

SUMMARY
BIOLOGICAL OPINION ON THE EFFECTS TO
APACHE TROUT AND MEXICAN SPOTTED OWL
FROM THE PROPOSED
BURRO CREEK, HAYGROUND AND RESERVATION ALLOTMENT MANAGEMENT PLAN REVISIONS
AND
A WATERSHED APPROACH TO A COLDWATER FISHERIES ON THE WEST FORK OF THE BLACK
RIVER

Date of the opinion:

Action agency: U.S. Forest Service, Apache-Sitgreaves National Forest
Springerville Ranger District

Project: Revision of three livestock grazing allotment management plans in the West Fork of the Black River drainage to include deferred grazing systems and riparian and special use pastures. Stream improvement structures are included in the project. Blue ribbon Apache trout and brown trout fisheries will be established in the West Fork and tributaries.

Listed species affected: Apache trout (Oncorhynchus apache), Mexican spotted owl (Strix occidentalis lucida). A brief examination of effects to proposed endangered with critical habitat Arizona willow (Salix arizonica) included in opinion.

Biological opinion: Non-jeopardy. (page 1)

Incidental take statement:

Level of take anticipated: For Apache trout, the 40% limit on take established in the Land Management Plan has already been exceeded. Improvement to stream conditions over the first three years and over one complete grazing cycle will determine if incidental take continues to be exceeded. (page 20)

For Mexican spotted owl, no specific level of take is established (page 20)

No level of take is set for the Arizona willow

Reasonable and prudent measures: Five objectives for minimizing incidental take are given. Implementation of these measures, through the terms and conditions is mandatory. (page 21)

Terms and conditions: [Terms and conditions implement the reasonable and prudent measures and are mandatory requirements.] Terms and conditions include full implementation of monitoring programs, obtaining alternate funding if needed to implement the projects, ensuring permittee compliance with the grazing plan, construction and implementation sequencing, maintenance of fences and cooperative research efforts. (pages 21-23)

Conservation recommendations: Implementation of conservation recommendations is discretionary. Nine recommendations are given. (page 24-25)

Additional Section 7 consultation needs:

1. Formal consultation will be required for the Arizona willow once listing is finalized.

2. Effects of timber sales in the project area on Mexican spotted owl and Apache trout will be covered in other opinions.



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ARIZONA ECOLOGICAL SERVICES STATE OFFICE
3616 West Thomas Road, Suite 6
Phoenix, Arizona 85019



Telephone: (602) 379-4720 FAX: (602) 379-6629 2-21-90-F-120
2-21-92-I-666

July 20, 1993

Larry Henson
Regional Forester
U.S. Forest Service
517 Gold Avenue SW
Albuquerque, New Mexico 87102-0084

Dear Mr. Henson:

This responds to your request of March 17, 1993, for formal Section 7 consultation with the Fish and Wildlife Service (Service) pursuant to the Endangered Species Act (Act) of 1973, as amended, on the Burro Creek, Hayground and Reservation Allotment Management Plan Revisions (AMPR) and the Coldwater Fisheries Enhancement Project (CFEP) on the West Fork of the Black River. These projects are on the Apache-Sitgreaves National Forests (Forest) in Apache County, Arizona. The species potentially affected are the endangered bald eagle (Haliaeetus leucocephalus), threatened Apache trout (Oncorhynchus apache), threatened Mexican spotted owl (Strix occidentalis lucida) and the proposed endangered Arizona willow (Salix arizonica). Critical habitat for the Arizona willow has been proposed for portions of Thompson and Stinky creeks and the West Fork of the Black River in the project area.

This biological opinion was prepared using information contained in the environmental assessment, biological evaluation and other records furnished or prepared by the Forest and information developed during the informal phase of the consultation. Additional information was obtained through the grey and published literature and through discussions with species experts and other knowledgeable individuals. Data in Service files and other sources of available information were also used.

The 90-day formal consultation period began on March 24, 1993, the date your request was received by the Arizona Ecological Services Office. Notice of that receipt was sent to you in a letter dated April 1, 1993.

Biological Opinion

It is the Service's biological opinion that livestock grazing on the three allotments covered under the AMPR is not likely to jeopardize the continued existence of the threatened Apache trout or Mexican spotted owl. The Service concurs with the finding of no effect to the endangered bald eagle from the AMPR and CFEP and to the Apache trout from the CFEP. The Service also

concur with your finding that the proposed AMPR or CFEP is not likely to jeopardize the continued existence of the proposed endangered Arizona willow or destroy or adversely modify its proposed critical habitat.

This biological opinion and concurrence with the finding of no effect are for the AMPR and CFEP as described in the documents provided by the Forest with the request for formal consultation. There may be other documents, plans, permits or agreements that are needed to implement and operate these projects. These additional items are covered by this biological opinion and concurrence only under two conditions: (1) that their provisions were fully detailed in the AMPR and CFEP documents provided to the Service for this consultation and do not represent a change in the project; and (2) that there are no actual or potential effects to listed or proposed threatened or endangered species or critical habitat that were not fully addressed in this consultation. Additional formal consultation may be required for any actions associated with these projects that do not meet the above conditions.

The Forest stressed in their evaluation the need to provide for management flexibility in the operations of the allotments. The Service realizes that having that flexibility enables the Forest to make decisions based on the current resource conditions, and that can benefit the resource. However, in providing for management flexibility, we cannot forgo proper evaluation of the effects of the action. It must be clear which operations have been addressed under formal consultation, and which have not. This biological opinion only covers operations on the allotments that are within the specifically stated management parameters of the AMPR.

This biological opinion and concurrence does not cover any actions taken under any other Forest projects that may affect livestock grazing on the three allotments or affect physical or biological conditions in the streams. An example of this is the burning and reseeded programs associated with timber sales that seek to provide additional forage for livestock and wildlife. These projects should undergo separate consultation under the terms of the Act.

Background Information

Consultation History

The Service issued a biological opinion on the Land and Resource Management Plan (Plan) for the Forest on May 6, 1986. The opinion found that the Standards and Guidelines in the Plan were not likely to jeopardize the continued existence of the then listed or proposed threatened or endangered species on the Forest. The findings of that opinion were reviewed in 1989 during informal consultation on Amendment 1 to the Plan. This amendment directed the Forest to complete revisions to allotment management plans and place under proper management all allotments with endangered or threatened fish species present on the allotment by 1992. A total of 42 allotments with 303 miles of streams were identified as being covered by the Amendment. This goal has not been reached.

Informal consultation on the AMPR between the Forest and the Service began in April, 1989 when the Forest sent the Service information on the project and preliminary issues. An exchange of project information for review and comment, meetings and other communications continued through November, 1992. The Forest and the Service met on November 23, 1992 to discuss the biological evaluation and agreed there was a "may affect" for the Apache trout.

The CFEP was first described to the Service in a draft project proposal dated May 7, 1992. The Service provided comments on the proposal and concurred by default with a finding of no affect to the Apache trout (consultation number 2-21-92-I-666). Apache trout are not currently found in the West Fork of the Black River, Burro and Thompson creeks in the project area. The possibility of effects to the Arizona willow from the project was identified. The Forest elected to combine this consultation with the AMPR due to the proximity of the two actions. The analysis of effects to the Arizona willow included in this opinion will assist in any future consultation needed for these projects once the listing is finalized.

