Mr. Deryl Jevons
Acting Forest Supervisor
Apache-Sitgreaves National Forest
PO Box 640
Springerville, Arizona 85938-0640

Re: Wildbunch Allotment Management Plan

Dear Mr. Jevons:

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 October 13, 2006, and received by us on October 17, 2006. At issue are impacts that may result from the proposed 10-year grazing permit for the Wildbunch Allotment (WBA) located on the Clifton Ranger District in Greenlee County, Arizona. The proposed action may affect threatened Mexican spotted owl (MSO: *Strix occidentalis lucida*) and its critical habitat, Chiricahua leopard frog (*Rana chiricahuensis*), loach minnow (*Tiaroga cobitis*) and its critical habitat, spikedace (*Meda fulgida*), and endangered Gila chub (*Gila intermedia*).

You also requested our concurrence that the proposed project may affect, but is not likely to adversely affect, endangered Southwestern willow flycatcher (SWWF *Empidonax traillii extimus*), jaguar (*Panthera onca*), and threatened bald eagle (*Haliaeetus leucocephalus*). Additionally, the Forest determined that the proposed project is not likely to jeopardize Mexican gray wolf (*Canis lupus baileyi*). We concurred with these determinations in a letter dated November 14, 2006.

This biological opinion is based on information provided in the October 3, 2006, biological assessment, the October 1, 2006, draft environmental assessment, the September 2007 environmental assessment, the October 3, 2006, Wildlife Specialist’s Report, the September 22, 2006, Watershed Specialist’s Report, the September 25, 2006, Specialist’s Report regarding Riparian Resources on Wildbunch Allotment, telephone conversations and emails with wildlife and fisheries biologist, 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, livestock grazing, and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.
Consultation History

- October 13, 2006: The Forest requested formal consultation for the proposed issuance of a 10-year grazing permit for the Wildbunch Allotment.

- November 14, 2006: We sent a 30-day letter initiating formal consultation. Included within that letter were concurrences with your determinations for southwestern willow flycatcher, bald eagle, jaguar, and Mexican gray wolf.

- February 23, 2007: We sent a letter asking for a 60-day extension to complete the consultation process due to workload constraints.

- May 24, 2007: A draft biological opinion was sent to the Forest along with a second request to extend the consultation period.

- October 16, 2007: The Forest provided comments on the draft biological opinion. Additionally, the Forest provided the September 2007 final Draft Environmental Assessment and a biological assessment and evaluation addendum.

- January 17, 2008: A second draft biological opinion was sent to the Forest to reflect changes in the proposed action. We also requested an extension of the consultation period to allow adequate time to review the proposed changes. The consultation was extended to August 29, 2008 to allow the Forest Service to review the second draft biological opinion.

- July 29, 2008: The Forest provided comments on the second draft biological opinion.
**BIOLOGICAL OPINION**

**DESCRIPTION OF THE PROPOSED ACTION**

The Proposed Action is fully described in the environmental analysis for the WBA management plan. This action will provide for year-long grazing on the WBA, tank maintenance, and cattle movement. Based on maximum utilization levels and the existing range developments, capacity would be 158 cow/calf pairs (c/c) and 8 horses. However, additional range developments are proposed which would increase livestock distribution thereby increasing the forage available for grazing and increasing livestock numbers by 86 c/c for a total of 246 c/c (no increase in horses). It provides 7-24 months of non-grazing between grazing periods in the main pastures with the objective of providing vegetation time to grow without livestock impacts. Table 1 contains maximum grazing utilization levels and capacities with and without additional range developments.

The proposed action splits (fences) South Pasture into High Mesa Pasture and Zumwalt Pasture (Appendix A: Map 1). The main pastures are: High Mesa, Zumwalt, North /Joe Fritz (hereafter NJF), Indian/Oak, Roan Cow, and Mud Springs. Maximum utilization levels are 25% in NJF due to soil type; 45% in Zumwalt, High Mesa, Indian/Oak and Mud Springs; and 35% in Roan Cow. For more details see Table 2 and also Table 3 for the complete list of prioritized range developments for this alternative. The Blue River remains fenced and excluded from grazing except for transport of cattle on an as-needed basis (Map 1).

A list of range developments with associated increase in AUMs is in Table 3 below. Certain range developments are expected to help distribute livestock into additional areas. As such, more forage and thus capacity would be available. Because capacity is based in part on range developments that are expected to increase distribution and available forage, each number/development scenario would therefore be considered “proper stocking” and determinations are based on proper stocking. However, the Forest has recommended that certain developments be constructed first to better ensure riparian habitat protection and recovery. Further, the improvements would allow for comparison of fenced and non-fenced riparian areas to document the effects of grazing management on riparian habitat over time. Currently the Forest does not have the funds to complete all of the range improvements. Therefore, effects to species are analyzed as though range improvements may or may not occur during the life of the proposed project. Range improvements will help increase capacity and will allow for better distribution of cattle and quicker recovery of the allotment. Effects to species are analyzed with the assumption that these improvements will not occur and recovery of the allotment may take longer to achieve.
Mr. Deryl Jevons

Table 1. Proposed action maximum grazing utilization levels and livestock capacity with range developments*.

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<th>Proposed Action</th>
<th>Year Long, 3 Year Schedule</th>
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<tr>
<td></td>
<td>Maximum Allowable Use Levels of Herbaceous Species in Upland Key Areas</td>
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<td>Pasture</td>
<td>Year 1</td>
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<td>Horse (All Pastures)</td>
<td>35%/45%</td>
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<td>Indian/Oak</td>
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<td>Little</td>
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<td>Mud Springs</td>
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<td>North/Joe Fritz (NJF)</td>
<td>25%</td>
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<td>Roan Cow</td>
<td>35%</td>
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<td>South (Zumwalt)</td>
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<td>South (High Mesa)</td>
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<td>Upland Browse Species</td>
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<td>Riparian</td>
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<td>Current On-going Grazing Capacity</td>
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<td>AUM/Number</td>
<td>2,320</td>
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<tr>
<td>Capacity with Additional Developments AUM/Number</td>
<td>1,305</td>
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<tr>
<td>Proposed Action Maximum AUMs/Number</td>
<td>3,625</td>
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*Utilization levels: 35% April through October; 45% November through March; use set lower in NJF due to No Capacity soil type.

Joe Fritz Trap, Weaning Trap, and Sandrock Trap would be used for livestock gathering, working cattle, and shipping. Little Pasture which is primarily in very poor condition would initially only be used by cattle trailing along the road during pasture moves. This pasture is proposed to be seeded (approximately 300 acres) (as funding becomes available). It will not be used in the normal rotation until the pasture achieves at least 10% vegetative ground cover (minimum tolerance ground cover for the soil type found in Little Pasture as described in the Terrestrial Ecosystem Survey for the Apache-Sitgreaves NFs) or mid-seral ecological condition (USDA 1987a). Once it has reached this level, it would enter the main rotation with a maximum utilization level of 25%. Little Pasture would also be split (Development #11) into two pastures to provide additional rotation for horse use.

