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In Reply Refer To:

May 22, 2007

AESO/SE
22410-1995-F-0290

Ms. Elaine J. Zieroth
Forest Supervisor
Apache-Sitgreaves National Forest
PO Box 640
Springerville, Arizona 85938

Dear Ms. Zieroth:

Thank you for your memorandum requesting 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 for formal consultation was dated November 20, 2006, and received by us on December 2, 2006. At issue are impacts that may result from the grazing permit renewal and implementation of allotment management and vegetation treatment plans for the Carlisle Complex Allotment, Navajo County, Arizona. The proposed action may affect the threatened Little Colorado spinedace (*Lepidomeda vittata*).

In your memorandum, you requested our concurrence that the proposed action is not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*), Mexican spotted owl (*Strix occidentalis lucida*) and its critical habitat, and the Chiricahua leopard frog (*Rana chiricahuensis*). We concur with these findings. The basis for our concurrence is found in Appendix A.

This biological opinion is based on information provided in the November 20, 2006, biological assessment, numerous telephone conversations, field investigations, and other sources of information. References cited in this biological opinion are not a complete bibliography of all references available on the species of concern, the proposed activities 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

- March 1, 1995 - the Forest Service requested a species list on the Carlisle Term Permit Renewal Area.
- May 5, 1995 - we sent a species list to the Forest Service.

- November 20, 2006 - the Forest Service requested formal consultation on the Carlisle Allotment.
- November 22, 2006 - we visited the site, primarily the Cottonwood Wash watershed and the Silver Creek reaches within Taylor and Snowflake, AZ
- March 8, 2007 - we sent a draft Biological Opinion to the Forest Service.
- April 16, 2007 – 135-day consultation period ends.
- April 20, 2007 - the Forest Service sent us comments on the draft biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

This consultation covers the effects of the proposed livestock grazing permit renewal and implementation of the allotment management plan (AMP) and vegetation treatment plan, for the Carlisle Complex Allotment on the Lakeside Ranger District (District), Sitgreaves National Forest (Map 1). The AMP will cover 10 years, initiating upon completion of the AMP and this consultation.

Permit Renewal and Allotment Management Plan

The Carlisle Complex (occasionally referred to as the Railroad Allotment) originally consisted of the Dodson, Pinedale, Linden, Capps, McNeil, and Juniper Ridge allotments, which have since been permitted to a single operator (Map 1, Appendix B). The allotment, comprised of 25 pastures, is located in the western portion of the District near the towns of Pinedale, Linden and Show Low. For purposes of this consultation, when referring to a large group of pastures within one of the original allotments, that original allotment will be referred to as a sub-allotment of the Carlisle (i.e., the Dodson sub-allotment). Map 1 is color-coded to illustrate the sub-allotments. The Carlisle Complex allotment encompasses 88,630 acres of National Forest Services lands within the District.

The District proposes to issue a term grazing permit to balance permitted livestock numbers with capacity, during varying seasons, on lands that are capable of supporting livestock grazing on the allotment. Data were collected to determine the balance of permitted livestock and range capacity during the last Range Analysis (1999-2000). Approximately 66 percent of the allotment was determined to be full capacity (producing at least 100 pounds of herbaceous forage/acre) in the 1999/2000 range analysis. Approximately 34 percent of the allotment acres were considered potential capacity (producing < 100 pounds/acre). In 2007, a new Geographic Information Systems analysis showed that full capacity condition had been returned to large portions of the Rodeo-Chediski (RC) fire area. Currently, 16 percent of the total burn area is rated Potentially Capable.

The major components of the AMP are as follows:

- A new Term Grazing Permit will be issued, authorizing 1,068 - 2,160 Head Months under a one-herd deferred-rest rotation grazing system for the entire allotment. The class of livestock will be cow/calf and the herd size will range from 89 to 180.
- Each pasture will be given complete rest (no grazing through the following growing season) for a minimum of one year in three. Of the 18 pastures partially or completely burned during the 2002, RC fires, all have been added back to the grazing schedule. Four pastures will be managed to provide extra rest, up to every other year. The Walker Lake, Cactus Flat, Rattlesnake, and Bull Hollow pastures will be given additional rest when other pastures are added back into rotation.
- Permitted livestock numbers could be adjusted each year based on monitoring results.
- A maximum of 25% utilization on current annual growth of key forage species (grasses) in key areas would be allowed. Cattle will be moved to the next scheduled pasture when this threshold is met. Forage use would be measured by point in time measurement with no re-grazing of pastures within the calendar year.
- There are no use-standards for browse species. Annual growth production of browse species will not be used to estimate livestock capacity in any pasture.
- Livestock grazing will be allowed in all accessible portions of all streams/drainages and their associated riparian zones, including Cottonwood Wash, Dodson Wash, Show Low Creek, and others. The rotation schedule has the flexibility to permit fall-winter grazing in the northern pastures. Generally southern pastures would receive more growing season use.