This consultation and conference must evaluate all direct, indirect, interrelated, interdependent and cumulative effects of the proposed actions. The AMPR proposed action represents a change to the existing livestock management on the three allotments. Pasture and water developments, utilization levels and other aspects of livestock management have no independent utility from the decision to graze livestock. Thus, the action under consultation must consider both decision points; the decision to graze livestock and the management of that grazing.

Desired Future Condition

The Forest Plan identified standards and guidelines for management of forest resources. The AMPR and CFEP are the method of achieving these goals. The appropriate standards and guidelines are incorporated in this document by reference.

The AMPR identifies desired future habitat conditions and identifies factors needed to achieve those conditions. Perennial trout streams (both for Apache and other non-native trouts), riparian habitats (including meadows), waterfowl/wetland areas, recreation and forested lands are identified as having desired future conditions the AMPR and CFEP can assist in accomplishing.

Description of the Proposed Actions

These are summaries of the projects as described in the biological evaluation and biological assessments. Please refer to those documents for complete project information.

Burro Creek, Hayground and Reservation Allotments
Allotment Management Plan Revisions

Location and Current Condition of the Allotments

The three allotments are in the Black River drainage on the Springerville Ranger District of the Forest. Elevations range from 7760 to 9880 feet above sea level. The three allotments total 30,938 acres, of which 78% (23,990 acres) is considered suitable for livestock grazing. Portions of the Allotments have been included in recent timber sales (Burro and Spruce Springs 1987, Duck Lake 1992, Fence 1992, North Fork 1992, Redondo 1992, Bearcat 1992, and Conklin 1993). Recreational uses (fishing, hunting, camping) also occur on the allotments. Recreational use is especially concentrated in the areas of Big and Crescent lakes.

The five Apache trout streams on the allotments (Boggy, Centerfire, Hayground, Home and Stinky creeks) together provide approximately 15 miles of stream habitat. Both upland and riparian habitats are represented on the allotments. Riparian habitats include willow and alder stands and wet meadows. Upland habitats include both forested (spruce-fir, montane conifer and ponderosa pine) and unforested (montane grasslands) habitats. Native grasses such as Arizona fescue (Festuca arizonica), mountain muhly (Muhlenbergia montana) and tufted hairgrass (Deschampsia caespitosa) are found on the allotments along with non-native species such as Kentucky bluegrass (Poa pratensis) and redtop bentgrass (Agrostis alba).

Past management on the watersheds has resulted in degraded riparian areas, incised stream channels, streambank erosion, lowered water tables, sedimentation problems, increased water temperatures and a reduction or elimination of palatable native plant species in riparian and wet meadow areas. Over 99% of the riparian habitats along the 15 miles of stream are in

unsatisfactory condition. Approximately 75% of the streams exhibit habitat conditions below 60% of absolute habitat potential (as measured by the Habitat Capability Index (HCI)) for fish.

Watershed condition over the project area has been determined by the Forest to be satisfactory. Range condition transects on the three allotments were read in 1990. On the Burro Creek Allotment, six of seven transects had good range conditions with two showing an upward trend and four showing no trend. The seventh had fair range conditions with an upward trend. All three transects on the Hayground Allotment had good range conditions with no trend. Three of four transects on the Hayground Allotment had good range conditions, one with an upward trend and two with no trend. The fourth had excellent range conditions with no trend.

In addition to cattle, elk (Cervus elaphus) graze on the allotments. Two separate herds are found in the project area, the Milligan Valley herd to the north and the Black River herd to the south. Elk use the same upland and

riparian areas as the cattle, but not at the same time. The magnitude of effects of the elk population on the range is unclear, but is under investigation by the Arizona Game and Fish Department (AGFD) and the Forest.

Current Management

The Burro Creek Allotment is currently managed for a maximum of 956 cattle in two separate herds with grazing allowed between May and October. The cow-calf herd is managed under a three pasture rest rotation system in which over a three year period, each pasture is rested one year and receives 75-80 days of use either early or late in the grazing season the remaining two years. In a "typical" year, 450 cow-calf pairs are put on the allotment. The yearling herd is managed under a four pasture rest rotation with three pastures used 50-55 days each and one rested per season. A riparian pasture was installed on upper Burro Creek in 1992.

The Hayground Allotment is currently managed for 200 cattle (cow-calf pairs in recent years) with grazing allowed between May 15-October 31. A five pasture rest rotation system is used. Two pastures are used early, one mid-way through the season, one late in the season and one rested. Grazing periods are 30-60 days per pasture.

The Reservation Allotment is managed for 295 cow-calf pairs with grazing allowed from May 15-October 31. A three pasture rest rotation system is used with two pastures used 85 days each and one rested. A riparian pasture on lower Burro Creek was installed in 1991.

Timber sales in the project area have reduced stand densities in harvest areas. Depending upon the type of cut, the magnitude of this reduction will vary. In harvest areas, additional forage for livestock and wildlife may be created by the more open canopy encouraging grasses and herbaceous growth. Seeding programs associated with the sale are also used to increase available forage. Timber sales in the project area are covered under separate consultations.

Description of Proposed AMPR

There is no timeframe given for the implementation of the AMPR. It is likely to take several years to complete the construction and developments needed to fully implement the AMPR. Information from the Forest indicates that water developments are completed before fencing projects.

The proposed AMPR does not call for any herd size reductions on the three allotments. Monitoring information from the Forest indicates that based on forage use patterns and levels, overgrazing on the allotments is not widespread. Some areas do show signs of overuse, and the Forest determined that changing the management would address those issues. Actual numbers of livestock on the allotments will continue to vary within the limits set by the grazing permits.

Management for the Burro Creek Allotment cow-calf herd will use four primary pastures and two "special emphasis" pastures. The four primary pastures (North Burro, South Burro, Railroad and SU) will be grazed under a deferred system for an average of 37.5 days per year. Under this system, the time of year each pasture is grazed is different each year, and all pastures are grazed each year.

The Mandan Pasture is to be managed to improve riparian conditions on part of the East Fork of the Black River. Use of this area for up to seven to ten days in four years out of five is included in the plan. Mandan Marsh would be fenced to exclude livestock and only grazed after July 30 if the Forest determines that such grazing would complement management of this area for waterfowl/wetland values.

A separate pasture around Crescent Lake would be managed to reduce nutrient inflow to the lake and to maintain satisfactory watershed condition by providing for plant vigor and density in the grasslands surrounding the lake. The primary prescription for this pasture is rest; however, livestock grazing use of up to 10-14 days is anticipated "infrequently" to maintain plant vigor and annual biomass production. If significant nutrient inflow to the lake from such grazing were identified, livestock grazing would be reduced.

The Burro Creek yearling herd will use a seven pasture deferred system and two "special emphasis" pastures. Use of the seven pastures averages 20 days per year and all pastures are grazed each year at different times during the season. The Upper Burro Creek riparian pasture (in place) would be used for up to five days two years out of five. The Big Lake Campground/Rec Trap would be used at the end of the season for up to ten days. There are two livestock exclosures (one on Home Creek and one on lower Stinky Creek) and one livestock/elk exclosure included in the AMPR.