The Horse Pasture has areas of very poor, poor, and fair condition. Horse Pasture could be split (Development #16) to create two horse pastures. Once fenced, a portion of the Little Pasture as noted above would provide a third horse pasture. Until Developments #15 and #16 are completed, the Horse Pasture will be rested during the months of April and May, and during August and September to allow growing season rest for cool and warm season grass species and browse. See Table 2 for the rotation schedule for the Horse Pastures.
About 300 acres will be seeded in High Mesa (as funding becomes available) and fenced until it achieves at least 45% vegetative ground cover (minimum tolerance ground cover for the soil type found in High Mesa as described in the Terrestrial Ecosystem Survey for the Apache-Sitgreaves NFs) and/or mid-seral ecological condition (USDA 1987a). Once this level is reached, the fence will be removed.

It would take three years to get through the full pasture rotation as noted in Table 2. This would provide 7 to 24 months of non-grazing between scheduled grazing periods in the main pastures. The non-use is expected to be long enough to recover both cool and warm season growing seasons in each pasture. Table 2 has more details and shows how the use and non-use periods in all pastures compare to the cool and warm season growing periods.
Table 2. Proposed Action pasture rotation schedule with associated maximum utilization levels and rest periods, and as compared to warm and cool growing seasons.

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*Typically at these elevations, the heart of cool season plant growth occurs in March and April with some shift or extension into the late half of February and/or into the early half of May; the heart of the warm season plant growth occurs in August and September with some shift or extension into the late half of July and/or into the early half of October; some addition cool season growth may occur late October into early November; all growing seasons are dependent on appropriate growing temperatures coupled with adequate amounts of moisture. Colors representation: blue is the cool season; green is the warm season; and yellow represents when the livestock are planned to be in the pasture.
Pasture Moves: Generally, pasture moves will occur once utilization standards are reached in either key areas or critical (riparian) areas. Pasture moves may also be dictated by the rotation schedule as outlined in the annual operating instructions. However, pasture moves may also be based on other factors like water availability, seasonal utilization, time of year of use, length of time livestock have been in a pasture, expected amount of regrowth and necessary rest periods may require pasture moves even if utilization standards have not been reached.

Flexible and adaptive management: Use dates for each pasture may be adjusted as necessary to be adaptable to changes in precipitation, growing season, and herbaceous or woody species production. Year to year actual use dates are not expected to vary significantly. For example, a pasture scheduled for winter use would not normally be used in July or August. However actual use dates may vary by a few days to a week or more on either side of the planned or scheduled use dates depending on climatic factors and forage growth rates and recovery.

One objective of requiring production estimates prior to using a pasture is so the manager can have time to adjust numbers of livestock as needed. Actual numbers of livestock on the allotment are expected to fluctuate annually in response to climatic conditions. Conducting monitoring during pasture use will provide the manager information on current conditions in order to manage the livestock accordingly.

Livestock Removal and Transporting: Livestock removed from the allotment will normally be transported with trucks and/or trailers, crossing the Blue River at the FS 475 road crossing. Livestock may be herded across the river at the same location during emergency situations where trucking is not practical or safe (i.e. inclement weather and poor road conditions). Herding across the Blue River will be authorized on an as-needed basis. Livestock will not be authorized to be herded from the allotment through Johnson Canyon, up the Blue River and to the Clear Creek Pens as historically occurred. However, use of the Clear Creek shipping corrals located on the adjacent Sandrock Allotment is authorized to facilitate sorting and transporting.

Developments: All range fence reconstruction or new fences will be built according for Forest Service Region 3 specifications for wildlife passage. All watering troughs would include wildlife escape ramps.

Table 3. Range Developments for the Proposed Action

<table>
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<tr>
<th>Dev. No.</th>
<th>Development</th>
<th>Purpose</th>
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<tbody>
<tr>
<td>1</td>
<td>South Pasture Division Fence</td>
<td>Divide South Pasture. A similar fence was proposed in the 1967 range analysis.</td>
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<tr>
<td>2</td>
<td>Refurbish Morris Day Gap Spring</td>
<td>Refurbish water system to improve water efficiency, construct an exclosure fence around the spring source for protection and provide for wildlife use.</td>
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<td>3</td>
<td>Cienega Creek Exclosure</td>
<td>Exclude livestock use on 1.5 miles of Cienega Canyon above Cienega Cabin with the exception of 2 water gaps.</td>
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<td>4</td>
<td>Indian Creek Exclosure</td>
<td>1.2 miles of new fence to exclude livestock from approximately 0.7 miles of Indian Creek in the north end of the pasture.</td>
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<td></td>
<td>Description</td>
<td>Details</td>
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<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>Indian – Zumwalt Drift Fence</td>
<td>Control livestock drift between pastures.</td>
</tr>
<tr>
<td>6</td>
<td>Cienega Well (South Pasture Pipeline)</td>
<td>Install a well near Cienega Cabin to supply an alternate source of water to South Pasture.</td>
</tr>
<tr>
<td>7</td>
<td>Roan Cow Trick Tank</td>
<td>Provide additional water to the east side of Roan Cow Pasture.</td>
</tr>
<tr>
<td>8</td>
<td>Roan Cow Pasture Division Fence</td>
<td>Fence will split Roan Cow Pasture making a west pasture (Roan Cow) and an east (Dry Prong) pasture.</td>
</tr>
<tr>
<td>9</td>
<td>Mud Springs Pasture Drift Fences</td>
<td>To better control livestock use in Wildbunch and Mud Springs Canyons.</td>
</tr>
<tr>
<td>10</td>
<td>Horse Pasture Division Fence</td>
<td>To divide Horse pasture to increase management effectiveness for rest and recovery.</td>
</tr>
<tr>
<td>11</td>
<td>Little Pasture Fence</td>
<td>Provide an additional horse pasture to provide greater flexibility and extended rest periods for each.</td>
</tr>
<tr>
<td>12</td>
<td>Little Pasture Seeding</td>
<td>Provide quicker recovery of 290 acres and reduce the amount of sediment transport into the Blue River.</td>
</tr>
<tr>
<td>13</td>
<td>High Mesa Seeding</td>
<td>Provide quicker recovery of 300 acres.</td>
</tr>
<tr>
<td>14</td>
<td>Stock Tank Water lots</td>
<td>Control livestock use of stock tanks and surrounding areas.</td>
</tr>
<tr>
<td>15</td>
<td>Coalson Peak Trail</td>
<td>Provide access between Mud Springs and Roan Cow Pastures.</td>
</tr>
<tr>
<td>N/A</td>
<td>Zumwalt Corner Trick Tank</td>
<td>Listed in Scoping Report but dropped from further consideration. No longer necessary with the extension of the proposed pipeline in South Pasture.</td>
</tr>
<tr>
<td>N/A</td>
<td>Water tank and trough in Little Pasture.</td>
<td>Listed in Scoping Report but dropped from further consideration. Livestock will have access to the private portion of Johnson Canyon.</td>
</tr>
<tr>
<td>N/A</td>
<td>Johnson Canyon Exclosure</td>
<td>Exclude use along the Forest portion of Johnson Canyon. Listed in Scoping Report and Pre-decisional EA. This improvement has been covered under separate analysis. The cost of this improvement is retained in the economic analysis as a connected action.</td>
</tr>
<tr>
<td>N/A</td>
<td>Spring Exclosure</td>
<td>Listed in Scoping Report and Pre-decisional EA. Exclosures are included in proposed improvements #3 and 13.</td>
</tr>
</tbody>
</table>
Table 4: Potential increases in AUMs by improvements and pasture.

