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AESO/SE
02-21-05-F-0640

May 12, 2006

Ms. Elaine J. Zieroth
Forest Supervisor
Apache-Sitgreaves National Forests
P.O. Box 640
Springerville, Arizona 85938-0640

RE: Eagar South Wildland Urban Interface Project

Dear Ms. Zieroth:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated August 9, 2005, and received by us on August 10, 2005. At issue are impacts that may result from the proposed Eagar South Wildland Urban Interface Project located in Apache County, Arizona. The proposed action may affect the Little Colorado spinedace (*Lepidomeda vittata*) and its critical habitat.

For the majority of species in the action area, analyses of effects are being completed under the Section 7 Counterpart Regulations of the Endangered Species Act (68 FR 68254, December 8, 2003) and the March 3, 2004, Alternative Consultation Agreement between the USDA Forest Service, FWS, and National Marine Fisheries Services and described in 50 CFR §402.33. Those species considered within the framework of the Counterpart Regulations are not addressed in this biological opinion.

This biological opinion is based on information provided in the November 2, 2005, biological assessment and evaluation (BAE), telephone conversations with Kathryn McMillan, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, fuel reduction treatments and their effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

- August 8, 2005: We received the draft BAE by fax.
- August 9, 2005: The Forest requested formal consultation for the proposed Eagar South Wildland Urban Interface Project.

- September 12, 2005: We sent a 30-day letter initiating formal consultation. The letter noted that the consultation period would end on December 23, 2005.
- August 31, 2005: Conference call with Forest Service and FWS staff regarding the Eagar South WUI and the Nutrioso WUI.
- September 22, 2005: Meeting with Forest Service and FWS staff regarding cumulative effects of Eagar South WUI and the Nutrioso WUI. Discussions focused on the timing of treatments in the Rudd/Nutrioso 6th code watershed.
- November 17, 2005: We received a revised BAE for the Eagar South WUI Project. Included in the BAE was a commitment to limit treatments in the Rudd/Nutrioso 6th code watershed in order to minimize effects to Little Colorado spinedace. The revised BAE has changed the due date for the biological opinion to April 1, 2006.
- December 29, 2005: A draft biological opinion was sent to the Forest.
- April 14, 2006: The Forest Service responded to the draft biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is to reduce fuel loads adjacent to the Eagar South wildland urban interface in order to protect life, property, and natural resources, including rare species' habitats. The majority of the proposed action follows management direction, standards, and guidelines of the Apache-Sitgreaves National Forests (ASNF) Plan for protection of property and resources. The fire-behavior objectives will be accomplished by thinning and treatment of created and existing fuels on the ground using various methods (i.e. pile and burn, broadcast burning, lop and scatter, removal, and re-occurring maintenance burns or fire use) over a 15-year period. It is probable that mechanical treatments and pile burning can be completed within the first 8-10 years, followed by prescribed burning across the project area. Following the initial burning of an area, maintenance burns may be needed in order to meet fuels-reduction objectives. Burning of project areas utilizing cool burns may occur up to three times during the 15-year life of this project. Proposed treatments are summarized in Table 1 and correspond with the project map in Appendix A.

Table 1: Proposed treatments for Eagar South WUI¹

Definition of abbreviations used in Table 1:

AJ = alligator juniper	drc = diameter root collar	PS = Presettlement trees
BA = basal area	MC = mixed conifer	R = replacement
dbh = diameter breast height	PnP = pinyon pine	PP = ponderosa pine
dib = diameter inside bark	VSS = vegetative structural stage	

TREATMENT	VEGETATION	SLASH
<p>1 PJ Slopes < 50% 8,947 acres</p>	<p>Target crown spacing for conifers will be 20' – 35' between trees as needed to promote fire-resilient stands. All PnP >12" drc, and all PP > 16" dbh will be left unless removal is needed to promote a fire-resilient stand. Species preference for leave trees in descending order is: PP, AJ, PnP, all other juniper species. Where feasible, strips up to 15 acres will be opened to promote forb production for ungulate winter habitat. Areas may be treated with periodic prescribed burns.</p>	<p>Slash may be mechanically treated, lopped and scattered, piled, burned or used for soil stabilization. Boles > 3.9" in diameter will be removed where feasible. All snags within 300' of key fire control roads will be removed, beyond this conifer snags <12" dbh will be removed.</p>
<p>2 PP, PJ, or MC Slopes >40% or Inaccessible 3,233 acres</p>	<p>Areas may be treated with periodic prescribed burns.</p>	<p>Prescribed fire.</p>
<p>3 PP Slopes <40% With PAC 102 acres</p>	<p>Follow Apache-Sitgreaves National Forests Plan standards and guidelines. This will involve removing conifers <9" dbh. Areas may be treated with periodic prescribed burns.</p>	<p>Boles >3.9" dib from the thinning will be removed from the project area. Created and residual slash will be mechanically treated, removed, piled, burned, or utilized for soil stabilization.</p>
<p>4 PP Slopes <40% Within Post-Fledging Family Areas (PFA) for Goshawks 1,052 acres</p>	<p>Target basal area for conifers in VSS 3 groups is 50. Target basal area in VSS 4, 5, and 6 groups is 80. In areas less than 50 or 80 basal area, respectively, conifers 3' tall and 4.9" dbh will be retained and spaced 20'-25' from existing trees. Areas may be treated with periodic prescribed burns.</p>	<p>Boles >3.9" dib from the thinning will be removed from the project area, where feasible. Created and residual slash will be mechanically treated, removed, piled, burned, or utilized for soil stabilization. All snags within 300' of key</p>

¹ * Note: Acres of treatment represent the gross area of stands within each treatment type. Stand boundaries are an imperfect delineation with many stands including unique vegetative and physical landscape features and irregularities that are too dispersed and/or too small in spatial extent to map as separate stands. This includes clumps of minor species, seeps and springs, rock outcrops, ravines, brush thickets, and natural openings. Silvicultural treatment prescriptions are not applied on these unique and diverse features. Treatments are also not applied universally within the majority of the stand condition. For example, the ponderosa pine thinning will be directed at the dense groups or clumps within each treatment stand, but there are areas within many of these stands that are already at or below the target residual basal area that will not be treated. Some mitigation measures also limit the total application of treatment prescriptions over any given area. The net result is a mosaic of treatment that may actually only occur on about three-fourths of the gross area of the stand. But because the full extent and frequency of these anomalies are not mapped or tracked, planning and analysis will be based upon the gross treatment acres.