The Hayground Allotment will be managed in a six pasture deferred system with one horse pasture and one riparian pasture. Use of the six pastures varies from 15 to 40 days per year. All pastures are grazed each year. The Hayground Creek riparian pasture would be used for up to five days in three years out of five. If riparian recovery in this pasture is not comparable to the proposed adjacent livestock exclosure, rest will be prescribed. An elk/livestock exclosure is also included in this area. The Horse pasture would be used for up to five days each year with time of use either at the start or end of the grazing season.

The Reservation Allotment will be managed in a seven pasture deferred system that includes two riparian pastures on Burro Creek. One "special emphasis" pasture at the Duck Lake waterfowl area and a small horse pasture are also included. Use of the non-riparian pastures varies from 20 to 35 days. The lower Burro Creek riparian pasture would be used up to seven days and the middle Burro Creek riparian pasture would be used up to 13 days. All pastures would be used each year with a varying season of use for the five non-riparian and end of season use only for the riparian pastures. The Duck Lake pasture would be used as a holding pasture as needed. A livestock

exclosure around the lake itself will be constructed. Livestock grazing in the exclosure would only be allowed if it would compliment the waterfowl and wetland values of the area.

Each AMPR contains a list of proposed improvements in the form of fences, spring developments, tanks and other physical improvements. There may be adjustments to specific locations and other changes to these improvements as the AMPR is implemented. As long as these changes do not alter the effects of the action and are within the parameters of the project as described in the biological evaluation, additional consultation should not be necessary. No specific time frame is given for the implementation of these features.

The AMPR contains the option to increase or decrease livestock use of any pasture based upon the results of monitoring. The trigger point for reductions in use is based on the rate of change toward the desired future condition of the pasture when compared to livestock exclosed pastures. For increases in use, if the Forest determines that the desired future condition can be achieved at a satisfactory rate with increased livestock use, the use can be increased. Analysis of changes in pasture use as it affects other pastures will be part of the decision process. Any changes that do not meet the preceding criteria may require additional consultation.

The AMPR also contains provisions for stream improvements in Apache trout streams. On the Burro Creek Allotment, 60 instream structures are proposed for Home Creek and an erosion control drop structure is proposed for Stinky Creek. Habitat improvement structures are included for Centerfire Creek on the Hayground Allotment and for Boggy Creek on the Reservation Allotment. Planting of native willows along several stream reaches on the allotments is also included.

Monitoring of Apache trout populations, trout habitat in the streams, riparian vegetation and management operations is included in the AMPR. Adjustments to the AMPR will be made based on the results of this monitoring.

A Watershed Approach to a Coldwater Fisheries
on the West Fork of the Black River
Coldwater Fisheries Enhancement Project

Project Location and Current Condition

The West Fork of the Black River (West Fork) rises on the White Mountain Apache Reservation and flows generally southward through the Springerville and Alpine Ranger Districts of the Forest to join with the East Fork of the Black River. Portions of the project area are in the Burro Creek, Hayground and Reservation Allotments. The project area includes 11 miles of the West Fork to the confluence with Hayground Creek and portions of two tributary streams; Burro and Thompson creeks.

Some reaches of the West Fork and Thompson Creek were in satisfactory riparian condition and had aquatic habitat HCI values over the 60% minimum. Other reaches of these streams and the evaluated reach of Burro Creek were in unsatisfactory condition for either aquatic habitat or riparian values.

Past management on the watersheds has resulted in degraded riparian areas, incised stream channels, streambank erosion, lowered water tables, sedimentation problems and increased water temperatures. Livestock grazing and timber harvest are the primary land uses in the project area, with recreational uses, especially fishing, also significant.

Description of Proposed Project

The CFEP is intended to create a "blue ribbon" trout fishery on the West Fork. To that end, the CFEP contains plans to improve habitat conditions for salmonids in the streams and to manage for two different, self-sustaining, salmonid populations. Above Forest Road (FR) 116, the West Fork and tributaries would be managed for an Apache trout fishery. Below FR116, the West Fork would be managed for brown trout (*Salmo trutta*). Hayground and Stinky creeks, while located below the FR 116 dividing point, would continue to be managed for Apache trout. The fishery would be managed as lure-only, catch and release.

Stream habitat improvement is proposed to be accomplished through the AMPR for the three allotments involved and the placement of stream improvement structures. In 1992, 41 instream log and boulder fish habitat improvement structures were placed in Burro and Thompson Creeks and the West Fork. Additional structures, gabion barriers and drop structures are included in the AMPR for the three allotments. New parking areas, trailheads and trails are also a part of the project.

Species Description

Apache trout

Background information provided on this species was taken from the Apache Trout Recovery Plan (USFWS 1983). Please refer to that document for information not provided in this summary.

The Apache trout is a species of interior Western trout, medium in size with no red or pink lateral band over a yellow to yellowish-olive ground color. Small dark spots are scattered over the dorsal and lateral surfaces. The dorsal, pelvic and anal fins have a conspicuous cream or pale yellowish tip.

The Apache trout was not recognized as a distinct species until 1972, although it had been recognized as being in need of special management as early as the 1940's and 1950's. Efforts to conserve the species were undertaken by the White Mountain Apache Tribe (Tribe), AGFD and the Service. In 1967 the Apache trout was included on the Secretary of the Interior's list of rare and endangered species. With the passage of the Act in 1973, the

species was included on that list as an endangered species. Conservation and recovery efforts enabled the Apache trout to be downlisted to threatened status on July 16, 1975. Under a special rule, State regulations to allow for recreational take of the Apache trout were allowed. A Recovery Plan for the species was first prepared in 1979 and updated in 1983. Recovery efforts have continued on both Tribal and Federal lands through to the present.

The Apache trout is native to the headwaters of the White, Black and Little Colorado Rivers of the White Mountains of Arizona. Once very abundant in these watersheds, the introduction of non-native species such as the rainbow (Oncorhynchus mykiss), brown and brook (Salvelinus fontinalis) trout had significant adverse effects to the native trout populations. Competition for space in the streams and rivers of the mountain country resulted from the heavy and continuing stocking of these waters with non-native trout for recreational fishing. Another significant impact was the hybridization between the rainbow and Apache trout that resulted in genetic swamping of the native genotypes. Determining which of the remaining populations of Apache trout were genetically pure and could be used in restocking recovery efforts has hampered those efforts. The recent completion of genetic surveys on Apache trout populations will clarify this situation. The 1983 Recovery Plan (USFWS 1983) said there were fewer than 30 stream miles of genetically pure Apache trout, down from an estimated historic distribution of 600 stream miles. Recovery efforts since 1983 have increased the extent of the existing pure populations. The plan identified a goal of 30 pure strain, self-sustaining populations of Apache trout on Forest and Tribal lands as the criteria to delist the species.

Apache trout are similar to other trout in their habitat requirements. Competition with non-native trout is considered a factor in the retreat of Apache trout to the very small headwater streams from their historically wider distribution in the drainages. These streams do not likely represent ideal Apache trout habitats and inference of specific habitat preferences from these areas may be difficult. Measures of habitat quality in these areas can be and have been made and contribute significantly to assessment of management needs.