<table>
<thead>
<tr>
<th>Improvement</th>
<th>Pasture</th>
<th>Potential Increase in AUMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 – South Pasture Fence</td>
<td>South – Zumwalt Portion</td>
<td>143</td>
</tr>
<tr>
<td>#2 Morris Day Gap Spring</td>
<td>Mud Springs</td>
<td>100</td>
</tr>
<tr>
<td>#3 Cienega Creek Exclosure (North)</td>
<td>Roan Cow</td>
<td>133</td>
</tr>
<tr>
<td>#3 Cienega Creek Exclosure (South)</td>
<td>South – High Mesa Portion</td>
<td>75</td>
</tr>
<tr>
<td>#6 Cienega Well (South Pasture Pipeline)</td>
<td>South High Mesa Portion</td>
<td>75</td>
</tr>
<tr>
<td>#6 Cienega Well (South Pasture Pipeline)</td>
<td>South – Zumwalt Portion</td>
<td>290</td>
</tr>
<tr>
<td>#8 Roan Cow Pasture Division Fence</td>
<td>Roan Cow</td>
<td>152</td>
</tr>
<tr>
<td>#9 Mud Spring Pastured Drift Fence</td>
<td>Mud Springs</td>
<td>100</td>
</tr>
<tr>
<td>#12 – Little Pasture Seeding</td>
<td>Little</td>
<td>90</td>
</tr>
<tr>
<td>#13 High Mesa Seeding</td>
<td>South – High Mesa Portion</td>
<td>60</td>
</tr>
<tr>
<td>#15 Coalson Peak Trail</td>
<td>Mud Springs</td>
<td>67</td>
</tr>
<tr>
<td>Total Capacity Estimates (AUMs)</td>
<td></td>
<td>1285</td>
</tr>
</tbody>
</table>

Action Area
According to the FWS’s section 7 Handbook, the action area includes all areas affected by direct and indirect effects. For this consultation, the action area encompasses the Wildbunch Allotment downstream on the San Francisco River to the Forest Service boundary. The elevation ranges from 3,880 feet to 8,080 feet. This includes the length of the Blue River that flows on the western boundary of the Wildbunch Allotment and a portion of the San Francisco River above the Blue confluence. This also includes the major riparian areas of the Wildbunch Allotment (Rock Tank Canyon, Wildbunch Canyon, Mud Springs Canyon, Johnson Canyon, Cienega Creek, Indian Creek, and Oak Creek).

STATUS OF THE SPECIES AND CRITICAL HABITAT

Mexican spotted owl

The MSO was listed as a threatened species in 1993 (USDI 1993). The primary threats to the species were cited as even-aged timber harvest and stand-replacing wildfire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the MSO population. The Fish and Wildlife Service appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) in 1995 (USDI 1995).

A detailed account of the taxonomy, biology, and reproductive characteristics of the MSO is found in the Final Rule listing the MSO as a threatened species (USDI 1993) and in the Recovery Plan (USDI 1995). The information provided in those documents is included herein by reference. Although the MSO’s entire range covers a broad area of the southwestern United States and Mexico, the MSO does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, uneven-aged forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.
The U.S. range of the MSO has been divided into six recovery units (RU), as discussed in the Recovery Plan. The primary administrator of lands supporting the MSO in the United States is the Forest Service. Most owls have been found within Forest Service Region 3 (including 11 National Forests in Arizona and New Mexico). Forest Service Regions 2 and 4 (including two National Forests in Colorado and three in Utah) support fewer owls. According to the Recovery Plan, 91 percent of MSO known to exist in the United States between 1990 and 1993 occurred on lands administered by the Forest Service.

Historical and current anthropogenic uses of MSO habitat include both domestic and wild ungulate grazing, recreation, fuels reduction treatments, resource extraction (e.g., timber, oil, gas), and development. These activities have the potential to reduce the quality of MSO nesting, roosting, and foraging habitat, and may cause disturbance during the breeding season. Livestock and wild ungulate grazing is prevalent throughout Region 3 National Forest lands and is thought to have a negative effect on the availability of grass cover for prey species. Recreation impacts are increasing on all forests, especially in meadow and riparian areas. There is anecdotal information and research that indicates that owls in heavily used recreation areas are much more erratic in their movement patterns and behavior. Fuels reduction treatments, though critical to reducing the risk of severe wildfire, can have short-term adverse effects to MSO through habitat modification and disturbance. As the population grows, especially in Arizona, small communities within and adjacent to National Forest System lands are being developed. This trend may have detrimental effects to MSO by further fragmenting habitat and increasing disturbance during the breeding season. West Nile Virus also has the potential to adversely impact the MSO. The virus has been documented in Arizona, New Mexico, and Colorado, and preliminary information suggests that owls may be highly vulnerable to this disease (Courtney et al. 2004). Unfortunately, due to the secretive nature of owls and the lack of intensive monitoring of banded birds, we will most likely not know when owls contract the disease or the extent of its impact to MSO range-wide.

Currently, high-intensity, stand-replacing fires are influencing ponderosa pine and mixed conifer forest types in Arizona and New Mexico. Uncharacteristic, severe, stand-replacing wildfire is probably the greatest threat to MSO within the action area. As throughout the West, fire severity and size have been increasing within this geographic area.

A reliable estimate of the numbers of owls throughout its entire range is not currently available (USDI 1995) and the quality and quantity of information regarding numbers of MSO vary by source. USDI (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. However, Ganey et al. (2000) estimates approximately 2,950 ± 1,067 (SE) MSOs in the Upper Gila Mountains RU alone. The Forest Service Region 3 most recently reported a total of approximately 1,025 PACs established on National Forest System (NFS) lands in Arizona and New Mexico (B. Barrera, pers. comm. June 18, 2007). The FS Region 3 data are the most current compiled information available to us; however, survey efforts in areas other than NFS lands have resulted in additional sites being located in all Recovery Units.

Researchers studied MSO population dynamics on one study site in Arizona (n = 63 territories) and one study site in New Mexico (n = 47 territories) from 1991 through 2002. The Final Report, titled “Temporal and Spatial Variation in the Demographic Rates of Two Mexican
Spotted Owl Populations,” (in press) found that reproduction varied greatly over time, while survival varied little. The estimates of the population rate of change ($\Lambda=Lamda$) indicated that the Arizona population was stable (mean $\Lambda$ from 1993 to 2000 = 0.995; 95 percent Confidence Interval = 0.836, 1.155) while the New Mexico population declined at an annual rate of about 6 percent (mean $\Lambda$ from 1993 to 2000 = 0.937; 95 percent Confidence Interval = 0.895, 0.979). The study concludes that spotted owl populations could experience great (>20 percent) fluctuations in numbers from year to year due to the high annual variation in recruitment. However, due to the high annual variation in recruitment, the MSO is then likely very vulnerable to actions that impact adult survival (e.g., habitat alteration, drought, etc.) during years of low recruitment.

Since the owl was listed, we have completed or have in draft form a total of 196 formal consultations for the MSO. These formal consultations have identified incidences of anticipated incidental take of MSO in 408 PACs. The form of this incidental take is almost entirely harm or harassment, rather than direct mortality. These consultations have primarily dealt with actions proposed by Forest Service Region 3. However, in addition to actions proposed by Forest Service Region 3, we have also reviewed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military and sightseeing overflights, and other activities. Only two of these projects (release of site-specific owl location information and existing forest plans) have resulted in biological opinions that the proposed action would likely jeopardize the continued existence of the MSO. The jeopardy opinion issued for existing Forest Plans on November 25, 1997 was rendered moot as a non-jeopardy/no adverse modification BO was issued the same day.