Additional actions included in the AMP are as follows:

- Where feasible and practical, smaller pastures may be consolidated and larger pastures possibly split into others so they contain approximately the same amount of forage. This will allow for a more efficient rotation schedule. Due to potential costs, consolidation is more likely than splitting pastures and most of these actions would be confined to the burned area.
- Fences and other developments will be in serviceable condition prior to livestock being allowed to graze the affected pasture.
- A total of approximately four miles of new fences, seven miles of burned fence line removal, and nine miles of fence reconstruction are proposed. At least ten cattle-guards

will be constructed to prevent unscheduled livestock movement between pastures through gates left open.

- A monitoring plan has been developed for the proposed action to help ensure standards are met and the allotment is moving toward desired conditions. The monitoring plan will identify key areas, methods, and timing of monitoring. All monitoring will be completed by Lakeside District staff and/or the permittee.

Vegetation Treatment Plan

The proposed vegetation treatment plan is designed to meet Desired Future Conditions by converting stand Vegetative Structural Stage classification and by maintaining existing openings. The plan includes the following actions:

- Treat approximately 600-1,000 acres of woodland stands per year over the next decade. Stands will be selected based on the following priorities:
 - those affected by the RC Fire,
 - those with natural or created openings requiring maintenance,
 - those defined as Wildland-Urban Interface stands, and
 - of the remainder, those which will move the Complex toward Vegetative Structural Stage objectives.
- Treatments may include personal-use or commercial fuelwood sales, mechanized equipment, and prescribed burning.
- Treatments will be scheduled in coordination with the grazing schedule. Any vegetation treatments will be followed by at least two consecutive growing seasons of rest prior to livestock being allowed to graze the affected pasture.

Action Area Description

The action area includes the Carlisle Complex allotment, the Cottonwood-Dodson Wash watershed, and Silver Creek below its confluence with Cottonwood Wash. The allotment consists of several relatively steep, north-south ridges separated by fairly wide drainages. To the north, the land becomes less steep with more rolling hills, and some steep-walled canyons. Elevations on the allotment range from 6,000 to 7,000 feet. The allotment is within two 5th-code watersheds, the Cottonwood-Dodson and the Show Creek watershed. About half of the annual precipitation occurs during the growing season (June – October).

The majority of wooded overstory north of Highway 260 is dense, closed canopy pinyon-juniper woodlands. The midstory component, where present, is composed primarily of younger representatives of the overstory canopy, and sometimes clumps or isolated patches of browse

species, including mountain mahogany (*Cercocarpus montanus*), Gambel oak (*Quercus gambelii*), shrub live oak (*Q. turbinella*), Fremont barberry (*Berberis fremontii*), cliffrose (*Cowania mexicana*), and manzanita (*Arctostaphylos patula*). Currently, most of the more palatable browse species are heavily hedged, display low vigor, and occur sporadically at low densities.

The herbaceous understory component is dominated by blue grama (*Bouteloua gracilis*). Blue grama is a warm season grass species, with most of its growth occurring after the onset of summer rains. Other warm season grasses include side oats grama (*B. curtipendula*), wolf tail, three-awns (*Aristida* sp.) and ring-muhly (*Muhlenbergia gracillima*). Secondary grasses, which are uncommon throughout most of the analysis area, include cool season species such as pine dropseed (*Blepharoneuron tricholepis*), various *Muhlenbergia* sp., and squirreltail (*Sitanion hystrix*). Livestock use these latter species early in the grazing period before blue grama is available. A variety of annual and perennial forbs occupy the understory. Additionally, non-native invasive species such as Russian thistle (*Salsola iberica*) seem to be gaining a foothold in some areas. Species such as cholla cactus (*Cylindropuntia* sp.) and prickly pear cactus (*Opuntia* sp.) which often indicate declining range conditions in grassland and woodland habitats, also appear to be increasing in numbers in more historically heavily-used areas.

STATUS OF THE SPECIES

Little Colorado Spinedace

The Little Colorado spinedace was listed as threatened with critical habitat 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. The primary 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 minnow (about four inches long) 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 during the period of 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).

As with most aquatic habitats in the southwest, the LCR 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 re-colonize 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.

Rangewide Population Status

The spinedace is still found in the streams it is known from historically (Chevelon, Silver, Nutrioso, East Clear Creek, and the LCR proper), but 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. Spinedace were not found again in Silver Creek during 2003 and 2004 surveys.

There is currently one refugial population of East Clear Creek spinedace (located at the Flagstaff Arboretum), totaling about 340 individuals. All of the known populations have decreased since 1993 and drought conditions continue to put additional strain on all known populations.

Our information indicates 24 formal consultations have been completed or are underway for actions affecting spinedace rangewide (Appendix C, Table 1). Adverse effects to 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 spinedace. However, as is the case with many aquatic species, it is difficult, if not impossible, to quantify the actual incidental take of spinedace to date. The continued invasion of non-native aquatic species into spinedace habitat and the on-going reductions in surface water (due to both drought and groundwater pumping) are two of the greatest threats to the species and are contributing factors to the spinedace's overall decline.

ENVIRONMENTAL BASELINE

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.

Status of the Species within the Action Area

Spinedace do not occupy any stream on the Carlisle Complex Allotment. However, land management activities that occur within the allotment may affect stream morphology and aquatic habitats downstream of the allotment. Cottonwood Wash, which flows through the Carlisle Complex Allotment, is a major tributary that flows into Silver Creek immediately upstream of spinedace habitat. Cottonwood Wash is a large ephemeral drainage that has an approximate 240 square mile watershed. Other large tributaries, within this watershed include: Mortenson Wash, Dodson Wash, and Town Draw.