The Forest and AGFD have cooperated on developing Fish Management Reports for Apache trout streams on the Forest. These reports contain information on the physical and biological condition of streams designated to be part of the Apache trout recovery program. Report recommendations are intended to direct management efforts to improve stream conditions for Apache trout.

Mexican spotted owl

Information on this species is summarized from the proposed and final rules designating this subspecies as an endangered species. For additional information, please refer to those documents.

The Mexican spotted owl is one of three subspecies of spotted owl in North America. The subspecies ranges from Mexico north to the Rocky Mountains and Colorado Plateau. Although several types of forest habitats, including mixed-conifer, Madrean evergreen woodlands, pinyon-juniper woodland and riparian deciduous forest, are used by the owl, all share certain common characteristics. These include high canopy closure and stand density, multilevel canopies, snags and downed logs. Areas of steep slopes and rocky canyons are important habitat for the owl. Owls use home ranges averaging 2092 acres for a breeding pair within suitable habitat. Eggs are laid in April and the young are fully independent by early October. The diet is primarily small mammals, especially woodrats (Neotoma) and also includes reptiles, birds and insects. In the White Mountains of Arizona, voles (Microtus spp.) represented 37.6% of the prey items (16.1% of the biomass) found in Mexican spotted owl pellets (Ganey 1992). Microtus occur in the grassy understories of forests.

Arizona willow

The Arizona willow is a woody perennial, variable in growth habit. It occurs as a rounded or scraggly shrub, a prostrate mat, and as large hedge or thicket forms. It was proposed by the Service to be listed as endangered with critical habitat on November 20, 1992 (USFWS 1992). The Arizona willow is endemic to the high elevations of the White Mountains and is known from 15 to 20 drainages at the headwaters of the Little Colorado, Black and White Rivers in the vicinity of Mt. Baldy, Apache County, Arizona. It grows along riparian corridors above 8,500 feet elevation in unshaded or partially shaded wet meadows, streamsides, and cienegas. Plants are typically found in or adjacent to perennial water. The Arizona willow occurs on lands managed by the U.S. Forest Service, the White Mountain Apache Tribe and minor private holdings.

Proposed critical habitat for the Arizona willow includes approximately 40 miles of linear stream habitat and 160 acres. This includes some currently unoccupied habitat within each of the proposed stream reaches to provide for expansion of the Arizona willow and to maintain ecosystem integrity. The Apache-Sitgreaves National Forest provides approximately 23 stream miles of proposed critical habitat. Constituent elements for all areas of critical habitat except Purcell Cienega (on the Fort Apache Indian Reservation) include areas with an adequate quantity and quality of surface and subsurface water within 200 yards of the center of the drainage bottom (measured perpendicularly to the channel), except where the following habitat conditions are met: a) tree canopy cover exceeds 25 percent or b) habitat is dominated by Arizona fescue and mountain muhly.

In the AMPR and CFEP project area, critical habitat has been proposed for the West Fork of the Black River and on Stinky and Thompson creeks through the Burro Creek Allotment.

Environmental Baseline

The environmental baseline includes past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal actions in the action area that have already undergone formal or early Section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. Actions taking place on Tribal lands are considered part of this baseline. The environmental baseline defines the current status of the listed species and its habitat to provide a platform to assess the effects of the action now under consultation.

The overall status of the Apache trout has been improved by interagency recovery efforts. These have involved constructing barriers on Apache trout streams and renovating the upstream reaches to eliminate non-native trout, then restocking with genetically pure Apache trout. These actions work to eliminate the adverse effects of non-native competition but do not address the issue of physically degraded habitat.

Apache trout streams on the Forest are generally not in good condition to support healthy fish populations. The effects of past and present grazing management, logging practices and road construction have resulted in degraded stream reaches that cannot support Apache trout populations that could be considered recovered. Of the 18 creeks on the Forest identified by the Apache trout recovery team as critical to the recovery of the species, 14 specifically require habitat quality improvement. Overall, Apache trout streams on Tribal land have better habitat conditions. The recovery plan required that the Forest and the Tribal lands maintain 15 streams of self-sustaining Apache trout populations. Recovery cannot occur without the streams on the Forest, and these streams cannot be considered recovered until habitat conditions are improved significantly.

The Service has completed one consultation with the Forest concerning Apache trout habitat. The Westfork AMPR opinion was issued on December 4, 1992. Protective and enhancement measures for portions of Boggy, Centerfire and Wildcat Creeks were incorporated in that AMPR. Implementation of the AMPR is commencing in 1993. The current consultation includes the headwater areas of both Boggy and Centerfire creeks and will thus have an effect on the recovery of lower reaches of both streams.

Management actions that open or reduce canopy closure degrade the habitat of the Mexican spotted owl. Timber harvest in the southwestern forests has had significant impacts to the owl through loss of suitable habitat. Changes in competitor or predator levels as forests are fragmented has also been identified.

Numerous factors have contributed to the decline of the Arizona willow and degradation of its habitat, including: historic and present livestock grazing, water impoundments, recreation, road construction, elk grazing, timber harvesting in upper watersheds, fungal infection and establishment of exotic plant species. Galeano-Popp (1988) attributed the degraded condition

of Arizona willow on the Forest to livestock grazing and the associated impacts of livestock on riparian systems. However, the ecology of the high elevation riparian communities and the Arizona willow is extremely complex, and no single causative factor can be identified.

Effects of the Proposed Action
Allotment Management Plan Revisions

Direct and Indirect Effects

The goal of the AMPR is to provide recovery of the meadow, riparian, and stream habitats in the allotments. Reduced length of grazing use periods, restrictions on seasonality of use and enclosure of some critical meadow reaches from livestock or livestock and elk are the measures proposed to accomplish this goal. There are two primary components involved, vegetative recovery and stream stabilization.

Vegetative Recovery

The decision to continue grazing livestock on the three allotments has been made by the Forest. That decision results in certain effects to the land and water resource resulting from livestock use of the allotments. The AMPR provides the structure under which the grazing will take place and provides for evaluation of the effects of grazing.

The proposed AMPR would not reduce the stocking levels on any of the three allotments. The length of season of use for any allotment has also not been altered. Thus, the overall utilization by livestock of the allotments does not change as a result of the AMPR. Amounts of forage, water and spatial resources are committed to livestock use. This reduces the resources available to fish and wildlife species. Wildlife habitat is lost or degraded due to maintaining roads, developed springs, fences and other constructed features required to operate the livestock operation. These effects are not short-term, but continue through the life of the project.

With the creation of new pastures out of existing ones, average pasture size will decrease since there is no land base added to the allotments. Days of use per year will also decrease for each new pasture, although amount of forage utilized per pasture may or may not change. Forage utilization per pasture is a function of number of livestock, duration of use and size of the pasture. Forage selectivity by livestock also will continue to influence plant species diversity and seral stages on the allotment. Distribution of livestock across the pasture may change as a result of crowding, however, the availability of preferred forage species in areas of the allotment will also influence distribution. Thus, while overall forage utilization will not change (since there is no change in season or stocking levels), local utilization rates and selection pressure on desirable species is likely to change. Monitoring to measure use of desirable species is essential in setting proper duration of use to minimize adverse effects.