In 1996, we issued a biological opinion on FS Region 3 adoption of the Recovery Plan recommendations through an amendment to their Land and Resource Management Plans (LRMPs). In this non-jeopardy biological opinion, we anticipated that approximately 151 PACs would be affected by activities that would result in incidental take of MSOs. In addition, on January 17, 2003, we completed a reinitiation of the 1996 Forest Plan Amendments biological opinion, which anticipated the additional incidental take of five MSO PACs in Region 3 due to the rate of implementation of the grazing standards and guidelines, for a total of 156 PACs. Consultation on individual actions under these biological opinions resulted in the harm and harassment of approximately 243 PACs on Region 3 NFS lands. FS Region 3 reinitiated consultation on the LRMPs on April 8, 2004. On June 10, 2005, the FWS issued a revised biological opinion on the amended LRMPs. We anticipated that while the Region 3 Forests continue to operate under the existing LRMPs, take is reasonably certain to occur to an additional 10 percent of the known PACs on NFS lands. We expect that continued operation under the plans will result in harm to 49 PACs and harassment to another 49 PACs. To date, consultation on individual actions under the amended Forest Plans, as accounted for under the June 10, 2005, biological opinion has resulted in the incidental take of owls associated with 39 PACs. Incidental take associated with Forest Service fire suppression actions, which was not included in the LRMP proposed action, has resulted in the incidental take of owls associated with 14 PACs.
Mr. Deryl Jevons

Mexican spotted owl critical habitat

The final MSO critical habitat rule (USDI 2004) designated approximately 8.6 million acres of critical habitat in Arizona, Colorado, New Mexico, and Utah, mostly on Federal lands (USDI 2004). Within this larger area, critical habitat is limited to areas that meet the definition of protected and restricted habitat, as described in the Recovery Plan. Protected habitat includes all known owl sites and all areas within mixed conifer or pine-oak habitat with slopes greater than 40 percent where timber harvest has not occurred in the past 20 years. Restricted habitat includes mixed conifer forest, pine-oak forest, and riparian areas outside of protected habitat.

The primary constituent elements for proposed MSO critical habitat were determined from studies of their habitat requirements and information provided in the Recovery Plan (USDI 1995). Since owl habitat can include both canyon and forested areas, primary constituent elements were identified in both areas. The primary constituent elements which occur for the MSO within mixed-conifer, pine-oak, and riparian forest types that provide for one or more of the MSO’s habitat needs for nesting, roosting, foraging, and dispersing are in areas defined by the following features for forest structure and prey species habitat:

Primary constituent elements related to forest structure include:

- A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with diameter-at-breast height (dbh) of 12 inches or more;
- A shade canopy created by the tree branches covering 40 percent or more of the ground; and,
- Large, dead trees (snags) with a dbh of at least 12 inches.

Primary constituent elements related to the maintenance of adequate prey species include:

- High volumes of fallen trees and other woody debris;
- A wide range of tree and plant species, including hardwoods; and
- Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration.

The forest habitat attributes listed above usually are present with increasing forest age, but their occurrence may vary by location, past forest management practices or natural disturbance events, forest-type productivity, and plant succession. These characteristics may also be observed in younger stands, especially when the stands contain remnant large trees or patches of large trees. Certain forest management practices may also enhance tree growth and mature stand characteristics where the older, larger trees are allowed to persist.
**Chiricahua leopard frog**

We listed the CLF as a threatened species without critical habitat on June 13, 2002 (U.S. Fish and Wildlife Service 2002). We included a special rule to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Act. A recovery plan was completed in April 2007 (U.S. Fish and Wildlife Service 2007a). This frog is distinguished from other members of the *Rana pipiens* complex by a combination of distinctive morphological and genetic characters, and a distinctive call (Platz and Mecham 1979, Davidson 1996, Stebbins 2003). Threats to CLF include predation by nonnative organisms, especially bullfrogs (*Rana catesbeiana*), fish (including fish in the family Centrarchidae, such as *Micropterus* spp. and *Lepomis* spp.), and crayfish (*Orconectes virilis* and possibly others); disease; drought; floods; degradation and loss of habitat as a result of water diversions and groundwater pumping, improper livestock management, altered fire regimes due to fire suppression and livestock grazing, mining, development, and other human activities; disruption of metapopulation dynamics; increased chance of extirpation or extinction resulting from small numbers of populations and individuals; and environmental contamination. CLF has disappeared from more than 75 percent of its historical localities (Clarkson and Rorabaugh 1989, Jennings 1995, Rosen et al. 1996, Sredl et al. 1997, Painter 2000, FWS files). Loss of CLF populations is part of a pattern of global amphibian decline, suggesting other regional or global causes of decline may be important as well (Carey et al. 2001).

The CLF is an inhabitant of cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 feet in central and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico, northern Sonora, and the Sierra Madre Occidental of Chihuahua (Platz and Mecham 1984, Degenhardt et al. 1996, Sredl et al. 1997, Sredl and Jennings 2005). In New Mexico, of sites occupied by CLFs from 1994-1999, 67 percent were creeks or rivers, 17 percent were springs or spring runs, and 12 percent were stock tanks (Painter 2000). In Arizona, slightly more than half of all known historical localities are natural lotic systems, a little less than half are stock tanks, and the remaining locations are lakes and reservoirs (Sredl et al. 1997). Sixty-three percent of populations extant in Arizona from 1993-1996 were found in stock tanks (Sredl and Saylor 1998).

Northern populations of the CLF along the Mogollon Rim and in the mountains of west-central New Mexico are disjunct from those in southeastern Arizona, southwestern New Mexico, and Mexico. Recent genetic analyses support describing the northern populations as a distinct species (Benedict and Quinn 1999, Platz and Grudzien 1999, Goldberg et al. 2004). Goldberg et al. (2004) present evidence that *R. subaquavocalis* (Ramsey Canyon leopard frog) and *R. chiricahuensis* may be conspecific.

The species is still extant in most major drainages in Arizona and adjacent areas of New Mexico where it occurred historically, with the exception of the Little Colorado River drainage in Arizona and possibly the Yaqui drainage in New Mexico (Painter 2000, Sredl et al. 1997, FWS files). However, it has not been found recently in many rivers, valleys, and mountain ranges, including the following in Arizona: White River, West Clear Creek, Tonto Creek, Verde River mainstem, San Francisco River, San Carlos River, upper San Pedro River mainstem, Santa Cruz River mainstem, Aravaipa Creek, Babocomari River mainstem, and Sonora Creek mainstem. In southeastern Arizona, no recent records (1995 to the present) exist for the following mountain ranges or valleys: Pinaleno Mountains, Peloncillo Mountains, Sulphur Springs Valley, and
Huachuca Mountains. Moreover, the species is now absent from all but one of the southeastern Arizona valley-bottom cienega complexes. In many of these regions, CLFs were not found for a decade or more despite repeated surveys. Recent surveys suggest that the species may have recently disappeared from some of the major drainages in New Mexico (R. Jennings, pers. comm. 2004).

Disruption of metapopulation dynamics is likely an important factor in regional loss of populations (Sredl et al. 1997, Sredl and Howland 1994). CLF populations are often small and habitats are dynamic, resulting in a relatively low probability of long-term population persistence.