TREATMENT	VEGETATION	SLASH
		fire control roads will be removed, beyond this conifer snags <12” dbh will be removed.
<p>5 PP Restoration Presettlement Slopes <40% 3,559 acres</p>	<p>All presettlement trees will be retained; younger trees within competitive distances will be removed unless needed for restoration. Replacement trees will be identified based on remnant evidence. A range of 1-6 R trees will be left to replace each remnant tree evidence (snags, stumps, or logs). This will result in tree densities ranging from 25-280/acre. Only small areas will retain stocking levels of 280 trees/acre. Areas may be treated with periodic prescribed burns.</p>	<p>Boles >3.9” dib from the thinning will be removed from the project area. Created and residual slash will be mechanically treated, removed, piled, burned, or utilized for soil stabilization. All snags within 300’ of key fire control roads will be removed, beyond this conifer snags <12” dbh will be removed.</p>
<p>6 Grasslands: Restore Grasslands & Maintain openings Slopes <40% 4,169 acres</p>	<p>Grassland restoration is designed to promote and restore open grassland conditions. All presettlement trees will be retained. All other trees encroaching on meadows can be cut. Areas may be treated with periodic prescribed burns.</p>	<p>Slash may be mechanically treated, lopped and scattered, piled, burned or used for soil stabilization. Boles >3.9 inches in diameter will be removed where feasible.</p>
<p>7 Riparian: Water Canyon 67 acres</p>	<p>Understory thinning of PP, PnP, and juniper to reduce coniferous species within the floodplain and channel of Water Canyon drainage. All PnP >12” drc, all juniper species >16” drc, and all PP >16” dbh will be untreated. Conifers that provide streambank stability would be maintained regardless of size.</p>	<p>Boles >3.9” dib from the thinning will be removed from the project area, when feasible. Created and residual slash will be mechanically treated, piled, burned, utilized for soil stabilization and removed where feasible.</p>
<p>8 Riparian: Springs/Seeps 16 sites Approx 50 acres Included in Portions of other Treatment areas</p>	<p>Understory thinning of PP, PnP, and juniper to reduce coniferous species and restore riparian habitat. All PnP >12” drc, all juniper species >16” drc, and all PP >16” dbh will be untreated.</p>	<p>Slash may be lopped, scattered, piled, burned, or mechanically treated and removed where feasible.</p>

Total acres proposed for treatment ~ 21,129 acres

The Forest provided a generalized treatment schedule (Kathy McMillan, Forest Service, pers. comm. September 9, 2005). The Forest estimates that the ponderosa pine treatments (treatments 3, 4, 5, and part of 7) will be split between two years with approximately 5,000 acres treated each year. Treatments 1, 6, part of 7, and 8 are funding-dependent and therefore the Forest may treat 2,000 acres a year depending on funding. The Forest estimates that there will be approximately 2,000 acres of broadcast burning a year. This would total 30,000 acres of broadcast burning over the 15-year project. However, some acres may be burned up to three times while other acres may not be burned at all during the life of the project. Additionally, the Forest estimates that approximately 1,000 acres of pile burning will occur every year. Pile burning will occur 1 to 3 years after the treatment.

Due to potential impacts identified by our office with the adjacent Nutrioso WUI project, the Forest has committed to limit the amount of acres treated in the Rudd/Nutrioso 6th Code Watershed to 2,000 acres per year between the two projects (Eagar South WUI and Nutrioso WUI). This will reduce total mechanical treatments within the Nutrioso Creek/Rudd watershed to no more than 10% of the watershed in any given year.

There are a total of 110 miles of roads within the WUI area that can be utilized during treatments. In order to gain access to several of the proposed treatment areas, Maintenance Level 1 roads will need to be re-opened. Some of the roads will require a level of reconstruction in order to be utilized for thinning treatments. These roads will be closed again when fuels treatments have been completed.

Overview of Best Management Practices (BMP's) Related to Prescribed Treatments

Riparian

Best Management Practice #1 – Use of Project Maps

- Streamside Management Zones (SMZs) shall be designated along intermittent and perennial stream channels.
- Unless approved by the authorized FS Officer, there shall be no mechanized activities within the SMZ.
- Lead-out ditches or water-bars shall not be constructed in such a manner as to divert run-off into stream channels.
- Unless designated by the authorized FS Officer, debris generated from treatment activities will be removed from stream channels.
- Trees that may be removed from SMZs are those trees with exposed root systems that have lost their value in providing bank stability. Trees designated for removal shall be felled outside the stream channel. Trees, in or on the stream banks, with unexposed root systems that are providing bank and stream channel stability will not be removed.

Best Management Practice #2 – Riparian Treatment

- Non-riparian species within treatment areas 7 and 8 may be removed to reduce competition for desired woody and herbaceous riparian species.
- Created slash may be placed in minor drainages to aid in rebuilding of deeply incised gullies and headcuts or elsewhere as needed for erosion control.
- Ensure that sediment from disturbed areas does not directly enter the stream system through combinations of seeding of primarily native species, water-bars, wattles, or spreading slash.

Best Management Practice #3- SMZ Designation

- SMZ width is based on erosion hazard, existing vegetative groundcover conditions, stream bank and riparian conditions, natural geologic features, and presence of aquatic threatened and endangered species. SMZ restrictions do not apply to treatment area 7 (Water Canyon). SMZ widths shall be designated as follows:
 - Moderate to Severe erosion hazard = 150 feet (slope distance) on both sides of the stream course beginning at the high water mark within the stream channel, or modified as needed to best feasibly protect specific streams/reaches. Based upon erosion hazard, Milligan Creek is identified as a 150-foot SMZ .
 - For intermittent and perennial reaches not meeting the Apache-Sitgreaves National Forests Land and Resource Management Plan Standards for Management Area 3, SMZ widths shall be 150 feet (slope distance) on both sides of the stream course, based on stream bank and riparian condition.
 - Intermittent and perennial stream reaches containing aquatic threatened and endangered species (South Fork Little Colorado River) = 300 feet (slope distance) on both sides for the stream course beginning at the high water mark within the stream channel, or modified as needed to best feasibly protect specific reaches.

Best Management Practice #4 – Ephemeral Drainages

- The water quality objective for harvest treatments within close proximity to ephemeral drainages is to provide for, or to retain sufficient amounts of ground cover to mitigate sediment input to stream system and to minimize the number of crossings to retain stream bank and stream bottom stability.
- No specific stream buffers are recommended for ephemeral drainages.

Best Management Practice #5 – Log Landing Location

- Log landings shall not be allowed in meadows, riparian areas, stream channels, and SMZs. The authorized FS Officer may authorize landings in these areas, if required. These treatment areas will be clearly designated on the project area contract map.

Best Management Practice #6 – Slash Treatments in Sensitive Areas

- Mechanical slash piling shall not occur in meadows, SMZs, and riparian areas.

Best Management Practice #7 – Wetlands, Springs, Seeps, and Meadow Protection During Tree Removal Activities

- These areas will be protected from treatment activities and include a 50-ft buffer that excludes mechanized equipment.

Best Management Practice #8 – Prescribed burning treatments

- Fire control lines shall not be constructed on slopes greater than 40% or within SMZs.
- Ignition shall be above slope breaks of active floodplain. Fire will be managed such that burning into streamside management zones is limited to 15% or less of the area identified as the SMZ.
- Livestock grazing will be coordinated with prescribed burning, especially relative to drainages and their floodplains. Livestock use may be deferred, if necessary, in order to establish grasses in sufficient quantity to carry fire, prior to burning, or to protect new growth after burning.

Best Management Practice #9 – Servicing and Refueling Equipment

- During servicing or refueling of equipment, pollutants shall not be allowed to enter any waterway, riparian area or stream course.

Uplands

Best Management Practice #1 – Limit the Operating Season

- Ground disturbing activities shall be limited to dry or solidly frozen soil conditions to reduce compaction and soil displacement that is associated with tree removal activities when soils are wet or saturated.

Best Management Practice #8 – Prescribed Burning in Sensitive Upland Soils

- Prescribed burning in steep and erosive soils shall not exceed low severity overall to avoid removal of critical ground cover.

- Prescribed burning in accessible moderate and severe erosion hazard soils shall not exceed low severity overall in order to retain critical ground cover.

A complete description of all BMPs can be found in the project file.