Under the current management, most pastures received one full year of rest in each cycle. Given the current rate of recovery of riparian and aquatic habitats, the existing management is not achieving Forest objectives in a timely manner. Significant levels of adverse impacts are continuing. The new plan would graze primary (non-riparian or "special emphasis") pastures every year, though for a shorter duration and at different times during the grazing season over the several year cycle. The length of the longest rest period for a particular pasture in a cycle is reduced, while length of the rest period in any use year is increased. Frequency of use (i.e. the number of times a plant is physically grazed) is lower since the livestock are in the vicinity of the plant for fewer days. Plants with slower regrowth rates are used less frequently than those that can regrow within the period of livestock use. Riparian plants tend to regrow more quickly than upland species. The shorter exposure periods in the riparian pastures are intended to reduce the frequency of use and thus reduce effects to the plants.

Species composition is also a factor in the way the forage base in a pasture can be used. The availability of desirable forage is not uniform throughout a pasture, resulting in some areas more likely to be used than others. The time of the season the pasture is used also affects the forage use since some plants are more desirable at certain times of the growing season than others. Unless management of livestock on a pasture can compensate for differences in forage desirability, overuse of the desirable species will continue to occur while less desirable species are not used. Seeding programs to change the species composition and provide more desirable forage are not successful in the long term if overuse of the desirable species continues.

Willows (*Salix* spp.) and other riparian shrubs have largely been eliminated from the meadow reaches of streams that once supported them. Overuse by grazing animals, drying of the bank areas from the lowering water table and loss from erosive events are contributing factors. Changes in grass and forb species composition is also evident, with non-native, invader species like Kentucky bluegrass and redbud dominating the meadows near the streams. Of native grasses once found in these areas, only tufted hairgrass, a species that can tolerate heavy grazing, remains at any significant level. Overuse on both hairgrass and the grazing-tolerant bluegrass has clearly occurred.

The biological evaluation for the AMPR provides only a brief analysis of the potential impacts of the project action on Arizona willow. Much of the discussion within the biological evaluation concerns the Apache trout and the expected improvements to stream and riparian habitats. Much of this discussion is applicable to the Arizona willow, and any improvement to Apache trout habitat will also be to the advantage of the Arizona willow. However, the ramifications of the ecological effects of livestock grazing to Apache trout is different than for the Arizona willow and its habitat.

As described in the biological evaluation, the proposed allotment management plan places a high priority on protecting existing occurrences of Arizona willow. Most known occurrences within the project area are proposed to be included within exclosures or small fenced plots. This perspective addresses ungulate predation on individual plants, but avoids addressing the associated

effects of livestock grazing on the constituent elements of the proposed critical habitat and the natural re-establishment of Arizona willow into high quality riparian habitats. Information strongly suggests that any grazing by livestock and/or wildlife retards or prevents reestablishment of willows. The proposed critical habitat in the project area that is still subject to livestock use may not be able to recover given the continued use by grazing animals. The monitoring plan included in the biological evaluation identifies utilization levels on woody vegetation in riparian zones as not more than 45% of the current years leader growth. This level of growth may not be appropriate in critical habitat. Monitoring transects will be read at five year intervals. This may represent an improvement in the existing grazing regime, but does not reflect priority management for the Arizona willow and its habitat.

The interaction of livestock grazing and Mexican spotted owls is not clear. Effects are likely concentrated in grazing related changes to the prey base of the owls, especially small mammals such as voles. This is an area of research that needs additional study. A probable pair was reported in 1991 and 1992 from an area of the West Fork of the Black River below the confluence with Stinky Creek. Another territory is near Big Lake, just outside of the project area. No roost or nest sites have been identified as of yet.

Stream Stabilization

The AMPR provides for five riparian pastures and four "special emphasis" wetland pastures. Of these, only the Hayground Creek riparian pasture is on an Apache trout stream. Three are on Burro Creek and one is on the East Fork of the Black River. None of the "special emphasis" pastures involve Apache trout. There is one livestock enclosure on upper Home Creek, and two livestock enclosures and one livestock-elk enclosure on Stinky Creek. Both of these streams are Apache trout streams. The remainder of the approximately 15 miles of Apache trout streams are in normal use pastures. The enclosures on Stinky Creek are located in Arizona willow proposed critical habitat. The remainder of the proposed critical habitat is in normal use pastures.

Home Creek is located in the Middle and Lower pastures of the Burro Creek Allotment. These pastures are part of the management area for the yearling herd. A 20 day use period for each pasture is contained in the AMPR grazing system for this allotment. The pasture plan and use record provided by the Forest shows that use of these pastures can occur in any month of the grazing season.

Stinky Creek is located in the Reservation pasture of the Burro Creek Allotment. Part of yearling herd, this pasture also has a proposed 20 day use. Use of this pasture may occur any time in the season.

Hayground Creek riparian pasture is on the Hayground Allotment and is proposed for five days use. The pasture plan shows this use is scheduled for the September/October period.

Centerfire Creek is in the Centerfire pasture on the Hayground Allotment and is proposed for 30 days use. The pasture plan shows that use of this pasture can occur at any time in the grazing season.

Boggy Creek is in the Boggy Pasture in the Reservation Allotment and is proposed for 25 days use, again at any time of the grazing season. The uppermost end of Boggy Creek is on the Hall pasture, proposed for 35 days of use anytime during the grazing season.

The biological evaluation prepared by the Forest indicates that May to June are dry months in the project area. The summer rains begin in July and may last into September, with a drying period into October. If the pasture plans as provided to the Service are used, livestock will be in pastures containing degraded Apache trout habitat during the time when stream banks will have higher moisture content and flows from runoff will increase. Bank damage is more likely to occur during these conditions. Shorter exposure times do reduce damage somewhat, however, most of the damage likely takes place in the first few days of livestock use. Although there is other forage available, and new waters are proposed, use of the riparian areas for both forage and water will likely remain significant.

The level of impact to stream banks is also a factor of substrate. Rocky banks are less prone to damage and deep alluvial soils are easily damaged. To assess the degree of risk, and the existing degree of damage, the Fish Management Reports for the Apache trout streams provide some baseline. Table 1 shows a summary of the pertinent HCI values for each stream and affected reach.

The reaches of Home Creek in the Middle and Lower pastures include Reaches 2 through 9. A portion of Reach 9 is in the livestock enclosure. Only one reach has good bank soil stability, however, the remainder are in the upper range for fair. Three reaches have fair readings for ungulate damage, the remaining six are in good condition.

Stinky Creek has one reach with good bank soil stability, two with readings in the upper fair range and one with only fair. Reach 4, the only reach to have fair readings for ungulate damage also has the lowest bank soil stability. The livestock and elk enclosures along this creek are not in Reach 4.

Hayground Creek has one reach with good bank soil stability, and one each at the upper and lower bounds of the fair designation. As with Stinky Creek, the only reach with fair ungulate damage, Reach 3, is the reach with the lowest bank soil stability. Reach 3 is in the Hayground Creek riparian pasture.

Centerfire Creek has a portion of one reach in the project area. Bank soil stability is only fair, as is ungulate damage. Boggy Creek also has only a portion of one reach in the project area. Both bank soil stability and ungulate damage are fair.

Table 1. Selected HCI parameters for Apache trout streams in the Burro Creek, Hayground and Reservation allotments.