The dispersal abilities of CLFs are key to determining the likelihood that suitable habitats will be colonized from a nearby extant population. Evidence exists to show substantial movements of leopard frogs and passive movement of tadpoles along stream courses. Current guidance supported by scientific literature suggests dispersal of CLF can be up to one mile overland, three miles within intermittent drainages, and five miles within perennial drainages. Dispersal of this species is largely thought to occur during the summer monsoon.

Within the last decade, a chytridiomycete skin fungus (*Batrachochytrium dendrobatidis*) has been recognized as an important contributor to global declines of frogs, toads, and salamanders (Speare and Berger 2000, Longcore et al. 1999, Berger et al. 1998, Daszak 2000, Hale 2001). The chytrid fungus does not have an airborne spore, so it must spread via other means. Amphibians in the international pet trade (Europe and USA), outdoor pond supplies (USA), zoo trade (Europe and USA), laboratory supply houses (USA), and species recently introduced (*Bufo marinus* in Australia and bullfrog in the USA) have been found infected with chytrids, suggesting human-induced spread of the disease (Daszak 2000, Mazzoni et al. 2003). Free-ranging healthy bullfrogs with low-level chytriodiomycosis infections have been found in southern Arizona (Bradley et al. 2002). Other native or nonnative frogs may serve as disease vectors or reservoirs of infection, as well (Bradley et al. 2002). If chytrids were introduced to the Southwest via escaped or released African clawed frogs, then the disease may have spread across the landscape by human introductions or natural movements of secondarily-infected American bullfrogs, tiger salamanders, leopard frogs, or other anurans.

Chytrids could also be spread by people (and terrestrial animals) moving among various tanks and/or by personnel sampling aquatic habitats (Halliday 1998). The fungus can exist in water or mud and could be spread by wet or muddy boots, vehicles, cattle, and other animals moving among aquatic sites, or during scientific sampling of fish, amphibians, or other aquatic organisms.

Numerous studies indicate that declines and extirpations of CLFs are at least in part caused by predation and possibly competition by nonnative organisms, including fish in the family Centrarchidae, bullfrogs, tiger salamanders (*Ambystoma tigrinum mavortium*), crayfish, and several other species of fish (Fernandez and Rosen 1996; 1998; Rosen et al. 1994; 1996; Snyder et al. 1996; Fernandez and Bagnara 1995; Sredl and Howland 1994; Clarkson and Rorabaugh 1989).

The Recovery Plan for CLF (U.S. Fish and Wildlife Service 2007a) delineated eight recovery units in key areas that were targeted as valuable in the recovery of this species. The action area
for this proposed action lies within Recovery Unit 7, which straddles the border between Arizona and New Mexico and includes portions of the upper reaches of the Gila River and Mule Creek in New Mexico and the Blue River in Arizona. Vegetation communities in this recovery unit range from riparian and Chihuahuan Desert scrub along the Gila River to mixed conifer at the higher elevations. There are four management areas (San Francisco River Management Area, Lemmons Peak Management Area, Mule Creek Management Area, and Burro Mountain Management Area). However, the action area for this project resides within the Mule Creek Management Area.

Within Recovery Unit 7, Chiricahua leopard frogs were historically well-distributed in at least the New Mexico portion of the Recovery Unit. Few records exist for the Arizona portion of the Recovery Unit, but the species is still extant on Coal Creek and two adjacent tributaries of the San Francisco River and a nearby stock tank south of the San Francisco River.


Given the range of this species, several Federal actions affect this species every year. A complete list of all consultations affecting this species can be found on our website (http://www.fws.gov/southwest/es/arizona/) by clicking on the “Document Library” tab and then on the “Section 7 Biological Opinions” tab. Survey work and recovery projects also occur periodically, and are summarized in the appropriate land-management agency or AGFD documents as well as in the BAE associated with this project.

Loach minnow and its critical habitat

The critical habitat designation listed primary constituent elements that are essential for the conservation of loach minnow. The PCEs are summarized below:

1. Permanent, flowing, water with no or minimal pollutant levels;

2. Sand, gravel, and cobble substrates with low or moderate amounts of fine sediment and substrate embeddedness. Suitable levels of embeddedness are generally maintained by a natural, unregulated hydrograph that allows for periodic flooding or, if flows are modified or regulated, a hydrograph that allows for adequate river functions, such as flows capable of transporting sediments.

3. Streams that have low gradients, water temperatures (between 35-85°F Fahrenheit), pool, riffle, run, and backwater components, and an abundant aquatic insect food base.

4. Habitat devoid of nonnative fish species detrimental to loach minnow or habitat in which detrimental nonnative fish species are at levels which allow persistence of loach minnow.

5. Areas within perennial, interrupted stream courses which are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted.

The appropriate and desirable level of these factors may vary seasonally and is highly influenced by site-specific circumstances. Therefore, assessment of the presence/absence, level, or value of the constituent elements must include consideration of the season of concern and the characteristics of the specific location. The PCEs are not independent of each other and must be assessed holistically, as a functioning system, rather than individually. In addition, the constituent elements need to be assessed in relation to larger habitat factors, such as watershed, floodplain, and streambank conditions, stream channel geomorphology, riparian vegetation, hydrologic patterns, and overall aquatic faunal community structure.

The status of loach minnow is declining rangewide. Loach minnow currently exist in approximately 419 miles of streams, which represents only 15 to 20 percent of their historical range. In occupied areas, loach minnow may be common to very rare. Loach minnow are common only in Aravaipa Creek, the Blue River, and limited portions of the San Francisco, upper Gila, and Tularosa rivers in New Mexico (U.S. Fish and Wildlife Service 2000a). Although it is currently listed as threatened, the FWS has found that a petition to uplist the species to endangered status is warranted. A reclassification proposal is pending; however, work on it is precluded due to work on other higher priority listing actions (U.S. Fish and Wildlife Service 1994).

**Spikedace**

Spikedace was listed as a threatened species on July 1, 1986 (51 FR 23769). Critical habitat was finalized on March 21, 2007 and includes several PCEs (U.S. Fish and Wildlife Service 2007b). Critical habitat does not occur within the action area. Spikedace is a small silvery fish whose common name alludes to the well-developed spine in the dorsal fin (Minckley 1973). Spikedace historically occurred throughout the mid-elevations of the Gila River drainage, but is currently
known only from the middle, and upper Gila River, and Aravaipa and Eagle creeks (Barber and Minckley 1966, Minckley 1973, Anderson 1978, Marsh et al. 1990, Sublette et al. 1990, Jakle et al. 1992, Knowles 1994, Rinne 1999). The species also likely occurs in the upper Verde River, but in very low numbers. It has not been documented in the Verde River since 1999 despite annual surveys; additional survey work is needed to verify its current status. Habitat destruction along with competition and predation from introduced nonnative species are the primary causes of the species decline (Miller 1961, Williams et al. 1985, Douglas et al. 1994).

Spikedace live in flowing water with slow to moderate velocities over sand, gravel, and cobble substrates (Propst et al. 1986, Rinne and Kroeger 1988). Specific habitat for this species consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at the downstream riffle edges (Propst et al. 1986). Spikedace spawns from March through May with some yearly and geographic variation (Barber et al. 1970, Anderson 1978, Propst et al. 1986). Actual spawning has not been observed in the wild, but spawning behavior and captive studies indicate eggs are laid over gravel and cobble where they adhere to the substrate. Spikedace lives about two years with reproduction occurring primarily in one-year old fish (Barber et al. 1970, Anderson 1978, Propst et al. 1986). It feeds primarily on aquatic and terrestrial insects (Schreiber 1978, Barber and Minckley 1983, Marsh et al. 1989).