Description of the Action Area

For this consultation we are defining the action area to include the 21,129 acres outlined in Table 1 within the Eagar South WUI boundary plus some adjacent areas (Appendix A, Map 1). All of the areas included within the proposed project boundary will likely incur impacts related to smoke, noise, ground disturbance, increased sediment run-off, and other disturbances related to the prescribed treatments mentioned above. Outside of the Eagar South WUI boundary, the action area extends downstream (west) following Rudd Creek and Nutrioso Creek. Rudd Creek flows from the Eagar South WUI boundary into Nutrioso Creek below Nelson Reservoir. Milligan Creek flows from the southern Eagar South WUI boundary to Rudd Creek. Hobson, Coon, and Grapevine creeks flow from the Eagar South WUI to the Little Colorado River, which is the northern-most extent of the action area. In general, the Little Colorado River is the northern extent of the action area, while Nutrioso Creek is the eastern extent. Milligan Creek is the southern extent of the action area.

STATUS OF THE SPECIES AND CRITICAL HABITAT

The Little Colorado spinedace was listed as threatened with critical habitat designated on October 16, 1987 (USFWS 1987). Threats were identified as habitat alteration and destruction, predation by and competition with non-native aquatic organisms, and recreational fishery management. Forty-four stream miles of critical habitat were designated: 18 miles of East Clear Creek immediately upstream and 13 miles downstream from Blue Ridge Reservoir in Coconino County; eight miles of Chevelon Creek in Navajo County; and five miles of Nutrioso Creek in Apache County. Constituent elements of critical habitat consist of clean, permanent flowing water with pools and a fine gravel or silt-mud substrate.

The spinedace is a small (about 4 inch) minnow native to the Little Colorado River (LCR) drainage. This fish occurs in disjunct populations throughout much of the LCR drainage in Apache, Coconino, and Navajo counties. Extensive collections summarized by Miller (1963) indicated that the spinedace had been extirpated from much of the historical range from 1939 to 1960. Although few collections were made of the species prior to 1939, the species is believed to have inhabited the northward flowing LCR tributaries of the Mogollon Rim, including the northern slopes of the White Mountains.

Food habits of spinedace include chironomid larvae, dipterians, filamentous green algae, and crustaceans (Runck and Blinn 1993, Blinn and Runck 1990). Spinedace are late-spring to early-summer spawners (Blinn 1993, Blinn and Runck 1990, Miller 1961, Minckley 1973, Minckley and Carufel 1967) although some females have been found to contain mature eggs as late as October (Minckley and Carufel 1967). A complete discussion of the taxonomic, distributional, and life history information of the spinedace has been compiled in the Little Colorado Spinedace Recovery Plan (USFWS 1998).

Mitochondrial DNA work on the spinedace was initiated in the 1990s and indicated the existence of three sub-groups identifiable by geographic area (Tibbets *et al.* 1994): the East

Clear Creek drainage, Chevelon Creek, and the upper Little Colorado River including Nutrioso and Rudd creeks. The study concluded that the genetic patterns seen were likely the result of populations isolated and differentiated by both natural and human-caused events. The East Clear Creek and Chevelon Creek sub-groups are more individually distinctive, likely the result of a higher degree of isolation, and possess unique haplotypes. Individuals from the upper Little Colorado sub-group are more similar to each other. Possibly, until recent time, there was one population with considerable gene flow until various dams and diversions increased local isolation. The cause and exact time of the isolation of the three sub-groups are not known, but Tibbets *et al.* (1994) recommend that all of these populations be maintained to conserve genetic variation in this species.

As would be expected for a species adapted to fluctuating physical conditions, the spinedace is found in a variety of habitats (Blinn and Runck 1990, Miller 1963, Miller and Hubbs 1960, Nisselson and Blinn 1989). It is unclear whether occupancy of these habitats reflect the local preferences of the species or its ability to tolerate less-than-optimal conditions. Available information indicates that suitable habitat for the Little Colorado spinedace is characterized by clear, flowing pools with slow to moderate currents, moderate depths, and gravel substrates (Miller 1963, Minckley and Carufel 1967). Cover provided by undercut banks or large rocks is often a feature. Spinedace have also been found in pools and flowing water conditions over a variety of substrates, with or without aquatic vegetation, in turbid and clear water (Denova and Abarca 1992, Nisselson and Blinn 1991). Water temperatures in occupied habitats ranged from 58 to 78 degrees Fahrenheit (Miller 1963). Miller (1963) called the spinedace “trout like” in behavior and habitat requirements, and it is likely that prior to 1900 the spinedace used habitats now dominated by non-native salmonids.

As with most aquatic habitats in the southwest, the Little Colorado River basin contains a variety of aquatic habitat types and is prone to rather severe seasonal and yearly fluctuations in water quality and quantity. Both mountain streams and lower-gradient streams and rivers have provided habitat for the spinedace. Residual pools and spring areas are important refuges during periods of normal low water or drought. From these refuges, spinedace are able to recolonize other stream reaches during wetter periods. This ability to quickly colonize an area has been noted in the literature (Minckley and Carufel 1967) as well as in observations by others familiar with the species. Populations seem to appear and disappear over short time frames and this has made specific determinations on status and exact location of populations difficult. This tendency has been observed by both researchers and land managers (Miller 1963, Minckley 1965, Minckley 1973) and has led to concerns for the species' survival.

The spinedace is assumed to still occupy the streams it is known from historically (Chevelon, Silver, Nutrioso, East Clear Creek, and the LCR proper). However, populations are generally small and the true population size for any occupied stream is unknown due to the yearly fluctuations and difficulty in locating fish. Spinedace have a tendency to disappear from sampling sites from one year to the next and may not be found for several years. For example, the Silver Creek population was considered extirpated until fish were collected from the creek again in 1997. Although AGFD surveyed Silver Creek in 2003 and 2004, no fish have been located since 1997. This ephemeral nature makes management of the species difficult since responses of the population to changes within the watershed cannot be measured with certainty.

AGFD personnel surveyed several 328-foot transects in Nutrioso and Rudd creeks in spring 2005, with a single spinedace and a few speckled dace captured from Rudd Creek. A total of 7 spinedace were captured upstream of Nelson Reservoir. No spinedace were found below the reservoir, but many fathead minnow and green sunfish were captured.

Spinedace are currently considered rare in East Clear Creek (Denova and Abarca 1992). However, recent conservation actions in 2000 by the AGFD and the Coconino National Forest have led to the reintroduction of spinedace into three tributaries (Yeager Canyon, Houston Draw, and General Springs) of this drainage. Houston Draw and General Springs dried and have not been monitored, though it is believed these stockings were unsuccessful. Sampling of Yeager Canyon in October 2001 located seven young-of-the-year and eight adult spinedace. Yeager Canyon dried during the 2002 drought and these fish died.

Drought conditions have confounded cooperative recovery efforts for the Little Colorado spinedace in the East Clear Creek watershed. Recent inspections have found drying of the stream courses within the watershed. Of particular concern at this point are Dines Tank, West Leonard Canyon, and Yeager Canyon. The Forest Service, Fish and Wildlife Service, and AGFD salvaged spinedace from Dines Tank, West Leonard Canyon, and Yeager Canyon in 2002. A pool in Dane Canyon held water throughout the summer of 2002 and 57 of the spinedace salvaged from West Leonard Canyon were stocked into Dane Canyon in August 2002. On July 30, 2004, the AGFD stocked 49 adult and one young-of-the-year spinedace from the Flagstaff Arboretum pond into Bear Canyon Creek in the East Clear Creek drainage. In May 2005, AGFD translocated approximately 120 adult spinedace from the Flagstaff Arboretum to Dane and Bear Canyons (60 fish to each site). Prior to the stocking, surveys conducted the last five to ten years have not located spinedace in either Dane or Bear Canyon. We anticipate that the fish can re-establish in these streams.