Stream/Reach	Bank Soil Stability	Ungulate Damage
Boggy/R3*	58.8	30.0
Centerfire/R3*	55.0	27.0
Hayground/R1	74.2	9.8
/R2	80.8	16.9
/R3	47.5	59.0
Home/R2	70.8	26.6
/R3	75.0	27.6
/R4	74.2	20.7
/R5	73.8	21.0
/R6	75.4	20.8
/R7	80.0	17.9
/R8	75.0	20.5
/R9	72.8	26.5
Stinky/R1	87.5	8.3
/R2	70.0	24.3
/R3	75.0	12.6
/R4	60.0	42.0

Ranking:

Bank soil stability >80 Good; 40-79 Fair; <39 Poor
 Ungulate damage <25 Good; 26-50 Fair; >51 Poor

* Signifies there were no survey stations on the stream reaches in the project area. Data presented is from next nearest reach stations.

References: AGFD 1991a, 1991b, 1991c, 1991d, 1991e

In seriously degraded streams, any grazing use at all is not conducive to restoring stream features or riparian habitats. The five Apache trout streams in the project area are degraded, but no reach has values in the poor range for bank soil stability or ungulate damage. Because of the fair to good conditions, it may be possible to achieve stream and riparian recovery while allowing for moderate amounts of grazing. The AMPR does reduce the use period from current levels, this reduction may or may not be sufficient to provide adequate recovery rates. The same may be true for Arizona willow in the project area, especially in areas of proposed critical habitat still subject to livestock use.

Continued use of some of the more sensitive stream and riparian areas may not result in recovery of these areas within desired time frames. Reach 4 on Stinky Creek shows signs of significant damage by ungulates and has the lowest bank soil stability on that stream. The reduction in use may not be adequate to reverse this situation. Use of the riparian pastures, while of short duration, may have significant impacts on recovery processes.

Implementation of the monitoring program described in the AMPR will assist the Forest Service and other interested parties in evaluating the success of this project. The presence of elk on the allotments provides additional complicating factors. Elk do utilize the same forage base as do livestock, and they are found in the meadows and riparian areas during certain times of the year. How much effect elk have on vegetation and stream recovery potentials on the allotment is not clear but is under evaluation.

In summary, the change in grazing system in the AMPR does not reduce the actual numbers of livestock allowed per year, nor the length of the grazing season. The total amount of forage needed to support livestock also does not change. How that forage is used by livestock has changed. Seasonality, duration and frequency of use will be different for both upland and riparian/meadow areas under the AMPR. Whether the changes proposed in the AMPR are adequate to provide recovery for both will not be immediately known. Implementation of the proposed monitoring plan will be a critical part of accomplishing the project goals.

Effects to Survival and Recovery

There are a number of Apache trout populations on Forest and Tribal lands. The quality of those populations of Apache trout varies considerably. However, with the existing environmental baseline, the risks to the immediate survival of the species are not significantly increased by the AMPR. It should be noted that this AMPR covers three of the 42 allotments the Forest has pledged to revise to provide for endangered and threatened fish recovery. When this consultation is completed and the effects of the action become part of the updated environmental baseline, future Federal actions will be considered in light of that revised status.

The AMPR would have little effect on the type of recovery actions accomplished to date, namely removing non-native trout from streams designated for Apache trout. It does have effects on the improvements needed

to provide a recovered physical habitat for those populations. The Recovery Plan (USFWS 1983) clearly states that to delist the species, 30 self-sustaining populations are required. To achieve this goal, habitat conditions in critical streams must be improved.

Since the effect of livestock grazing upon Mexican spotted owls is unclear, the magnitude of that effect cannot be predicted. However, maintaining a healthy prey base is essential for the long-term success of the owl. This question must be examined further.

Under the AMPR, some Arizona willow populations and proposed critical habitat will still be subject to livestock grazing. We do not know at what level this use would be safe and promote growth and recovery of the populations. Use of the entire pasture by livestock, versus overuse of the riparian areas, could be an important component in determining the acceptable level of use.

Cumulative Effects

Cumulative effects are those effects of future State or private activities that have no Federal connection, that are reasonably certain to occur within the action area of the Federal action subject to consultation. The action area is entirely on Federal land, although there is a non-Federal parcel on the Burro Creek Allotment that contains proposed critical habitat for the Arizona willow. Private actions on that land that affected the willow would be cumulative effects. Actions taken to manage wildlife on the allotments are initiated by AGFD, but the Forest has some oversight, thus there is likely to be a Federal connection. Use of funds from Federal Aid to Fish and Wildlife Enhancement and Section 6 of the Act distributed through the Service to AGFD also provides an additional opportunity for a Federal connection. Under these circumstances, there is only a very limited opportunity for any cumulative effects in the action area.

Recreational fishing on the allotment is an area where there may be some cumulative effects to examine. Stocking and other management actions are likely to have a Federal connection, but the actual use of the allotment streams by anglers may not.

Summary of Effects

The proposed AMPR was designed to be an improvement over the existing grazing system on the allotments. It does not completely eliminate degradation of Apache trout and Arizona willow habitats and support recovery of the populations. The actual degree of improvement resulting from the new grazing system to the upland watershed, meadow and riparian areas cannot be predicted. The AMPR assumes that riparian pastures are the correct approach for White Mountain stream recovery goals. Information exists in the published and grey literature that both support and refute that assumption. Effective monitoring programs and long-term research are needed to clarify this issue for the White Mountains.

Effects of the Action
Coldwater Fisheries Enhancement Project

Direct and Indirect Effects

For Arizona willow, any actions that can affect the streambanks may have an affect upon existing populations and the potential for areas to support the species. Construction of instream structures could cause bank disturbances. Of special concern is the critical habitat area along West Fork of the Black River and Thompson and Stinky creeks. Construction of trails and other recreational facilities as part of the project should avoid occupied and potential habitats. Overuse of access points may be a contributing problem if angler use increases significantly.

Implementation of this plan will provide some benefits for the Apache trout in the form of increased and improved habitats and recognition of the species from the blue ribbon fishery. Fostering the populations of brown trout as part of the project does preclude restoration of the entire drainage for Apache trout. This is not permanent and a change of management could be accomplished in the future. Continued monitoring of unauthorized stockings of fish from the brown trout area to both existing and proposed Apache trout areas will be needed.

Effects to Survival and Recovery

As stated above, the designation of the blue ribbon fishery, habitat improvements and protective management may, if successful, provide some long-term benefits to Apache trout.

Use of the proposed critical habitat as part of a recreational fishery may or may not have any effects to the Arizona willow. Much depends upon the use patterns by anglers and identification of sensitive areas prior to any construction.

Cumulative Effects

See previous discussion.

Incidental Take

Section 9 of the Act, as amended, prohibits the taking (harass, harm, pursue, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species without a special exemption. The concept of harm includes significant habitat modification and degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding and sheltering. Case law has affirmed that taking does include harm to listed threatened species when there is definable injury or death to individuals. Under the terms of Section 7 (b) (4) and Section 7 (o) (2), taking that is incidental to, and not intended as

part of the agency action, is not considered taking within the bounds of the Act, provided such taking is in compliance with the incidental take statement provided in the biological opinion.