Taxonomic and genetic work on spikedace indicates there are substantial differences in morphology and genetic makeup between remnant spikedace populations. Remnant populations occupy isolated fragments of the Gila basin and are isolated from each other. Anderson and Hendrickson (1994) found that spikedace from Aravaipa Creek are morphologically distinguishable from spikedace from the Verde River, while spikedace from the upper Gila River and Eagle Creek have intermediate measurements and partially overlap the Aravaipa and Verde populations. Mitochondrial DNA and allozyme analyses have found similar patterns of geographic variation within the species (Tibbets 1992, Tibbets 1993).

Our information indicates that, rangewide, more than 155 consultations have been completed or are underway for actions affecting spikedace and loach minnow. The majority of these opinions concerned the effects of grazing (approximately 34%), roads and bridges (approximately 15%), or agency planning (approximately 15%). The remaining 36% of consultations dealt with timber harvest, fire, flooding, recreation, realty, animal stocking, water development, recovery, and water quality issues.

The status of spikedace is declining rangewide. It is now restricted to approximately 289 miles of streams, and its present range is only 10 to 15 percent of its historical range. Within occupied areas, it is common to very rare, but is presently common only in Aravaipa Creek and some parts of the upper Gila River in New Mexico (U.S. Fish and Wildlife Service 2000a). Although it is currently listed as threatened, the FWS has found that a petition to uplist the species to endangered status is warranted. A reclassification proposal is pending; however, work on it is precluded due to work on other higher priority listing actions (U.S. Fish and Wildlife Service 1994).
Gila chub

The Gila chub was listed as endangered with critical habitat on November 2, 2005 (U.S. Fish and Wildlife Service 2005). Historically, Gila chub have been recorded from rivers, streams, and spring-fed tributaries throughout the Gila River basin in southwestern New Mexico, central and southeastern Arizona, and northern Sonora, Mexico (Miller and Lowe 1967, Rinne and Minckley 1970, Minckley 1973, Rinne 1976, DeMarais 1986, Weedman et al. 1996). Today the Gila chub has been restricted to small, isolated populations scattered throughout its historical range.

Critical habitat for Gila chub includes approximately 163 mi of stream reaches in Arizona and New Mexico (U.S. Fish and Wildlife Service 2005c). The seven primary constituent elements are described in the Federal Register Notice.

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.

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

Mexican spotted owl and its critical habitat

The Blue-San Francisco grazing consultation (U.S. Fish and Wildlife Service 2003) identified approximately 350 acres of lowland riparian restricted habitat along the Blue River. In addition there are approximately 251 acres of other riparian habitat within the WBA, primarily intermittent reaches and springs that are associated with canyon bottoms (U.S. Fish and Wildlife Service 1995). No surveys have been conducted within the allotment interior riparian areas. Surveys for MSO were conducted along the Blue River in 2003 with no detections of owls. No MSO surveys have been conducted on the San Francisco River on the south side of the WBA boundary. The closest MSO PACs are Walker Butte located approximately five miles to the west, Sardine located approximately seven miles to the west and Yam Canyon located ten miles to the north (Appendix A: Map 2). MSO were detected in Walker Butte PAC and Yam Canyon PAC in 2004, and in Sardine PAC in 2005, but survey efforts have been irregular.

MSO on the Clifton Ranger District are primarily found in ponderosa pine-Gambel oak habitat along drainage bottoms with nearby perennial water (streams or springs). The Sardine and Walker Butte MSO PACs are in drainages that are dominated by mid-size Gambel oak (up to 12” dbh) with limited ponderosa pine stringers and pinyon-juniper woodlands above the drainages. MSO in these two PACs may be nesting in cliffs. Both of these PACs have similar habitat to that found within upper Mud Springs Canyon on the WBA, although the flow in Mud Springs Canyon occurs intermittently.
Coalson Peak (8,079 ft) is located on the south side of Mud Springs canyon. The north side of the peak has some stringers of ponderosa pine, with small to mid size Gambel oak occurring along the lowest portion of the slope. While the pine-oak within Mud Springs Canyon does not meet MSO Recovery Plan definitions for this type of restricted habitat, the biological assessment notes that MSO often occur in marginal habitat on the Clifton RD. The riparian reaches of Mud Springs Canyon total about 48 acres. They occur about a mile down drainage of the pine and Gambel oak stringers. Upper Mud Springs Canyon therefore provides (although not extensively) PCEs of forest structure 1 and 2, of prey species habitat 2, and of canyon habitat 1, 2, and 3. Upper Mud Springs Canyon and the Blue River are the only restricted habitat on the WBA. The riparian reaches in Mud Springs Canyon also fall within the critical habitat unit on the east side of the Clifton RD. Appendix A: Map 2 contains a map of the MSO critical habitat on the WBA and Appendix A: Map 3 shows adjacent MSO PACs. Riparian areas associated with the Blue River are not within any designated critical habitat unit. Critical habitat on the Wildbunch Allotment provides many of the primary constituent elements, however, it is not extensive and does not strictly meet definitions of MSO habitats in the Recovery Plan.

The Recovery Plan summarizes the effects of grazing to spotted owls in four broad categories: 1) altered prey availability; 2) altered susceptibility to fire; 3) degeneration of riparian plant communities; and 4) impaired ability of plant communities to develop into spotted owl habitat. With respect to prey base, Belsky and Blumenthal (1997) note that livestock grazing can reduce the amount of biomass available to be converted into litter, and therefore increase the proportion of bare ground. The Wildbunch Allotment falls within the Basin and Range-West Recovery Unit for the Mexican Spotted Owl, as identified in the Recovery Plan. For the Basin and Range-West RU, the Recovery Plan notes that grazing primarily affects canyon stringers of pine-oak, mixed conifer, and riparian forests.

The effects of livestock and wild ungulate grazing on the habitat of spotted owl prey species is a complex issue. Impacts can vary according to grazing species, degree of use, including numbers of grazers, grazing intensity, grazing frequency, and timing of grazing, habitat type and structure, and plant or prey species composition. Livestock can affect small mammals directly by trampling burrows, compacting soil, and competing for food, or indirectly by altering the structure or species composition of the vegetation in a manner that influences habitat selection by small mammals. Vegetation cover is often greatly reduced on grazed relative to ungrazed areas, and vegetation typically appears more dense in ungrazed areas. In one study, the total abundance of small mammals differed significantly between grazed and ungrazed plots, with the mean abundance of small mammals per census about 50 percent higher on plots from which livestock were excluded (Hayward et al. 1997). Bock and Bock (1994) reported that small mammal species that prefer habitats with substantial ground cover were more abundant on an ungrazed site, whereas species that prefer open habitats were more abundant on grazed areas in their study area in southern Arizona. Livestock grazing has occurred on this allotment for several decades, and has affected habitat suitability by reducing ground cover used by prey species.