During annual spring surveys in 2005, AGFD found one adult (gravid) female spinedace in East Clear Creek below the Blue Ridge Dam. This is the first time in many years that a spinedace has been documented below the reservoir. It is likely that the fish was flushed downstream following the heavy winter and spring precipitation.

Native fishes associated with spinedace include speckled dace (*Rhinichthys osculus*), bluehead sucker (*Pantosteus discobolus*), Little Colorado sucker (*Catostomus* sp.), roundtail chub (*Gila robusta*), and Apache trout (*Oncorhynchus gilae apache*) (USFWS 1998). The list of non-native fishes is much larger and includes species with varying degrees of incompatibility with the spinedace's long-term survival. The presence of non-natives was one of the primary reasons the species was listed, and may contribute to the disjunct distribution patterns observed and the spinedace's retreat to what may be suboptimal habitats. Non-native fish may compete with, prey upon, harass, and alter habitat utilized by native fish. In the last 100 years, at least ten non-native fish species have been introduced into spinedace habitats. These include rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*), and golden shiner (*Notemigonus crysoleucus*). Surveys in East Clear Creek have documented the presence of these three non-native species and brown trout (*Salmo trutta*) in the watershed (Denova and Abarca 1992). Data from research experiments and field observations indicate that at least the rainbow trout is a predator and potential competitor with the spinedace (Blinn *et al.* 1993).

Since the spinedace was listed, the Rudd Creek population was discovered. There is also one refugial population of East Clear Creek spinedace (located at the Flagstaff Arboretum),

totaling between 300 and 400 individuals. There are no refugial populations for the other two genetic sub-groups, although we expect to have a captive population established at Winslow High School for the Chevelon Creek genetic sub-group by 2006. All of the known populations have decreased since 1993 and drought conditions continue to put additional strain on all known populations.

Our information indicates that, rangewide, 19 formal consultations have been completed or are underway for actions affecting Little Colorado spinedace (Appendix B, Table 1). Adverse effects to Little Colorado spinedace have occurred due to these projects and many of these consultations have required reasonable and prudent measures to minimize effects of incidental take on Little Colorado spinedace. Overall, the species is declining.

ENVIRONMENTAL BASELINE [in the action area]

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

A. Status of the species and critical habitat within the action area

Rudd Creek

Spinedace occur in Rudd Creek, a northeasterly flowing second-order tributary to Nutrioso Creek, which is a tributary to the Little Colorado River. Rudd Creek flows primarily through ASNF-administered lands, although most of Reach 4 flows through Arizona Game and Fish property (Sipe White Mountain Wildlife Area). Rudd Creek is about 12.1 miles in length, with a drainage area of about 28 mi². Rudd Creek originates from spring flow in open meadow then flows alternately through meadow and canyon reaches until it terminates at the confluence of Nutrioso Creek. The Rudd Creek watershed ranges from spruce-fir to pinon-juniper vegetation types. Elevations range from 7,300 to 8,800 feet. The stream is narrow and shallow, with an average width of 5.9 ft and average depth of 0.3 ft. Rudd Creek was surveyed in 1994 utilizing General Aquatic Wildlife Study (GAWS) survey methodologies (Table 2). Of the eight stream reaches surveyed, Reaches 1-4 are in the action area for this project. Reaches 5-8 are upstream from the action area and are not discussed here. Information about these upstream reaches can be found in the BAE.

	Forest Plan Standard/ Guideline	Reach 1	Reach 2	Reach 3	Reach 4	Average Reaches 1-4
* HCI %	≥ 60	64.6	55.5	45.3	50.2	53.9
Streambank Soil/Vegetation Stability %	> 80	65.6	97.5	64	71.9	74.6
Canopy Density %	≥ 80	47	2	3	21	18.3
Substrate Embeddedness %	< 20	80	78.2	77.1	78.8	78.5
Stream Temperature	≤ 68° F	—	—	—	—	—
**BCI %	≥ 80	—	—	—	—	—
Riparian Condition	> 9	7	6	5	4	5.5

* HCI – The habitat condition index (HCI) is a multivariate rating of existing trout habitat quality.

** BCI – The Biotic Condition Index (BCI) indicates as a percentage how close an aquatic ecosystem is to its own potential.

— Information not available

Based upon survey results, the rating for most reaches are not available or do not meet Forest Plan Standards and Guidelines. Portions of the stream in the action area contain unstable banks and excessive instream sediment, mainly due to historical watershed and riparian conditions which allowed for downcutting of the stream channels. Current management in these areas includes removal of livestock grazing which aids in the recovery of these stream reaches (USFS 2005a). The 1994 GAWS survey included fish-collection data which are presented in Table 3.

Table 3: Number of native * and nonnative fish collected from Rudd Creek, 1994

Fish Species	Reaches
	1-4
* Little Colorado Spinedace	293
* Bluehead Sucker	117
* Speckled Dace	569
Rainbow Trout	
Brook Trout	

The 1994 counts of spinedace documented a small viable population of spinedace in Rudd Creek. Electroshocking surveys conducted in 2005 by the Arizona Game and Fish Department document only one spinedace in Rudd Creek below Sipes with approximately 3,280 ft sampled.

Nutriosio Creek

Spinedace occupy Nutriosio Creek, a north flowing third order tributary to the Little Colorado River. It flows primarily through ASNF-administered lands, although several miles of stream above Nelson Reservoir flows through private lands occurring in the vicinity of the town of Nutriosio. Approximately 5 miles of Nutriosio Creek from the Apache-Sitgreaves National Forest boundary upstream to Nelson Reservoir dam is designated critical habitat for the Little Colorado spinedace. Nutriosio Creek is about 22 miles in length, with a drainage area of about 167 square miles. It originates from spring flow in an open meadow then flows

alternately through meadow and canyon reaches until it terminates at the confluence of the Little Colorado River. The watershed ranges from spruce-fir to grassland vegetation types. The stream is narrow and shallow with an average width of 5.2 ft and average depth of 0.3 ft.

Survey records indicate that Nutrioso Creek was surveyed in 1994 utilizing GAWS survey methodologies (Table 4). Of the six stream reaches surveyed, only Reaches 1-2 are in the action area of the project. These reaches occur below Nelson Reservoir. The portion of stream immediately above Nelson Reservoir through the town of Nutrioso was not included in the 1994 survey since it occurred on private land. Based upon survey results, the ratings for both reaches do not meet Forest Plan Standards and Guidelines (Table 4). Portions of the streams in the action area contain unstable banks and excessive instream sediment, mainly due to historical watershed and riparian conditions which allowed for downcutting of the stream channels. Current management in these areas includes removal of livestock grazing which aids in the recovery of these stream reaches (USFS 2005a).

Table 4: Habitat Conditions from Nutrioso Creek. Reaches 1-2, 1994.

	Forest Plan Standard/Guideline	Reach 1	Reach 2
*HCI %	≥ 60	45.4	50.8
Streambank Soil/Vegetation Stability %	> 80	51.5	49.6
Canopy Density %	≥ 80	13.7	5.5
Substrate Embeddedness %	< 20	44.7	76.7
Stream Temperature	≤ 60 ° F	—	—
** BCI %	≥ 80	—	—
Riparian Condition	> 9	8	7

* HCI – The habitat condition index (HCI) is a multivariate rating of existing trout habitat quality.