The Service has determined that Apache trout stream habitat on the Allotment has been harmed by past management practices. This represents five of 18, or approximately 28% of the critical recovery streams on the Forest. These streams will continue to be harmed by the implementation of the AMPR. The Service fully understands that the purpose of the AMPR is to improve the condition of the habitat in these three streams. The AMPR pledges to maintain the HCI at least 60% of maximum, thus providing a loss of up to 40% potential habitat. Improvements in physical habitat conditions are the basis for the change in management; however, sedimentation will continue to affect trout spawning and feeding habitats in these streams, runoff events will continue to erode stream banks and some level of mechanical damage will occur to streambanks. This is likely to adversely affect stream channel recovery and reestablishment of riparian vegetation. Protection of part of the streams by exclosures does not address the total potential for adverse impacts to the habitat. We recognize that these habitat conditions are in existence and are not newly created. However, the decision to allow livestock grazing on the allotments under the AMPR is also the decision to continue to take Apache trout habitat and prevent full recovery of the habitat.

The effects of grazing on the small mammal, bird and reptile populations that form the prey base of the Mexican spotted owl have not been determined. Timber harvests likely have more significant direct effects on the habitat than does grazing due to the opening of the canopy and elimination of habitat structure.

Incidental take is not set for proposed species or critical habitat. Therefore, no incidental take statement is included in this biological opinion for the Arizona willow. Under the Act, take for plants is not the same as take for animal species. Under some instances, take of plants is covered by the Act when Federal land is involved.

Where possible, the Service is required to specify the amount of incidental take that will occur. This specification is necessary to define when the level of incidental take has been exceeded. The AMPR, through the Plan, allows for a level of take of up to 40% of HCI. This level was set during consultation on the Plan and Amendment 1. Of the five Apache trout streams in the project area, only Stinky Creek has an overall HCI of over 60%, and this creek does have one reach with a HCI of less than 60%. Only one reach on Hayground Creek exceeds 60%, the rest of the reaches on the four remaining streams are less than 60%. Since there are HCI values less than 60%, the incidental take of the AMPR is already exceeded. This situation will continue until the habitat improves sufficiently to provide HCI values of greater than 60%.

Owing to the lack of information on the effects of livestock on the prey base of the Mexican spotted owl, it is not possible to determine a limit for the incidental take.

The Service considers that the level of incidental take for Apache trout for the proposed AMPR will continue to be exceeded when at the third year of implementation of the AMPR, specified monitoring of the recovery of exclosed areas, riparian pasture and normal use pasture stream reaches shows that equivalent recovery is not occurring between the treatments. Equivalent recovery is defined as equal or greater recovery of stream conditions as measured by HCI in normal and riparian pasture streams as compared to exclosed (livestock) streams. Measurements to determine recovery rates for riparian pasture streams will not be taken from any livestock or livestock/elk exclosure on those streams. At the end of the first grazing cycle, incidental take will continue to be exceeded if riparian and stream recovery in normal use pastures is measurably less than in the riparian pastures and/or recovery in the riparian pastures is measurably less than in the livestock exclosures. Measurably less is defined as a greater than 20% disparity in recovery rates.

The Service does recognize the need to define appropriate riparian and stream restoration concepts for the White Mountains. There is considerable disagreement among the interested parties as to which concept or concepts provide for the most timely and effective recovery of these systems. The published and grey literature do not clearly resolve this question for all parties. Determining an effective course of action to recovery Apache trout habitats in the White Mountains is essential to the ultimate success of the recovery program.

There is no incidental take level set for Apache trout for the CFEP due to the no affect finding and concurrence. However, there may be some losses attributed to placement of structures in Apache trout streams under the AMPR. This take may be in the form of loss of individuals and disturbance of existing habitat. It is not possible at this time to know the level of incidental take likely to occur from these projects, however it is not likely to be high. To have a limit to use for management decisions, the Service shall consider the incidental take to have been exceeded if more than 20 Apache trout are killed during instream work in any single stream, or if over 40 are killed during a whole season's work on more than one stream.

The measures described below are not discretionary and must be undertaken by the agency as part of the implementation of the proposed action or made a binding condition of any permit or other implementation document given to or developed by the applicant, as appropriate.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take authorized by this biological opinion:

1. Measures will be taken to ensure that monitoring of AMPR implementation is fully accomplished and scientifically sound and will provide information to effectively compare rates of recovery in normal use and riparian pastures and livestock exclosures to Apache trout habitat recovery.
2. Measures will be taken to ensure timely protection for Apache trout streams on the allotments from existing livestock grazing use.
3. Measures will be taken to ensure that the level of incidental take currently in existence does not continue.
4. Measures will be taken to monitor the brown trout fishery in the West Fork of the Black River so problems with this fishery does not begin to adversely affect the Apache trout streams.
5. Measures will be taken to evaluate the effects of livestock and elk grazing on the prey base of the Mexican spotted owl.

Terms and Conditions

In order to be exempt from the prohibitions of Section 9 of the Act, the Forest must ensure the applicant's and their own compliance with the following terms and conditions which implement the reasonable and prudent measures described above.

1. To implement reasonable and prudent measure 1, the following terms and conditions will be implemented.
 - a. The Forest will fully implement the monitoring called for in the AMPR in every year grazing is allowed on the allotments. Failure to implement the monitoring as prescribed requires the livestock to be removed immediately from the particular allotment or allotments where monitoring was not carried out properly.
 - b. If, in the first three years of the new AMPR grazing cycle, information developed supports the acceptance of one stream and riparian restoration concept over the others, revisions to the AMPR to incorporate that concept more widely will be accomplished within the succeeding two years.
 - c. The Forest will, if necessary, explore alternative funding sources for any monitoring required if funding from within the agency is not available or sufficient to meet the needs. Lack of funds will not be considered as an impediment to the implementation of proper monitoring.
 - d. The Forest will provide reports of the monitoring done the previous year to the Service before the start of the next years grazing season.

- e. The Forest will ensure that the permittee follows the requirements of the AMPR each year livestock is grazed on the Allotment.
2. To implement reasonable and prudent measure number 2, the following terms and conditions will be implemented:
 - a. The Forest, in scheduling construction and development projects needed to implement the AMPR, will give first priority to the construction or reconstruction of fences for riparian pastures and exclosures (both elk/livestock and livestock) on or containing Apache trout streams. These fences will be in place within 2 years of the Record of Decision being finalized.
 - b. The Forest will use any available funding source to build the riparian pasture and exclosure fences on the allotments. Lack of funds will not be considered as an impediment to the placement and maintenance of these fences.
 - c. In the event of any damage to the exclosure fences that would allow livestock and/or elk access to exclosure areas or riparian pastures containing Apache trout, repairs will be made immediately if livestock are in that pasture or before livestock enter that pasture in that year. Immediately is defined as within 2 days of discovering the fence damage. If repairs cannot be made, livestock are to be removed within an additional 2 days or methods taken to prevent their access to the exclosure or riparian pasture and amount of damage to the exclosure estimated. These fences will be inspected every year and any repairs needed made before the pasture is used by livestock.
 - d. If use of a particular pasture results in significant damage to any Apache trout stream or riparian area, use of that pasture will be halted and additional protection will be provided before the pasture can be used again for livestock. Significant damage includes, but is not limited to, excessive utilization of forage or unacceptable levels of mechanical damage that eliminate or significantly reduce achieved recovery.
 3. To implement reasonable and prudent measure 3, the following terms and conditions will be implemented:
 - a. Unless delays to implementation of the AMPR are agreed to by the Service, implementation of this AMPR will begin in 1994 and be completed within 5 years.
 - b. If delays in the implementation are approved by the Service, livestock grazing on the allotments may continue under the present system, except in pastures containing reaches of Apache trout streams with HCI values of less than 60%. In those pastures, use levels will not exceed those set in this AMPR.