Chiricahua leopard frog

Historically, Chiricahua leopard frogs occurred on the Blue and San Francisco Rivers (Stebbins 2003) and suitable habitat remains, therefore, the Blue and San Francisco rivers are considered occupied habitat (U.S. Fish and Wildlife Service 2003). On the WBA, there are 350 acres of habitat on the Blue River which is excluded from livestock grazing. There is an additional 251
riparian acres within the pastures grazed by livestock of which 44 acres may be protected from livestock grazing in three proposed, but unfunded exclosures. The riparian livestock exclosures proposed for Cienega Creek (Development #12) and Indian Creek (Development #13) would help protect suitable Chiricahua leopard frog habitat. Another proposed, unfunded range development (Development #2) is a well near Cienega Cabin. However, if these unfunded exclosures are not built, frog habitat will be accessible to cattle.

In 1994, Forest Biologist Terry Myers observed what he believed to be Chiricahua leopard frogs in Fritz Canyon (USFS 2006). While this sighting was within the Sandrock allotment, Fritz Canyon is within one mile overland of Mud Springs Canyon. In 2003, the Blue River was surveyed from Triple X Ranch above the WBA to the confluence with the San Francisco River and from there upriver along the southern boundary of the WBA. However, a single survey in such complex systems is not sufficient to ascertain absence. Lowland leopard frogs were the only Rana species found and were only found on the Blue River. In 2003 Clifton District Biologist, Lance Koch, saw an unspecified Rana species at Cienega Cabin trough on the WBA (USFS 2006). In 2004 and 2005, surveys were conducted throughout the WBA, specifically in Mud Springs Canyon, Rock Tank Canyon, Wildbunch Canyon, Cienega Canyon, Johnson Canyon, Indian Creek, Roan Cow Canyon, Oak Springs Canyon, Dry Prong Canyon, the San Francisco and Blue Rivers and in some stock tanks. These surveys only detected Canyon tree frogs (Hyla arenicolor).

There is a Chiricahua leopard frog population south of the WBA, located within three miles of intermittent and perennial stream reaches. This population is in Dix Creek which flows into the San Francisco River less than one-half mile above where Hog Canyon (an unsurveyed tributary on the WBA) flows into the San Francisco River. Hog Canyon is intermittent, with Frisco Bill Spring about one-half mile upstream from the San Francisco River. The riparian reaches of Rock Tank Canyon, Wildbunch Canyon, Mud Springs Canyon, Johnson Canyon, Cienega Creek, Indian Creek and Oak Creek could potentially provide habitat, however, these areas are often heavily impacted by livestock. The WBA therefore contains suitable habitat, but surveys to date have not been able to document frogs on the allotment. However, due to the close proximity of the Dix Creek population, the known migration distance of Chiricahua leopard frogs, and suitable habitat on the Wildbunch Allotment it is reasonably certain to conclude that frogs will occur on the allotment during the life of the action.

**Loach minnow and its critical habitat**

Loach minnow numbers have significantly decreased since the beginning of surveys (1840-1979). Based on surveys from 1994-2005 the Blue and San Francisco reaches within the action area are occupied, but in low numbers and locations are variable between surveys. Though there are no quantitative data on the present loach minnow populations within the Blue and San Francisco. According to the biological assessment, loach minnow populations do not appear to have adequate resiliency to withstand large disturbances such as major floods or fire without being significantly set back (USFS 2006). Direct effects to loach minnow in the Blue and San Francisco rivers have been removed since all livestock grazing of these riparian corridors is not allowed.

There is evidence of the recovery of habitat conditions, but not at a level outlined in the constituent elements of loach minnow critical habitat to ensure adequate perennial flows, and
suitable fines, embeddedness, temperature, quality and complexity of habitat, abundant macroinvertebrate food base, refugia during high flows, and connectivity of occupied habitat.

The desired condition for surface fines (including those contributing to embeddedness) is less than 20% of the surface substrate containing particles sizes of 0.3 inches (8 mm) or less (USFS 2006). The percentage of fines should be less during spawning to swim-up (April through June) and has been recommended to be less than 12 percent in regards to this life stage (U.S. Fish and Wildlife Service 2000a). On the WBA, the percent cover of fines contributing to embeddedness (0.3 inches or less) is between 12 and 35 percent, with three of the ten reaches being below 20 percent. The present survey occurred from late June through early July and, none of the reaches had fines less than 12 percent.

Water temperature measurements have not been continuous, but point-in-time measurements during the course of the survey have occurred. The maximum water temperature recorded was 86°F (30°C) and the maximum variation was 17°F (10°C) on June 30, 2004. These temperatures were taken in mid-morning and mid to late-afternoon and therefore diel variation was likely to be greater than recorded. The desired maximum seven day average temperature is 84°F (29°C) with a diel variation of ≤ 18°F (10°C). Though continuous temperature readings are needed, the survey temperatures appear to be exceeding desired conditions.

The ratio of riffle to pool habitat is somewhat low with pool:riffle ratios being between 0.9 and 1.4 and averaging 1.2. Rosgen C type channels should be close to 1.0 and the sections of B channels are usually riffle dominated. Many of these “slow water” pool areas were likely runs as indicated by their long lengths. However, these runs like the pools have low habitat complexity, with low amounts of canopy cover and variable velocities (shear zones). Point bars are lacking, and of low quality, with few vegetated and stable gravel bars. The present habitat lacks adequate mature and decadent riparian hardwood galleries, large wood, and habitat complexity (USFS 2006).

Lack of habitat complexity, riparian cover, leaf litter production, and stable stream temperatures have also impacted the prey base (macroinvertebrates) for loach minnow. No aquatic macroinvertebrate data are available for these reaches within the action area. Site visits by the Forest Service have identified the presence of mayflies, true flies, black flies, caddisflies, stoneflies, and dragonflies (USFS 2006). However the biological assessment notes that the visual presence of these in vertebrates is often low in number and highly variable throughout the reaches.

Non-native fish and invertebrates (crayfish) are present within the lower Blue River and adjacent San Francisco reaches. They do not appear to be dominant at present, but are significantly impacting native fish populations in the lower San Francisco reaches. Lack of habitat complexity with significant spring runoff has likely given these exotic species a competitive edge (USFS 2006).

Off channel habitat was 0.02% of the total wetted habitat or 0.7 sites/mile, which is very low. Desired condition is two off-channel sites/mile and these sites are considered refugia during high flows. Due to lack of refugia and habitat complexity, the connectivity between local populations is also low.
The Wildbunch Allotment is drained by numerous intermittent and ephemeral streams and washes, and includes perennial and perennial interrupted streams (including Johnson, Cienega, Indian Creeks) and washes that flow directly into the San Francisco and Lower Blue River, which form the western and southern boundaries of the allotment. The streams are characterized as having steep gradients with high energy flows that contribute to relatively unstable streambed conditions. Excessive ungulate use of vegetation within the ephemeral streams can add to the unstable nature of these streams. Areas within Wildbunch, Mud Springs, and Cienega Creeks have vertical and horizontal cutting, with little or no floodplain development, and poor representation of riparian vegetation. These tributaries directly impact conditions on the Blue and San Francisco River which is occupied loach minnow habitat.

Spikedace

Though spikedace have historically occurred throughout the mid-elevations of the Gila River drainages, FWS assumes these species are extirpated from the San Francisco and Blue Rivers (U.S. Fish and Wildlife Service 2003). Recent surveys (1994-2005) with the Blue and San Francisco reaches have not found spikedace although reintroductions could occur during the life of this project. Poor upland watershed conditions, loss of riparian area, and a reduction of riparian complexity in both the tributaries and mainstem Blue River, have resulted in a simplified aquatic habitat. Baseline conditions are equivalent to those described for loach minnow. The present habitat on the tributaries and mainstem Blue River although improving, lack large wood, and habitat complexity. Suitable and historical habitat does not have adequate resiliency to withstand large disturbances such as major floods or fire without being significantly set back from its present condition (USFS 2006). No critical habitat occurs for this species in the action area.