** BCI – The Biotic Condition Index (BCI) indicates as a percentage how close an aquatic ecosystem is to its own potential.

— Information not available

While the 1994 GAWS surveys of spinedace documented a small viable population of spinedace (Table 5), electrofishing surveys conducted in 2005 by the Arizona Game and Fish Department indicate substantially fewer numbers found in Nutrioso Creek, below and above the reservoir. The surveys did not find any spinedace below Nelson Reservoir with 9,186 ft sampled and seven spinedace above Nelson Reservoir in 3,608 ft sampled.

Table 5: Number of fish collected from Nutrioso Creek, 1994

Fish Species	Reaches	Reaches ¹
	1-2 In the Action Area	3-6 Upstream of Action Area
* Little Colorado Spinedace	328	107
* Bluehead Sucker	1786	632
* Speckled Dace	855	72
Rainbow Trout	1	93
Brook Trout	1	4
Fathead Minnow	49	158
Green Sunfish		1
Cutthroat Trout		3

* Native Species

1 -- Reaches 3-6 were included in this table to show the numbers of non-native fish present upstream from the action area.

Although spinedace are known to be tolerant to a variety of habitat conditions, specific habitat tolerances related to turbidity have yet to be determined. Blinn and Runck (1990) measured turbidity in Nutrioso Creek at Correjo Crossing below Nelson Reservoir and found turbidity ranged from 18 Formazine Turbidity Unit (ftu) in mid-May to 250 ftu in mid-July. In contrast, upstream occupied reaches ranged from 5-12 ftu in May and 20-25 ftu in July. Both Nutrioso Creek and the downstream portion of the Little Colorado River which extends from the East and West Fork confluences to the Carnero Creek confluence are classified as not meeting water quality standards for turbidity >10 ntu (ftu) measured (USFS 2005a).

Little Colorado River

The LCR occurs downstream from the project area, but within the action area and occurs on both private and State lands. Water Canyon is the only perennial drainage in the project area that drains directly into the Little Colorado River. Streamflow from Water Canyon rarely reaches the LCR due to several impoundments on the Forest which diverts flow for irrigation purposes just above the Forest boundary. All other tributaries to the LCR found in the project area are ephemeral, with the majority of flows rarely reaching the LCR. This is due to the seasonal nature of the streamflows and the presence of irrigation diversions in the community of Eagar. During high flow events, predominately occurring in the spring, flows in Water Canyon and the other tributaries to the LCR will be capable of reaching the LCR downstream.

Although spinedace numbers are low this year in the Nutrioso and Rudd Creek drainages, off of the Forest, healthy populations of spinedace occur downstream in the Little Colorado River (USFS 2005a).

Critical Habitat

Critical habitat for the Little Colorado spinedace occurs within Nutrioso Creek downstream of Nelson Reservoir dam to approximately 5 miles downstream at the Apache-Sitgreaves National Forest boundary. The critical habitat within Nutrioso Creek comprises 11.4% of the total designated critical habitat for the spinedace and serves an essential role in the species' conservation. Constituent elements of critical habitat consist of clean, permanent flowing water, with pools and a fine gravel or silt-mud substrate. A turbidity study performed by the Arizona Department of Environmental Quality (ADEQ) in November of 1999 and January of 2000 indicates that the majority of the Nutrioso Creek meets turbidity standards; however, a portion of the stream from the town of Nutrioso to Nelson Reservoir (about 7 miles) violates the Nephelometric Turbidity Units standard (ADEQ 2000).

Water quantity is one of the limiting factors within critical habitat in Nutrioso Creek. Nutrioso and Rudd creeks are interrupted perennial drainages. In recent years drought conditions have affected the quantity of available spinedace habitat. Except during high spring flows and summer monsoons, most of the spinedace habitat below Nelson Reservoir is dry with the exception of approximately two miles below the reservoir. Nelson Reservoir seepage provides the majority of baseflow to Nutrioso Creek, below the reservoir. In the first mile below the reservoir the creek contains beaver dams which hold runoff and seepage from the dam in large pools. The second perennial mile contains small disjunct pools and some riffle areas down to Correjo Crossing. Below Correjo Crossing the reaches are dry except during the aforementioned wet conditions.

Similarly, upper Nutrioso Creek (above Nelson Reservoir and above the critical habitat) and Rudd Creek are seasonally dry in sections. Continued withdrawals of drought limited surface

flows associated with water rights by private individuals, groups, and government agencies in both Nutrioso and Rudd Creeks, will perpetuate low baseflows which may be inadequate to support viable populations of spinedace over the long term (USFS 2005a).

Little Colorado spinedace are not known to occur within the critical habitat portion of Nutrioso Creek. The lack of water is known to be a limiting factor within this portion of the creek as well as the presence of non-native fish and excess vegetation in pools. Arizona Game and Fish Department surveys between 1994 and 2000 indicate that Nutrioso Creek is not meeting ASNFs standards regarding satisfactory riparian condition, shade, siltation, and bank stability. The ASNF also indicated in their Nutrioso WUI BAE that the creek's incised channels and poor riparian condition will not adequately process large scale or chronic disturbances within its drainage (USFS 2005b). The presence of these factors and general absence of water clearly have a negative impact to the Little Colorado spinedace and critical habitat.

B. Factors affecting species environment and critical habitat within the action area

The Upper Little Colorado watershed has had many impacts in the last 20 years, both by humans and nature. During the past thirty years, wildfires of all sizes have burned in the watershed. The great majority of fires have been less than an acre. Within the Upper Little Colorado Watershed, approximately 5,464 acres of large fires have burned in the last 30 years on the Forest portion of the watershed, the largest of which, the Tragedy Fire (1971) burned approximately 4,360 acres.

There are 32 timber sales or related treatments that have been completed by the Forest, are under analysis, or could be completed in the future. A complete list of these projects can be found in Appendix B, Table 2. Incorporation of BMPs for soil and water conservation have been required on all timber sales and other activities since 1991. Effects from future timber activities are estimated to be below the established watershed threshold because of implementation of BMPs (USFS 2004).

There are currently 29 grazing allotments within the Upper Little Colorado 5th code watershed with a signed decision. Grazing is within capacity currently on approximately 36% of the Apache National Forest portion of the Upper Little Colorado Watershed, however, stocking rates are less than permitted numbers on many allotments for various reasons. Grazing is expected to be within capacity on all allotments by 2020. Recovery to satisfactory watershed conditions on capable range is expected within 1 to 2 decades after full implementation of grazing allotment decisions in most areas (USFS 2004).

The Upper Little Colorado watershed is used for many types of forest recreation. Fishing, hunting, dispersed camping, hiking, mountain biking, horseback riding, and motorized off-highway driving are common activities. Numerous roads are also found in the watershed. Within the Upper Little Colorado River watershed there are 494 miles of open roads, 133 miles of closed roads, and 134 miles of trails.