Spinedace were last detected in Silver Creek, downstream of the allotment in 1997. Occupied spinedace habitat in Silver Creek occurred from its confluence with Cottonwood Wash (at Snowflake) to its confluence with the LCR (approximately 12 miles). There is a record of spinedace occurrence in Cottonwood Wash in 1974 in the Arizona Game and Fish Department (AGFD) Heritage Database Management System. Silver Creek, downstream from the Cottonwood Wash confluence, is located on private lands within a canyon. Streambanks are well-vegetated with willow (*Salix ssp.*). Access is difficult due to posted private lands in the area. In recent years spinedace have not been located during fish surveys; however, it has been difficult to obtain accurate survey data within Silver Creek because of murky water and the deep pools created by beaver dams which render electro-shockers ineffective. Also, the presumed low numbers of the species make it even more difficult to detect (B. Csargo, Apache-Sitgreaves NF, pers. comm. January 8, 2007).

There is no spinedace critical habitat designated within the action area. In the 2005 Land and Resource Management Plan consultation, the Forest Service committed to designing projects in occupied spinedace habitat on National Forest System lands which address components of the spinedace recovery plan, with the goal of implementing projects with beneficial, insignificant, or discountable effects to the spinedace.

Several activities have already occurred or are occurring now within the proposed action area. Federal activities have included livestock grazing and wildfire suppression. Existing conditions have been influenced by wildfire, wildfire suppression, and livestock grazing. In addition, some actions on private lands have also affected existing conditions within the action area.

Information on each of these activities is as follows:

Livestock Management

Current permitted numbers are 5,536 Head Months for either yearlong or seasonal grazing, depending on the sub-allotment or pasture. Actual use has varied substantially over the past decade, averaging about 4,024 Head Months for the period (Carlisle Complex Allotment grazing files). Prior to 1999, the average herd size was about 425 head, cow/calf, for all combined pastures. Due to permittee's preference, numbers were reduced in 1999 and 2001. Herd size was about 200 head between 2001 and 2002. Between 2002 and 2005, herd size was again reduced to 120 head following the RC Fire. Herd size was increased to 150 in the late summer of 2006.

Until five years ago, the livestock use threshold on key forage plants was 45% of the current annual growth. The use threshold was decreased to 35% over the past five years (B. Csargo, Apache-Sitgreaves NF, pers. comm. February 12, 2007).

Fourteen of 25 pastures were either partially or completely burned over in the RC Fire of 2002. Pastures where most of the acres were burned over include East Cottonwood, Burn, Deer Lick, Lons, Bear Canyon, Pinedale, and South Juniper Ridge. These pastures are all south of State Route 260. Carlisle Complex Allotment pastures, north of State Route 260, that were partially burned in the RC fire include Bull, East Bull, Capps, Owens, Mortenson, Wilson and Cactus Flat.

The RC Fire affected almost all pastures in the southern portion of the allotment (south of State Route 260). Most pastures affected by the RC Fire were not grazed between 2002 and 2005. Exceptions include the Wilson and Cactus Flat pastures, grazed in 2003, and the Owens pasture which was grazed in 2004. Beginning in 2005 the Bull, East Bull, Mortensen, Capps, and East Cottonwood pastures were added to the grazing rotation. By 2006, all pastures were considered recovered; and Lons (including the former Burn pasture), Bear Canyon, Pinedale, Deer Lick, Fence Tank, and South Juniper Ridge Pastures were grazed in 2006.

The remaining pastures burned in the fire received complete rest from domestic livestock grazing until fair or better range condition was achieved. This rest was designed to provide resource protection while the area achieves vegetative recovery and soil stability after the short- and long-term restoration actions were completed. The pastures that were grazed in 2004, 2005, and 2006 achieved fair condition based on field monitoring procedures. Resumption of livestock grazing is decided by the line officer and the range conservationist.

Dodson, Pinedale and Linden sub-allotments are currently permitted for year-round use; livestock can be rotated into pastures at any time of the year. The Capps pasture was grazed November to February until 2001, when the season-of-use was changed to June to October. West and East McNeil, South, Bull, and East Bull are summer pastures. Historically, pastures of the northern allotments have been grazed under various management schemes, ranging from deferred-rest rotation to single pasture management for the winter or summer growing season. All pastures south of State Route 260 are considered to be summer range, located at higher elevations in ponderosa pine communities. This includes the Fence Tank, McNeil West and McNeil East pastures, as well as most of those in the Pinedale sub-allotment.

According to the BAE, current herbaceous production on the Carlisle Complex Allotment is below potential herbaceous production. Poor to very poor range condition (often with declining trends) occur in many areas of the allotment, particularly the pinyon-juniper and grassland vegetation types (USFS 1999). Information provided by the District notes:

1. There may be evidence that sedimentation generated by soil loss on the Carlisle Complex is causing impacts to Silver Creek habitat based on the 2005 Carlisle Watershed Specialist Report (Lakeside Ranger District files). However, an analysis has not been completed to quantify the pounds of topsoil or the magnitude of erosion from the uplands downstream into Silver Creek.
2. The Carlisle Complex land base is a significant portion (40%) of the Cottonwood-Dodson 5th code watershed, which drains into Silver Creek. Authorized land management activities on Carlisle Complex may affect 40% of the watershed. This includes all upland activities that contribute to downstream effects. The percent of

sediments generated by land management activities on the Carlisle Complex may be higher or lower than 40%.

