction areas not needed for construction purposes will be protected from damage.

We expect natural reestablishment of cattail marsh at the Cliff site. Should this not occur, we will consider "pot-hole" excavation as a means to mitigate this loss.

4. Reservoir Drawdown Rates

We are committed to reducing drawdown rates at New Wadell to 5 feet or less during March and the first 2 weeks in April. These reduced drawdown periods will be extended into late spring as often as possible, dependent on annual variations in power marketing and other considerations (e.g. seasonal climatic conditions). At a minimum water level conditions suitable for largemouth bass spawning will be provided during normal and surplus water years.

Beneficial effects will result from the proposed action for most aquatic dependent species. Our commitment with regard to adversely impacted game fish is to replace the lost habitat values to the greatest extent practical by either compensating these losses elsewhere or increasing the density of game fish in project reservoirs (as measured by catch/unit effort).

5. Stream Rehabilitation

We are committed to implementing a stream habitat improvement program on the 6 miles of the Verde River exposed following the breaching of Horseshoe Dam.

6. Minimum Pools

Minimum pools will be incorporated into the sediment and inactive storage pools at Cliff and Waddell Reservoir sites. At the Cliff site this pool will be 1,030 acres in size with an average depth of 30 feet and constitute 24.3 percent of the new storage. At Waddell site the pool will be 1,540 acres in area with an average depth of 26 feet. This pool will be 47 percent of (almost half) the size of the existing Lake Pleasant. Since both Lake Pleasant and Horseshoe Reservoir suffer from severe drawdown and presently have no minimum pools, this commitment is a considerable enhancement over existing conditions.

7. Borrow Areas

We will implement this recommendation as presented, to the extent feasible, and all appropriate construction specifications will reflect this commitment.

8. Haul Roads

We are committed to implementing this recommendation as written in your report.

9. Fish Barriers

We will implement this recommendation to the extent feasible.

10. Roosevelt Lake Wildlife Area

We will implement this recommendation to the extent feasible.

11. Instream Flow

At this time we have not identified any adverse impacts to riparian and/or perennial stream habitats below Bartlett and Stewart Mountain Dams due to the proposed operations under Plan 6. Should our proposed operation be altered, we will again evaluate this action and consider instream flows as a potential mitigation measure should adverse impacts be identified.

12. Investigations and Monitoring

To insure the adequacy of the measures proposed in our mitigation plan, pre- and post-construction studies will be conducted. Recommendations stemming from these studies, suggesting additional mitigation, will be evaluated and implemented, if found justified.

In regard to Endangered Species, we are committed to successfully carrying out all of the reasonable and prudent measures required to avoid jeopardizing the bald eagle and conserving the Gila topminnow.

Thank you for both your promptness in putting together the subject report and your excellent cooperation on this project. As stated earlier, our overall commitment is to minimize or eliminate adverse impacts caused by this project. We look forward to your continued cooperation and assistance in helping us achieve this goal.

Roy W. Gear