A number of the upcoming WUI projects on the ASNFs were consulted on under the 2001 Programmatic Biological Opinion. The Nutrioso WUI directly south of the action area for the Eagar South project is also under consultation. The Nutrioso WUI project area includes 41,758 acres of Forest Service lands. Eagar South may be affected by the Nutrioso WUI treatments including thinning trees to certain crown spacing, removing or not removing

boles, and treating existing and created slash using various methods (e.g., pile and burn, broadcast burning, chipping, removal, and re-occurring maintenance burns or fire use). Areas that cannot be treated mechanically, e.g., steep slopes (>25% in pinyon-juniper and >40% in other conifer types) will receive low-intensity prescribed burning.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The project should not result in any direct effects to Little Colorado spinedace since the treatments will not occur in occupied habitat. However, indirect effects are likely with the implementation of the proposed action. Effects to the species and its critical habitat will include changes in water quality and habitat structure from short-term increases in sediment delivery via channelized flows into occupied habitat and critical habitat. The short-term and long-term effects from the Eagar South WUI treatments will reduce the quality of substrate for spawning, reduce the quality of pool habitat, and reduce the quality and quantity of aquatic macroinvertebrates (a major food source for spinedace) in spinedace occupied and designated critical habitat. Smoke and noise disturbances generated from this project are not expected to adversely affect spinedace.

The majority of effects to Little Colorado spinedace will occur due to increased sediment input into Rudd and Nutrioso creeks from the proposed action. The “Big Ditch” intersects all runoff to the north of the project flowing into the Little Colorado River and will capture the majority of sediment generated from the proposed project. However, during large runoff events there will be adverse effects to Little Colorado spinedace within the Little Colorado River. Increased sediment runoff will be generated from road reconstruction, prescribed burning, timber stand thinning by hand or mechanical means, skidding and decking of logs, and on-site chipping and transport of tree boles and slash. These activities can have short-term and/or long-term direct effects on watershed function by exposing bare mineral soil, compacting soil, changing the permeability of soils, removing or disturbing ground cover, concentrating overland flows, changing distribution of snow pack, changing filtering capacity of riparian vegetation, reducing streambank vegetation, and various other direct effects (USFS 2005c).

The proposed treatments will likely adversely affect water quality, identified as a critical habitat constituent element, predominantly through increased turbidity and perhaps through increases in nutrient loading. Short-term increases in turbidity levels during spring runoff and summer monsoons could occur from the cumulative effects of road reconstruction, thinning, and prescribed burning activities. The spinedace Recovery Plan (USFWS 1997) states; “increased deposition of sediment in spinedace habitat is believed to be detrimental to long-term spinedace survival”. We believe the current input of sediment combined with the additional deposition of sediment and ash from mechanical and prescribed burning treatments will reduce the availability of spawning habitat for spinedace within Nutrioso Creek (including critical habitat) and Rudd Creek. All occupied habitats within the action

area could be affected including the Little Colorado River, Rudd, and Nutrioso creeks, though only Nutrioso Creek contains designated critical habitat.

Principle water quality impacts of the actions proposed would include increased short-term inputs of ash and sediment to stream channels crossing or adjoining the WUI area (USFS 2005d). Changes in water quality from nutrient loading may occur with the implementation of the proposed action; however, literature varies on the degree to which this may occur. Baker (1990) indicated that studies show that additional nutrients in streamflow after burning do not significantly impair the quality of surface waters for municipal purposes but more information is needed on effects to riparian communities. Gottfried and De Bano (1990) reported that although a 1981 prescribed fire conducted on the Alpine Ranger District in ponderosa pine habitat did statistically alter the concentrations of some nutrients in stream water, the changes were too small to adversely affect water quality. For the proposed action, water quality changes including short-term increases in turbidity are expected. Water quality declines are expected to occur for up to three years following mechanical treatments and up to two years after prescribed burning treatments (USFS 2005a). Since project activities may occur yearly for up to 15 years, at the same time that prescribed burning could occur, the duration of effects could be spaced over as long as 17 years. Implementation of BMPs to retain the filtering capacity of streamside buffer zones and of burn prescriptions to moderate the extent and severity of burns would likely reduce the input of ash levels, but significant watershed effects are still likely.

The proposed treatments will likely adversely affect channel morphology in Rudd and Nutrioso creeks. Channel morphology has been identified as a critical habitat constituent element for Little Colorado spinedace. Ground disturbing activities such as road reconstruction, thinning, and prescribed burning will likely result in short-term increases in sediment deposition within occupied habitat. Substrate embeddedness is currently high in the affected reaches of Rudd and Nutrioso and increased sediment deposition will further reduce aquatic macroinvertebrate production, thereby limiting the food base for spinedace. The addition of fine sediments may smother fertilized eggs and/or hinder their development. Sediments will settle into pools, thereby reducing available pool habitats for spinedace. Sedimentation effects are expected to occur for up to three years following each mechanical treatment and for up to two years after each prescribed burning treatment.

Best Management Practices identified for this project should provide some protection to spinedace habitats from sedimentation or fire generated ash effects. The site specific BMPs identified for the Eagar South WUI project are soil and water conservation practices that have been developed as part of the proposed action to reduce sediment and nutrient transport to instream habitats, thereby reducing adverse effects to spinedace. Nonetheless, since baseline aquatic habitat conditions and apparent population numbers in Rudd and Nutrioso creeks are not satisfactory, the species is especially vulnerable to changes in habitat structure or water quality.

To summarize, adverse effects include short-term increases in stream turbidity levels and increased sediment deposition within occupied habitat. In the long-term, this project may be beneficial to spinedace and its critical habitat with the reduction in fire hazard, resulting in decreased risk to the species from catastrophic fire effects in the watershed.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

With the exception of continued water withdrawals associated with water rights and the continued stocking and management of rainbow trout in Nelson Reservoir, there are no State, tribal, or private actions known to be planned within the action area. Water withdrawals will continue to impact water quantity which is already strained by drought conditions. Rainbow trout below Nelson will continue to prey on spinedace.

CONCLUSION

After reviewing the current status of Little Colorado spinedace and its critical habitat, the environmental baseline for the action area, the effects of the proposed Eagar South WUI and the cumulative effects, it is the FWS's biological opinion that the Eagar South WUI, as proposed, is not likely to jeopardize the continued existence of the Little Colorado spinedace, and is not likely to destroy or adversely modify designated critical habitat for Little Colorado spinedace.

This biological opinion does not rely on the regulatory definition of “destruction or adverse modification” of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

We present this conclusion on Little Colorado spinedace for the following reasons:

- The Forest Service has included Best Management Practices in the proposed action to minimize the amount of ash and sediment within Rudd Creek, Nutrioso Creek, and the Little Colorado River and their tributaries within the Eagar South WUI boundary.
- Impacts from sediment and ash flow will be short-term and contribute to a reduction in the likelihood of catastrophic wildfires.
- Within the Rudd/Nutrioso Creek 6th code watershed thinning and harvest activities will be limited to 2,000 acres within any year. This 2,000 acres will include all Forest Service lands within the watershed and will minimize disturbances to Little Colorado spinedace due to numerous projects in the area (Eagar South and Nutrioso WUI).
- Critical habitat will retain the value of the PCEs.

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “n incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. 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 to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Forest Service so that they become binding conditions of any grant or permit issued to any applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest Service (1) fails to assume and implement the terms and conditions or (2) fails to require any applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest Service or applicant must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

We anticipate that the proposed actions covered by this Biological Opinion are reasonably certain to result in incidental take of Little Colorado spinedace. Some level of incidental take is expected to occur within the action area as a result of thinning and burning activities due to subsequent changes in water quality and habitat structure from short-term increases in sediment delivery via channelized flows into occupied Little Colorado spinedace habitat. Because of the inherent biological characteristics of aquatic species such as Little Colorado spinedace, the likelihood of discovering take attributable to these actions is very small. The anticipated level of incidental take cannot be directly quantified because of the unknown numbers of Little Colorado spinedace in the project area and the difficulty detecting Little Colorado spinedace due to eggs, fry, and fish being small, blending into their environment, and occurring underwater in a flowing river. Therefore, we define incidental take in terms of habitat conditions, and use surrogate measures to identify when take has been exceeded. We anticipate that take will occur throughout those portions of Rudd and Nutrioso creeks and their tributaries included within the proposed action area. The authorized level of incidental take of Little Colorado spinedace from the proposed action will be exceeded if any of the following conditions occur:

1. There are declines in stream functioning conditions within the Nutrioso Creek watershed as measured by Proper Functioning Condition (PFC) surveys, which are attributable to the proposed action.