3. Much of the 88,000 acres of the Carlisle Complex contains degraded rangelands. Unsatisfactory/impaired watershed conditions exist throughout the pinyon-juniper vegetation type. These conditions have more or less existed for the last eight decades (USFS 2006b).
4. There continues to be massive sheet erosion even on relatively flat ground and pedestaled perennial grass plants (mostly blue grama) with shallow root systems are common in many areas. There are large areas of bare ground, and inadequate ground cover in many areas to prevent accelerated erosion.

Fire History

There have been wildfires within the action area. Three fires, Cottonwood (1,484 acres), Grade (20 acres), and Dodson (36 acres) burned within the Pinedale sub-allotment between 1973 and 1996. Three other fires, Bagnal (40 acres), Fence in 1992 (15 acres), and Fence in 1999 (17 acres) burned within the Linden sub-allotment.

The Rodeo-Chediski wildfire, which ignited on June 18, 2002, burned for 19 days. It consumed 462,384 acres of ponderosa pine forest; 164,644 acres of which were on the ASNF. Approximately 40,500 acres burned on the Lakeside Range District, including much of the Carlisle Complex Allotment.

Pinyon-Juniper Woodlands

Portions of pastures north of State Road 260 are dominated by dense stands of pinyon and juniper which account for approximately 48% of the total vegetative cover (42,500 acres) (USFS 2006b). Many of these stands are the result of invasive growth of these trees on to rangeland sites that were previously dominated by grassland. Past overgrazing and fire suppression in grasslands is often cited as the cause for this vegetative type conversion (Baker and Shinneman 2000). According to the BAE, many of these stands exhibit a dense canopy closure (often 60-90+%) which limits herbaceous growth in the understory. Very little change in understory species composition occurs in these mature tree stands (Austin 1987). Pinyon and juniper trees have shallow, widespread rooting systems that make them very effective soil moisture competitors. Being evergreen, they are absorbing moisture through the winter and early spring prior to cool-season grass growth periods. The understory areas also lack sufficient ground cover to prevent accelerated erosion, which has resulted in the observed unsatisfactory watershed conditions on the Carlisle Complex Allotment. Herbaceous forage production in these areas are also far below their potential. Preliminary figures indicate that the allotment complex, primarily the pastures unburned by the RC fire, is producing 10% or less of its potential herbaceous production.

Private Land

There are numerous sand and gravel operations in and immediately adjacent to Cottonwood Wash within the action area. These are all located on private lands near the towns of Taylor and

Snowflake, downstream from the Carlisle Complex Allotment boundary. These operations very likely contribute large amounts of sediment into Cottonwood Wash which is likely carried into Silver Creek when large flood flows occur. These same excavations may limit sediment from being carried into Silver Creek by slowing down flood flows and causing the excavated sediment to settle in the pits. There is one operation located in Cottonwood Wash within 0.25 mile of Silver Creek which is believed to be occupied by spinedace. Sand and gravel excavation in this area has formed a large lake that stretches from the operation to the Silver Creek confluence. It is likely that there are other large bodies of water associated with the other sand and gravel operations upstream. These large ponds may provide habitat for non-native fish.

Silver Creek flows through private lands in the Taylor-Snowflake area. It flows through large pastures which are grazed by cattle. These cattle have unlimited access to the creek where streambank collapse and erosion is commonly observed. The Silver Creek reaches that flow through residential areas have numerous mid-channel bars which are likely a result of the streambank failure observed in the pastures and residential areas.

EFFECTS OF THE PROPOSED 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, which 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.

Permit Renewal and Allotment Management Plan

According to the BAE, it is assumed that sedimentation from the current range conditions on the Carlisle Complex Allotment may be causing significant impacts to the habitat in Silver Creek. Improper livestock grazing in upland watersheds can affect streams and creeks in various ways. Decreased vegetative cover and soil compaction from livestock grazing can reduce precipitation infiltration rates during storm events (Rauzi and Smith 1973, Russell et al. 2001). Vegetation provides hydrologic roughness that slows overland flow and allows runoff to infiltrate into the soil. When vegetation is removed, for example from improper grazing, wildfire, increased road density, etc., runoff is increased (Lusby 1970, Trimble and Mendel 1995). The effects of increased upland runoff to downstream resources are twofold; increased frequency and magnitude of flood events and increased sediment delivery. Stream channels stabilize through time as they adjust to the flow and sediment delivered from the watershed. When either of these components changes the stream channel becomes unstable and stream channel and bank alteration may occur.