- c. Increasing livestock use of any riparian pasture or normal use pasture containing Apache trout habitat will not occur until the fully implemented AMPR has been in operation for one full grazing cycle (five years). After that point, increases may be considered in the Annual Operating Plan, but the pasture will be monitored closely and if recovery rates are not maintained, the use must return to the original level. The decision to decrease livestock use will be made and implemented at any time that data shows recovery rates to be insufficient or retarded by the grazing use.

4. To implement reasonable and prudent measure 4, the following terms and conditions will be implemented:

- a. As part of the public information on the new fishery, anglers should be discouraged from moving brown trout around in the drainage.
- b. Barriers needed to protect Apache trout streams shall be in place within 2 years of the start of the project.
- c. Apache trout streams will be monitored for the presence of brown trout and any increase in that presence.
- d. All work on instream structures in Apache trout streams will be done in such a way to minimize the potential for taking individual fish.

5. To implement reasonable and prudent measure 5, the following terms and conditions will be implemented:

- a. The Forest will work with the Service, AGFD and other interested parties to develop information on the effects of grazing on the prey base of the Mexican spotted owl.

Reporting Requirements

The Forest will, at a time mutually agreed upon, provide the Service with a yearly maintenance record for important fences and an annual report of the monitoring activities.

If, during the course of the action, the amount or extent of the incidental take is exceeded, the Forest must reinitiate consultation with the Service immediately to avoid violation of Section 9. Operations must be stopped in the interim period between the initiation and the completion of the new consultation if it is determined the impact of the additional taking will cause and irreversible and adverse impact on the species. The Forest will provide an explanation of the causes of the taking. Greater than anticipated incidental take will be identified as occurring if monitoring of the allotments shows that at the end of the first grazing cycle, riparian and stream recovery in normal use pastures is measurably less than in the riparian pastures and/or recovery in the riparian pastures is measurably less than in the livestock exclosures. Measurably less is defined as a >20% difference in recovery rates.

Conservation Recommendations

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's Section 7 (a)(1) responsibility for the species.

The Service recommends the following actions for the Arizona willow:

1. Monitor riparian zone woody vegetation to limit utilization levels to not more than 25% of the current years leader growth within all reaches of proposed critical habitat.
2. Read monitoring transects within proposed critical habitat reaches at three year intervals (not including the paired livestock-elk exclosures), and reviewing these results to any make appropriate changes in livestock management.
3. Please report the results of all monitoring efforts for the Arizona willow completed as part of this allotment management plan to the Service each year. With the data provided on individual Arizona willow plants outside of ungulate exclosures, please describe livestock stocking rates and dates livestock occurred within the pastures.

The Service recommends the following actions for the Apache trout:

1. Fence Reach 4 of Stinky Creek to eliminate livestock use.
2. Revise the AMPR to eliminate planned livestock grazing in all riparian pastures with Apache trout habitat.
3. Identify, reconstruct or close unneeded roads on the allotments to reduce this source of sediment inflow to the streams.
4. Explore the opportunity to modify the Plan Standard and Guideline to set a higher minimum HCI.
5. Explore methods to further define the appropriate livestock herd size for the allotments.

The Service recommends the following actions for the Mexican spotted owl:

1. Continue to survey project area to locate roosts and nest sites.

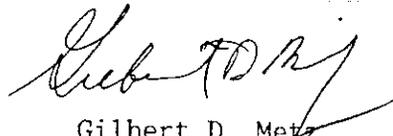
Conclusion

This concludes formal consultation on the Burro Creek, Hayground and Reservation Allotment Management Plan Revision and the Coldwater Fisheries Enhancement Program, as outlined in your March 24, 1993 request. As required by regulations (402.16), reinitiation of formal consultation is required if: 1) the amount or extent of incidental take is exceeded, 2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion, 3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion, or 4) a new species is listed or critical habitat designated that may be affected by the agency action.

The Service would appreciate notification of your final decision on this action. We also remind the Forest that the terms and conditions to implement the reasonable and prudent measures are mandatory and must be implemented and reports provided as required. In order for the Service to be kept informed of actions that either minimize or avoid adverse effects, or that benefit the listed species or their habitats, the Service would appreciate notification of the implementation of any conservation recommendations by the Forest.

Thank you for assisting us in the conservation of endangered and threatened species. In future communications on this project, please refer to consultation number 2-21-90-F-120. If we may be of assistance, please contact Lesley Fitzpatrick or Tom Gatz.

Sincerely



Gilbert D. Metz
Acting State Supervisor

cc: Chief, Fish and Wildlife Service, Arlington, Virginia (DES)
Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico
(AES)
Project Leader, Fish and Wildlife Service, Fishery Assistance Office,
Pinetop, Arizona
Forest Supervisor, Apache-Sitgreaves National Forest, Springerville,
Arizona
District Ranger, Springerville Ranger District, Apache-Sitgreaves
National Forest, Springerville, Arizona
Director, Arizona Game and Fish Department, Phoenix, Arizona

Literature Cited

Arizona Game and Fish Department. 1991a. Boggy Creek Fish Management Report. Statewide Fisheries Investigations, Survey of Aquatic Resources, Federal Aid Project F-7-M-33. Phoenix, Arizona. 36pp.

_____. 1991b. Centerfire Creek Fish Management Report. Statewide Fisheries Investigations, Survey of Aquatic Resources, Federal Aid Project F-7-M-33. Phoenix, Arizona. 50pp.

_____. 1991c. Hayground Creek Fish Management Report. Statewide Fisheries Investigations, Survey of Aquatic Resources, Federal Aid Project F-7-M-33. Phoenix, Arizona. 29pp.

_____. 1991d. Home Creek Fish Management Report. Statewide Fisheries Investigations, Survey of Aquatic Resources, Federal Aid Project F-7-M-33. Phoenix, Arizona. 26pp.

_____. 1991e. Stinky Creek Fish Management Report. Statewide Fisheries Investigations, Survey of Aquatic Resources, Federal Aid Project F-7-M-33. Phoenix, Arizona. 24pp.

Galeano-Popp, R.G. 1988. Salix arizonica Dorn. on the Apache-Sitgreaves National Forest: inventory and habitat study. Unpublished report, Apache-Sitgreaves National Forest. 47 pp.

Ganey, J.L. 1992. Food habits of Mexican spotted owls in Arizona. Wilson Bulletin 104(2):321-326.

U.S. Fish and Wildlife Service. 1983. Arizona Trout (Apache Trout) Recovery Plan. Albuquerque, New Mexico. 40pp.

_____. 1992. Endangered and threatened wildlife and plants; proposed endangered status for the plant Salix arizonica (Arizona willow), with critical habitat. 57 Federal Register 54747.