2. The anticipated effects to Little Colorado spinedace are greater than those disclosed in the project Biological Assessment and Evaluation (BAE) as anticipated from planned implementation of Best Management Practices (BMPs) or the effectiveness of the implemented BMPs.
3. There is a decline in Little Colorado spinedace constituent elements due to the proposed action. GAWS survey data will be used as baseline data for the constituent element measures. Future surveys will be accomplished by Region 3 Stream Inventory Protocol.

Stream functioning conditions and evaluations of BMPs are acceptable surrogate measures for determining incidental take because: 1) they can be measured; 2) they are defined in the baseline for the project area; and 3) they relate to on the ground effects to Little Colorado spinedace and its habitat, as described in the effects section.

EFFECT OF THE TAKE

In this biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The measures described below are non-discretionary, and must be undertaken by the Forest Service so that they become binding conditions of any grant or permit issued to the permittee, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest Service (1) fails to assume and implement the terms and conditions or (2) fails to require the permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest Service must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described below and the reporting/monitoring requirements. These terms and conditions are non-discretionary.

Little Colorado Spinedace

The following reasonable and prudent measure(s) and terms and conditions are necessary and appropriate to minimize take of Little Colorado spinedace:

1. Protect riverine and riparian habitat within Rudd Creek, Nutrioso Creek, and the Little Colorado River, and their tributaries from significant effects using BMPs, appropriate mitigation measures, or site specific riparian and stream management guidelines.
 - a. The Forest Service shall not begin project disturbing actions until implementation and effectiveness monitoring forms are developed and approved to monitor BMPs. The Forest Service shall develop monitoring

forms for in-channel and streamside management zone observations that are indicators of excessive sediment delivery to streams due to the proposed action.

- b. Manage riparian areas and streamside management zones adjacent to and upstream of spinedace populations as natural or man-made buffers to minimize indirect effects to spinedace. The Forest Service shall adjust applications of BMPs and/or treatment parameters (such as intensity of prescribed burns, width of buffer zones, timing of future entries, etc.), as necessary, to assure that sediment and ash delivery to streams within spinedace habitat is minimized.
 - c. The Forest Service shall identify treatment areas during and after initial entries of project implementation where BMPs, as implemented, may have been insufficient to prevent ash or sediment from entering streams of concern.
2. The Forest Service shall monitor the project area and other areas that could be affected by the proposed action to ascertain take of individuals of the species and/or loss of its habitat. This monitoring will be accomplished using the following protocol:
- a. The Forest shall perform field verifications to ensure that there are adequate buffers for sediment and ash flow.
 - b. The Forest shall monitor both the implementation and effectiveness of Best Management Practices using standard BMP monitoring protocols.
 - c. The Forest shall complete both PFC and Level II Stream Surveys (USFS Region 3 protocol) on Rudd Creek.
 - d. The Forest Service shall submit annual monitoring reports to the Arizona Ecological Services Field Office by January 1st every year. These reports shall briefly document for the previous calendar year the actions completed, BMP implementation and effectiveness monitoring forms, effectiveness of the terms and conditions and locations of listed species observed, and, if any Little Colorado spinedace are found dead, suspected cause of mortality. The report shall also summarize tasks accomplished under the proposed minimization measures and terms and conditions. The report shall make recommendations for modifying or refining these terms and conditions to enhance listed species protection or reduce needless hardship on the Forest Service and its permittees.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Forest Service must immediately provide an explanation of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures.

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 480/967-7900 within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that you continue to identify factors that limit the recovery potential of the Little Colorado spinedace on lands under your jurisdiction and work to correct them.
2. We recommend that you acquire instream flow water rights to ensure perennial flow in streams with Little Colorado spinedace habitat.

In order for the FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect 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 the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

The FWS appreciates the Forest Service's efforts to identify and minimize effects to listed species from this project. For further information please contact Jennifer Graves (x232) or Debra Bills (x239).

Please refer to the consultation number, 02-21-05-F-0640, in future correspondence concerning this project.

Sincerely,

Steven L. Spangle
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ES)
District Ranger, Springerville Ranger District, Springerville, AZ
Fishery Biologist, Springerville Ranger District, Springerville, AZ (Attn: Kathy McMillan)
Shaula Hedwall, Fish and Wildlife Service, Flagstaff, AZ

Bob Broscheid, Habitat Branch Chief, Arizona Game and Fish Department, Phoenix, AZ

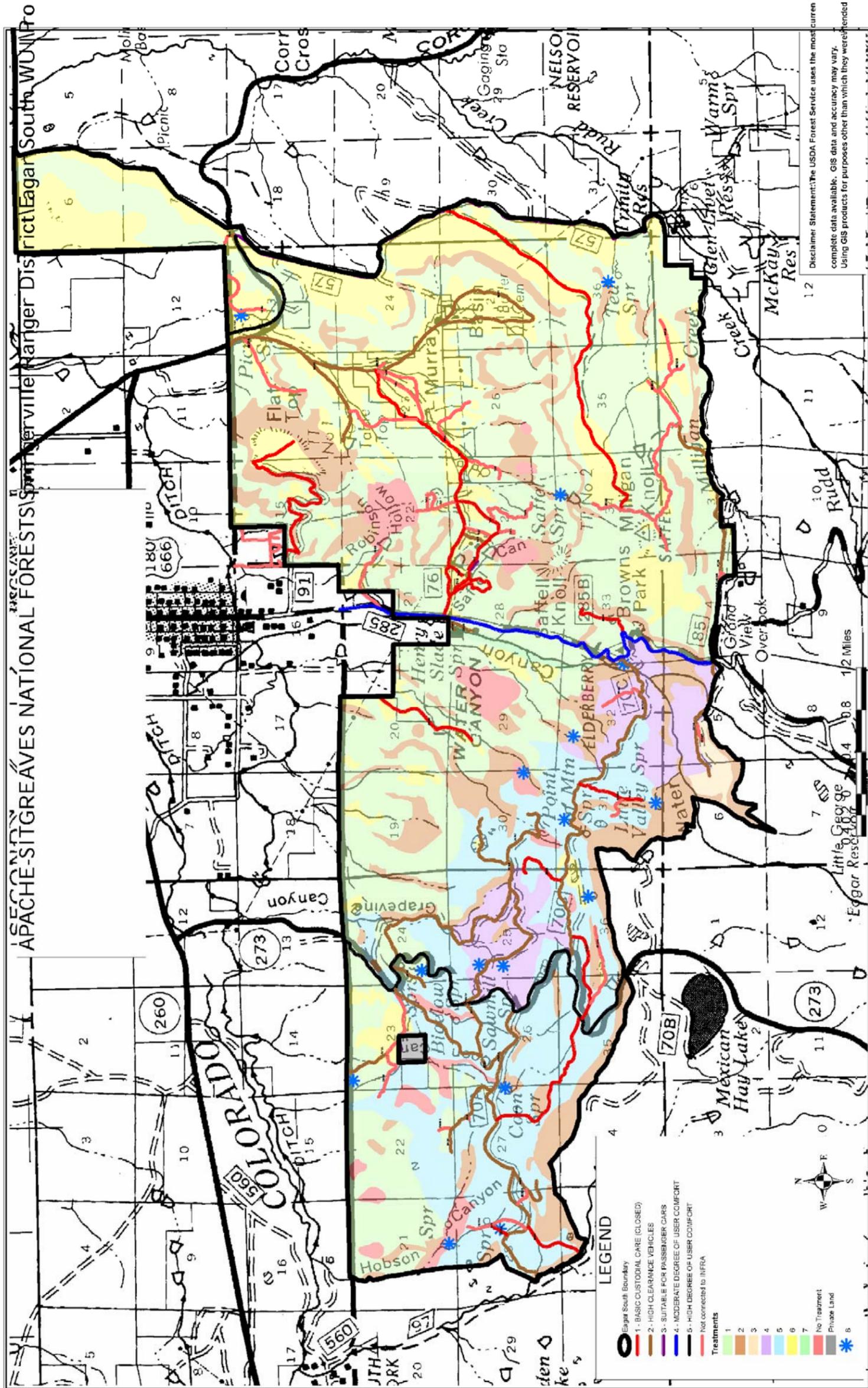
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APPENDIX A: MAP OF PROJECT WITH TREATMENTS