Given the impacts to the watershed from the RC fire and other impacts, continued livestock grazing can increase flood flows into Silver Creek and result in excessive streambank erosion if the flows exceed what the current vegetation can stabilize. The most likely occupied spinedace habitat on Silver Creek is located on private land that may not have adequate vegetation to provide streambank stability during flood flows. If runoff is increased from the Cottonwood Wash watershed as a result of livestock grazing, it may adversely affect spinedace habitat. There

are numerous ponds within Cottonwood Wash, in association with sand and gravel operations (see Cumulative Effects section below). These ponds may act to dissipate some flood flow energy, but extreme flood events in response to poor watershed condition may still affect Silver Creek when floods overflow the ponds.

Increased erosion and siltation in streams due to livestock grazing in adjacent uplands will also cause habitat degradation as pool habitats fill and fine sediments accumulated in gravel and cobble habitats. Excessive sediment deposited in water bodies is also a water quality issue. It is recognized as a major pollutant of United States water (EPA 1994, Waters 1995).

Currently, there is a lack of data to quantify the level of sedimentation effects because an analysis has not been completed to verify the amount of topsoil lost on a yearly basis on the Carlisle Complex. However, a review of results of a District Range Analysis Report from 2000 and District observations throughout the northern pastures, shows significant sheet erosion and pedastaling of plants over large areas of the allotment. The results based upon this review indicate that there are substantial amounts of soil loss occurring and this is expected to continue under the proposed action.

Residual negative effects are expected to continue for many years primarily due to continuing soil losses, the severe reduction of the A-horizon soil layer, and the lack of an adequate litter layer and perennial grass cover to preclude erosive forces in much of the pinyon-juniper and grassland or former-grassland areas. The District anticipates that without an adequate A-horizon, it is difficult for a widespread perennial grass layer to recover.

There are numerous sand and gravel mining operations within or adjacent to Cottonwood Wash upstream of the confluence with Silver Creek (see Cumulative Effects section below). The associated ponds in the wash bottom would normally serve as sediment traps. If excessive sediment continues to be delivered to these ponds they would eventually fill, allowing this excessive sediment to continue downstream into Silver Creek.

The proposed action includes reductions in livestock numbers based on relatively recent capacity estimates as described in the draft Environmental Assessment (this includes calculating the estimated number of pounds of herbaceous forage that are produced per acre). Livestock stocking numbers are based on these new capacity estimates. The proposed action should eventually begin to reverse declining or static trends and begin improving ecological conditions. However, since there will be continued livestock grazing at near livestock capacity estimates in the pinyon-juniper woodland, the significant downstream effects are expected to continue until ecological conditions improve.

Vegetation Treatment Plan

Thinning of juniper stands will eventually improve watershed condition by allowing for increased ground cover that will result in reduced rates of erosion into Silver Creek. Soil surface disturbances may temporarily occur while the treatments (prescribed fire, mechanized equipment, and fuel wood sales) are being implemented. However, as in the case of livestock grazing, it would be difficult to ascertain these effects to Silver Creek due to the sand and gravel mining operations in Cottonwood Wash.

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 following section 7 of the Act.

The most likely occupied spinedace habitat is located in Silver Creek on private and State lands immediately downstream of Snowflake, Arizona. There are numerous sand and gravel mining operations within or adjacent to Cottonwood Wash upstream of the confluence with Silver Creek.

Sand and gravel extraction within washes and creek bottoms impact the system up and downstream of the operation (Kondolf 1994, Mount 1995, Norman et al. 1998). Large instream pits that accompany gravel operations often act as sediment traps. During flood events upstream, flows carrying sediment and bedload enter the large ponds, causing the flow and sediment load to decrease. As the flood flow leaves the gravel pit it often causes downcutting downstream because the stream energy has increased as a result of losing the sediment load (Kondolf 1994, Mount 1995). The downcutting in Silver Creek will continue as a result of the lowering of the water table which will affect riparian vegetation. If the water table lowers beyond the depth threshold for riparian plants, upland species will become established. These upland species lack the root structure that help protect stream banks from erosion and collapse. This streambank collapse can result in increased sedimentation downstream.

Concurrent with incision may be coarsening of bed material and direct loss of gravels used for spawning by spinedace and other native fish. Bed coarsening can increase the median grain size available in former spawning areas above the suitable spawning size threshold.

The large ponds formed as a result of gravel operation seen in Cottonwood Wash create warm water lentic conditions that may improve local habitats for non-native warm water species such as green sunfish, catfish, and bass which prey on native fish species (Kondolf et al. 2001). Green sunfish, fathead minnow, rainbow trout, carp and yellow bullhead, currently found in Silver Creek are all potential predators and competitors of spinedace (Lopez et al. 1999).

Silver Creek upstream of the Cottonwood Wash confluence flows for approximately 13 miles through private lands in the Snowflake and Taylor area. The majority of this reach is located in private pasture lands heavily grazed by livestock. Livestock have complete access to the creek bottom and bank erosion and failure is common. Excessive sediment deposition in Silver Creek is evident in the form of large mid-channel sand and gravel bars seen downstream. These Silver Creek reaches also likely receive chemical runoff from agricultural and urban uses adjacent to the creek.

Increased population growth in the Snowflake-Taylor area is likely to increase the demand for groundwater. This may ultimately affect groundwater recharge, springs, and surface flow, thus affecting spinedace in Silver Creek.

CONCLUSION

After reviewing the current status of spinedace, the environmental baseline for the action area, the effects of the proposed permit renewals and AMPs, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the threatened spinedace. We base these conclusions on the following:

1. We can not conclusively determine the impact of sediment generated on the allotment into the occupied areas for the Little Colorado spinedace due to the presence of the sand and gravel operations between the allotment and occupied portions of Silver Creek
2. The District is implementing a new AMP, while recognizing the current range conditions. The proposed action includes reducing the maximum livestock utilization on key species (grasses) in key areas to 25% of the current annual growth. They will be no re-grazing of pastures within the calendar year. Other actions include:
 - Ensuring that fences and other developments will be in serviceable condition prior to livestock being allowed to graze the affected pasture;
 - Accomplishing a more efficient rotation by consolidating the smaller pastures and possibly splitting the larger pastures so they contain approximately the same amount of forage; and
 - Constructing four miles of new fence, removing seven miles of burned fence line, and re-constructing nine miles of fence to provide better livestock management.
3. The District is preparing a vegetation treatment plan which when implemented should reduce erosion and soil movement from the uplands into drainages leading to Silver Creek.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation 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 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. "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.

I. AMOUNT OR EXTENT OF TAKE

Recent court cases have brought attention to many grazing biological opinions in Arizona. The courts have specified that two standards must be met in biological opinions. The Fish and Wildlife Service, together with the action agency, must determine that: 1) a listed species occurs

or is reasonably certain to occur in the project area during the life of the proposed action; and 2) take will or is reasonably certain to result from the action under consultation.

Surveys for spinedace had been conducted, by AGFD, in Silver Creek downstream of the town of Snowflake, Arizona as recently as 2004 and 2005. Spinedace have not been found at these sites since 1997 and their numbers during the 10-year life of this project are uncertain. The poor watershed conditions found on the Carlisle Complex may be contributing large amounts of sediment into Cottonwood and Dodson washes and ultimately into spinedace habitat in Silver Creek downstream of Snowflake, Arizona. Excessive sedimentation may occur as a result of the proposed action. However, we do not think it is possible to separate out the effects of the proposed action from the other sediment delivery mechanisms present in the action area (e.g. the sand and gravel excavation), and we can not determine with the information available at this time whether or not sediment generated by the proposed action reaches occupied portions of Silver Creek, or whether it settles out in the excavated sand and gravel ponds.

Therefore, we are unable to reasonably conclude that take will occur as a result of the proposed action.

II. EFFECT OF THE TAKE

No incidental take is anticipated as a result of the proposed action.

III. REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

In order to be exempt from prohibitions of section 9 of the Act, the Apache-Sitgreaves NF would have to comply with any terms and conditions, which implement reasonable and prudent measures and outline required reporting and monitoring requirements. Terms and conditions are non-discretionary; however, no terms and conditions are contained in this opinion.

Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the Fish and Wildlife Service's Law Enforcement Office, 2450 W. Broadway Rd. #113, Mesa, Arizona 85202 (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, and any other pertinent information. Care must be taken in handling injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to this office or the nearest AGFD office, educational, or research institutions (e.g., Arizona State University in Tempe) holding appropriate State and Federal permits.

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

- Continue to work with us and AGFD to implement actions that will improve the environmental baseline for the Little Colorado spinedace.
- Continue to identify factors that limit the recovery potential of the spinedace on lands under your jurisdiction and work to correct them.
- Work with the FWS and AGFD to begin an aggressive program to control nonnative aquatic organisms within watersheds containing spinedace, particularly fish and crayfish.
- Pursue participation with existing groups to improve watershed conditions on private, state, and Forest Service lands in the Silver Creek watershed.
- Continue to support spinedace surveys.
- Implement quantitative methods to measure actual sediment movement from upland watersheds in the Carlisle Complex Allotment.

REINITIATION STATEMENT

This concludes the formal consultation on the Apache Sitgreaves National Forest's proposal to renew the 10-year grazing permit, implement the AMPs for the Carlisle Complex Allotment and establish a Vegetation Treatment Plan. As provided in 50 CFR 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (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 adversely 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 way 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 this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation, if it is determined that the impact of such taking will cause an irreversible and adverse impact to the species.

We appreciate the Apache Sitgreaves National Forest's efforts to identify and minimize effects to listed species on the Carlisle Complex Allotment. For further information please contact Dave Smith (928) 226-0614 (x109) or Mary Richardson (602) 242-0210 (x242). We also encourage you to coordinate with the AGFD on this project. Please refer to consultation number 22410-1995-F-0290 in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: District Ranger, Lakeside Ranger District, Apache-Sitgreaves National Forest, Lakeside, AZ
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

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APPENDIX A: CONCURRENCES

Bald Eagle

We concur with the finding of “may affect, not likely to adversely affect,” for the bald eagle from the proposed action because the 2004 grazing guidance criteria are met and for the following reasons:

- There are no known bald eagle breeding areas or know winter roosts located within the Carlisle Complex Allotment. There are no lakes or perennial streams, containing fish that are often associated with bald eagle nest and roost locations within the action area. The closest reservoir is Fool Hollow Lake located on the south boundary of the Show Low Riparian Pasture, near Show Low. Bald eagles have not nested at this reservoir to date.
- Recent winter bald eagle surveys show use east of the action area near Show Low and Pinetop-Lakeside communities.
- The proposed vegetation treatments would occur in pinyon-juniper communities located in the north half of the allotment. Wintering bald eagles generally do not use these communities for roosting or foraging.