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Disclaimer Statement: The USDA Forest Service uses the most current complete data available. GIS data and accuracy may vary. Using GIS products for purposes other than which they were intended.

APPENDIX B: TABLES

Table 1: Formal consultations for actions affecting Little Colorado spinedace.

Consultation #	Date	Name	Anticipated Incidental Take
02-21-88-F-0029	May 22, 1989	US Route 180/Arizona 666	Yes, death to approximately 8% of the population and loss of 500 linear feet of habitat
02-21-88-F-0029 R1	April 30, 1991	Reinitiation of US Route 180/Arizona 666	Yes, death to approximately 8% of the population and loss of 275 linear feet of habitat
02-21-92-F-0403	August 2, 1995	Federal Aid's Transfer of Funds to the Arizona Game and Fish Department for Exotic Fish Stocking in Nelson Reservoir, Blue Ridge Reservoir, and Knoll Lake	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-92-F-0403	November 20, 1995	Federal Aid's Transfer of Funds to the Arizona Game and Fish Department for Exotic Fish Stocking in Nelson Reservoir, Blue Ridge Reservoir, and Knoll Lake	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-96-F-339	July 31, 1996	Greer River Reservoir Dam	None anticipated
02-21-01-F-0425	May 6, 1997	Buck Springs Range Allotment Management Plan	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-88-F-167	March 30, 1998	Phoenix Resource Management Plan for the Bureau of Land Management	None anticipated
02-21-97-F-343	March 31, 1998	Bank Stabilization on the Little Colorado River South of St. Johns, Arizona	Yes, take of 5 adults or juveniles Little Colorado spinedace anticipated
000089RO	February 2, 1999	Regional ongoing grazing activities on allotments (Buck Springs, Colter Creek, Limestone, South Escudilla)	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-96-F-422 and 423	April 16, 1999	Amendment No 1 Phoenix District Az Grazing EIS Upper Gila San Simon	None anticipated
02-21-99-F-0167	July 1, 1999	McCain and Sears Whip Bank Stabilization on the Little Colorado River	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided

02-21-92-F-0403	May 25, 2001	Federal Aid's Transfer of Funds to the Arizona Game and Fish Department for Exotic Fish Stocking in Nelson Reservoir, Blue Ridge Reservoir, and Knoll Lake	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-01-F-218	August 21, 2001	Upper Little Colorado River Riparian Enhancement Demonstration Project	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-02-0220	October 4, 2002	Crayfish Study in Nutrioso Creek *	Yes, take of 10 Little Colorado spinedace anticipated
02-21-01-101	April 19, 2002	Apache trout reintroduction	None anticipated
02-21-01-F-0425	April 30, 2003	Buck Springs Allotment Management Plan	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-03-0369	October 16, 2003	Replacement of Little Colorado River Bridge #1184 State Route 87	Yes, take anticipated; however, take is not quantifiable so surrogate measures are provided
02-21-03-F-0210	September 3, 2004	BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management	None anticipated
02-22-03-F-0366	June 10, 2005	Region 3 Forest Service Continued Implementation of the Land and Resource Management Plans for the 11 Southwestern Forests and Grasslands	Yes, take anticipated; not possible to quantify. FWS concludes that IT of LCS will be exceeded if there is a loss of one population in the current number of spinedace populations on NFS lands without being off-set by newly established populations.

* The project "Crayfish Study in Nutrioso Creek" never occurred.

Table 2: Timber Treatments on the Apache-Sitgreaves National Forests completed or under analysis in the Upper Little Colorado Watershed.

Timber Treatment Proportional Extent						
Upper Little Colorado River						
Timber Sale Name	Year Completed	Treatment*	Volume MMBF Or *CCF	Project Area Acres	Upper Little Colorado WS Acres	% of WS
Auger	1984	Saw	24.2	12,204	6,147	1.9
Badger Knoll/OD/Hay	2001	NCT	+	154	154	0.05
Beehive	Open	Multi	#	7,502	4,971	1.5
Benny-Hide	2003	NCT	+	71	71	0.02
Burro	2001	Multi	+	649	649	0.2
Burro/Spruce Spring	1987	Saw	25	8,377	1,780	0.6
Canyon	1977	Saw	10.5	9,333	9,333	2.9
Circe	1977	Multi	N/A	13,785	2,588	
Dry Valley	1987	Saw	12.5	12,128	12,128	3.8
Fish Creek	2003	NCT	+	400	400	0.1
Greer	1999	+	724*	398	398	0.1
Greer WUI	#	NCT	#	19,121	19,121	6.2
Hay	1999	Multi	12.0	9,202	8,794	1.3
Iris Springs Meadow Restoration	1998	NCT	+	100	100	0.03
Iris Springs	1984	Saw	26	15,444	11,358	3.5
Loco Pasture	2001	NCT	+	170	170	0.05
Long Point/Greer Lookout	2001	NCT	+	111	111	0.04
Marble	1989	Saw	4.4	2,810	2,810	0.9
Mexican Hay	1987	Saw	15.0	6,992	6,992	2.2
Montlure	2002	NCT	+	170	170	0.05
North Unit	1995	Saw	3.9	6,118	6,118	1.9
Nutrioso WUI	#	NCT	#	30,032	27,439	8.9
OD Ridge	2001	Multi	5.8	6,609	3,206	1.0
Riley/Hay Lake	1998	NCT	+	337	337	0.1
Phoneline	1999	NCT	758*	320	320	0.1
Pole Knoll	1976	Saw	+	6,311	6,311	2.0
Potato Patch	+	+	+	10,004	330	0.1
Riggs	+	+	+	5,180	3,603	1.1
Seed Cut 1/South Fork Tank	2000	NCT	+	93	93	
South Fork	1987	Saw	13.6	15,946	15,946	5.0
Watts	1990	Saw	14.4	10,806	7,301	2.3
West Fork/Marble	1987	+	+	1,436	1,436	0.5

N/A indicates sale has not been completed or not planned in 5 year plan

Future TS volume in CCFs

Analysis is not in progress

+ No Records Available

* NCT: Non-commercial thinning; Saw: Saw timber; Multi: Multi-product