Mexican Spotted Owl and its Critical Habitat

We concur with the finding of “may affect, not likely to adversely affect,” for the Mexican spotted owl and critical habitat from the proposed action because the 2004 grazing guidance criteria are met and for the following reasons:

- There is no designated spotted owl critical habitat or protected activity centers (PACS) within or near the action area.
- Systematic surveys, following standardized protocol methods, were conducted in 2003 and 2004 in the ponderosa pine/oak vegetation type in the south half of the action area. No spotted owls were detected, and no PACS have been designated in this area.
- The entire ponderosa pine community on the Carlisle Complex allotment was burned during the 2002 Rodeo-Chediski Fire. With exception of three pastures currently grazed, pastures in the south half of the action area have been rested from livestock grazing since the fire.
- The proposed vegetation treatment projects would be implemented in the pinyon-juniper communities in the north half of the action area. This area does not support suitable habitat for spotted owls.

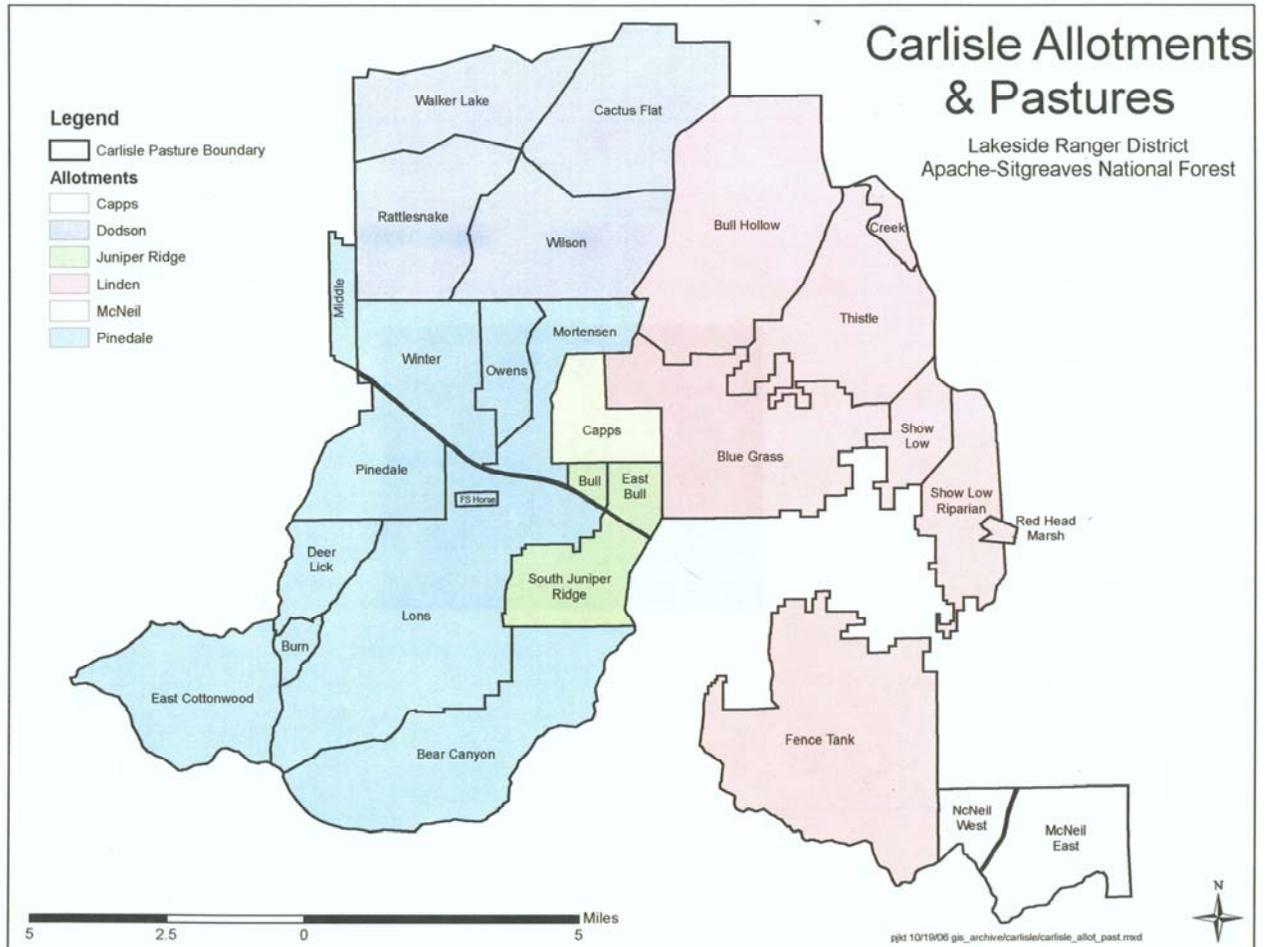
Chiricahua Leopard Frog

We concur with the finding of “may affect, not likely to adversely affect,” for the Chiricahua leopard frog from the proposed action for the following reasons:

- The Lakeside Ranger District has conducted surveys, following the interagency monitoring protocol, and has not documented the presence of this species within the action area.
- Most stocktanks that may provide suitable habitat are not dependable sources of permanent water. Potential habitat in the East Cottonwood Pasture is 50 miles from the nearest known occupied site.

- The proposed action carries forward the conservation measures described in the Final Biological and Conference Opinion of the Continued Implementation of the Land and Resource management Plan for the Eleven National Forests and National Grasslands of the Southwest Region (FWS File Number 02-22-03-F-366).

APPENDIX B: MAPS



Map 1. Carlisle Complex Allotment, Apache-Sitgreaves National Forest, Navajo County, Arizona. Each color represents a different sub-allotment. All pastures within the sub-allotments are identified by name.

APPENDIX C: TABLES

Table 1: Formal consultations for actions affecting the 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	Reinitiaion 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-0167	March 30, 1998	Phoenix Resource Management Plan for the Bureau of Land Management	None anticipated
02-21-97-F-0343	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-0422 and 0423	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-0218	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-F-0220	October 4, 2002	Crayfish Study in Nutrioso Creek *	Yes, take of 10 Little Colorado spinedace anticipated
02-21-01-F-0101	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-F-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.
22410-2006-F-0222	May 8, 2006 (draft)	Wilkin's Family Little Colorado River Riparian Enhancement Project	Yes, take anticipated; not able to quantify. FWS concludes that IT of LCS will be exceeded if channel width at bankfull stage increases in more than 20% of the project area and/or if channel bed elevations in riffle sections do not remain at current elevations as determined by monitoring data.

02-21-05-F-0640	May 12, 2006	Eager South Wildland Urban Interface Project	Yes, take anticipated; not possible to quantify. FWS concludes that IT of LCS will be exceeded if there are declines or poor ratings in upland or stream state conditions measured by BMPs and/or the BMPs are inadequate in preventing sediment transport as determined by monitoring.
02-21-05-F-0385	May 18, 2006 (draft)	Nutriosos Wildland Urban Interface Project	Yes, take anticipated; not able to quantify. FWS concludes that IT of LCS will be exceeded if: there are declines in stream functioning conditions; effects to LCS are greater than those disclosed in the BAE; and/or, there is a decline in LCS constituent elements due to proposed action.
02-21-02-F-0206	In progress	East Clear Creek Watershed Health Project	None anticipated
02-21-05-I-0316	Formal consultation not initiated yet	C.C. Cragin Reservoir	Formal consultation not yet initiated.

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

Table 2. Grazing pastures affected by the Rodeo-Chediski (RC) Fire and Proposed Livestock Management, Carlisle Complex Allotment, Lakeside Ranger District, Apache-Sitgreaves National Forest.				
Sub-Allotment	Pasture	Acres Burned	Post RC Fire Grazing	Proposed Management
Capps	Capps	3,948	Grazed in part in 2002, full pasture in 2003	Rest-Rotation Year Round
Dodson	Cactus Flat	807	Insignificant portion burned – currently grazed	Rest-Rotation Year Round then move towards winter only
	Rattlesnake	0	N/A	Rest-Rotation Year Round then move towards winter only
	Walker Lake	0	N/A	Rest-Rotation Year Round then move towards winter only
	Wilson	1,049	Insignificant portion burned – currently grazed	Rest-Rotation Year Round then move towards winter only
Juniper Ridge	Bull	50	“ “	Spring-Summer use only
	East Bull	452	“ “	Spring-Summer use only
	South J. Ridge	2,187	Grazed in 2006 ¹	Growing Season use only
Linden	Blue Grass	618	Insignificant portion burned – currently grazed	Rest-Rotation Year Round
	Bull Hollow	0	N/A	Rest-Rotation Year Round then move towards winter only
	Fence Tank	4,782	Grazed in 2006 ¹	Growing Season use only
	Show Low Riparian	0	N/A	Non Growing Season only
	Show Low	0	N/A	Rest-Rotation Year Round
	Thistle	0	N/A	Rest-Rotation Year Round then move towards winter only
McNeil	East McNeil	0	N/A	Not currently use – lack of fencing
	West McNeil	0	N/A	Growing season use only
Pinedale	Bear Canyon	4,253	Grazed in 2006	Growing season use only
	Burn	432	Grazed in 2005	Growing season use only
	Clay Spr East	0	N/A	Rest-Rotation Year Round
	Deer Lick	1,094	Grazed in 2005	Growing Season Use only
	E. Cottonwood	3,092	Grazed in 2005	Growing Season Use only
	FS Horse	95	Not grazed since 2002	Rest until recovered

	Lons	8,257	Grazed in 2006 ¹	Rest-Rotation Year Round
	Mortensen	1,802	Grazed in part in 2002 (fenced) full pasture in 2003	Rest until recovered
	Owens	659	Grazed in 2004 ¹	Rest-Rotation Year Round
	Pinedale	1,363	Grazed in 2006	Growing Season Use only
	Winter	273	Insignificant portion burned – currently grazed	Rest-Rotation Year Round

¹Once a pasture is returned to the rotation schedule it remains so in the future. These pastures are considered recovered.