Gila chub

The Fish and Wildlife Service assumes this species is not present within the San Francisco or Blue Rivers and no critical habitat exists in the action area. Recent surveys (1994-2005) with the Blue and San Francisco mainstem reaches have not found Gila chub. Gila chub and its critical habitat are within Harden Ciénega and Dix Creek which are on the opposite side of the San Francisco River from the Wildbunch Allotment outside of the action area. None of the tributaries within the Wildbunch allotment are considered suitable habitat due to steep gradients. Historically, Gila chub likely used the mainstems of the Blue and San Francisco Rivers when their reaches had quality pools with sufficient instream cover (large wood, undercut banks, etc) and a mature/decadent hardwood overstory, especially if a portion of these pools were within backwater areas or sidechannels. Transitory individuals may use the Blue and San Francisco rivers after spring runoff or normal flushing events from summer rains. These mainstem reaches are likely to be important for the expansion or repopulation of adjacent tributaries. Habitat conditions are equivalent to those described for loach minnow and are described above.
B. Factors affecting species environment and critical habitat within the action area

Section 7 consultation on this Allotment was consulted on in the 2003 Blue-San Francisco ongoing grazing opinion. That opinion determined that the proposed action would adversely affect loach minnow, Mexican spotted owls, lesser long-nosed bat, and Chiricahua leopard frog. Incidental take of loach minnow and Chiricahua leopard frogs was anticipated. We provided a number of terms and conditions to minimize incidental take. Conditions on the allotment have not changed dramatically since the 2003 consultation.

Current conditions of the Wildbunch Allotment are as follows:

Vegetation types are summarized in Table 5.

Table 5. Vegetation associations on Wildbunch Allotment (WBA)

<table>
<thead>
<tr>
<th>VEGETATION ASSOCIATION</th>
<th>ACREAGE</th>
<th>PERCENT OF AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Browse</td>
<td>11,424</td>
<td>50%</td>
</tr>
<tr>
<td>Open Pinyon/Juniper Savannah</td>
<td>1,937</td>
<td>8%</td>
</tr>
<tr>
<td>Woodland</td>
<td>3,675</td>
<td>16%</td>
</tr>
<tr>
<td>Juniper Savannah Disclimax</td>
<td>5,441</td>
<td>24%</td>
</tr>
<tr>
<td>Riparian</td>
<td>548</td>
<td>2%</td>
</tr>
<tr>
<td>Ponderosa Pine</td>
<td>30</td>
<td>0.1%</td>
</tr>
<tr>
<td>Private Land</td>
<td>15</td>
<td>0.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23,070</td>
<td>100%</td>
</tr>
</tbody>
</table>

Watershed/Soils

Soil condition is one of the major components of watershed condition. Vegetation is another component and most of the current upland areas on the WBA are in fair range (vegetation) condition (Table 6). However, ground cover is still inadequate over much of the WBA (Table 6). Management objectives for various soil conditions are summarized in Table 7.
Table 6: Range (vegetation) condition rating by pasture.

<table>
<thead>
<tr>
<th>Pasture</th>
<th>% Good</th>
<th>% Fair</th>
<th>% Poor</th>
<th>% Very Poor</th>
<th>% No Capacity</th>
<th>Total Pasture Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>North/Joe Fritz</td>
<td>0%</td>
<td>42%</td>
<td>0%</td>
<td>1%</td>
<td>57%</td>
<td>1402</td>
</tr>
<tr>
<td>South (High Mesa)</td>
<td>1%</td>
<td>31%</td>
<td>15%</td>
<td>5%</td>
<td>48%</td>
<td>5695</td>
</tr>
<tr>
<td>South (Zumwalt)</td>
<td>2%</td>
<td>38%</td>
<td>3%</td>
<td>0%</td>
<td>57%</td>
<td>4065</td>
</tr>
<tr>
<td>Indian/Oak</td>
<td>0%</td>
<td>42%</td>
<td>0%</td>
<td>11%</td>
<td>47%</td>
<td>2,353</td>
</tr>
<tr>
<td>Roan Cow</td>
<td>5%</td>
<td>38%</td>
<td>0%</td>
<td>0%</td>
<td>57%</td>
<td>3534</td>
</tr>
<tr>
<td>Mud Springs</td>
<td>7%</td>
<td>20%</td>
<td>0%</td>
<td>0%</td>
<td>73%</td>
<td>3957</td>
</tr>
<tr>
<td>Little</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>71%</td>
<td>29%</td>
<td>278</td>
</tr>
<tr>
<td>Horse</td>
<td>0%</td>
<td>21%</td>
<td>30%</td>
<td>20%</td>
<td>29%</td>
<td>556</td>
</tr>
</tbody>
</table>

**Traps**

<table>
<thead>
<tr>
<th>Pasture</th>
<th>% Good</th>
<th>% Fair</th>
<th>% Poor</th>
<th>% Very Poor</th>
<th>% No Capacity</th>
<th>Total Pasture Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe Fritz Trap</td>
<td>0%</td>
<td>60%</td>
<td>0%</td>
<td>0%</td>
<td>40%</td>
<td>30</td>
</tr>
<tr>
<td>Sand Rock</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>55%</td>
<td>45%</td>
<td>52</td>
</tr>
<tr>
<td>Weaning</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
<td>69</td>
</tr>
<tr>
<td>Indian Trap</td>
<td>0%</td>
<td>58%</td>
<td>0%</td>
<td>0%</td>
<td>42%</td>
<td>33</td>
</tr>
</tbody>
</table>
Table 7. Management Objectives and Grazing Capability of Different Soil Conditions on the Wildbunch Allotment

<table>
<thead>
<tr>
<th>Grazing Capability</th>
<th>% of WBA (Acres)</th>
<th>Soil Condition Category</th>
<th>Management Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Capacity</td>
<td>36% (8,428)</td>
<td>Satisfactory</td>
<td>Maintain current condition</td>
</tr>
<tr>
<td>Potential Capacity</td>
<td>14% (3,161)</td>
<td>Impaired</td>
<td>Change management to improve or prevent soil loss, e.g., increase soil cover (litter and plants)</td>
</tr>
<tr>
<td>Potential Capacity</td>
<td>6% (1,433)</td>
<td>Unsatisfactory</td>
<td>Change management to improve or prevent soil loss, e.g., increase soil cover (litter and plants)</td>
</tr>
<tr>
<td>No Capacity</td>
<td>44% (10,049)</td>
<td>Untreatable *</td>
<td>Inherently unstable so maximize soil cover (litter and plants)</td>
</tr>
</tbody>
</table>

A total of 20% of the WBA includes impaired soils which have reduced soil function and unsatisfactory soils which have a loss of soil function, i.e., “potential capacity range”.

Riparian/Springs

A number of streams or drainages on or near the WBA were assessed by the Forest Riparian Specialist using “Proper Functioning Condition” (PFC) (U.S. Fish and Wildlife Service 1998). A riparian reach rated as Non Functioning or Functioning at Risk does not meet Forest Plan riparian standards (USDA 1987a) regarding diversity of riparian species and age classes, shade, etc. and is not considered in satisfactory condition. Additionally, even a reach rated at Proper Functioning Condition may, or may not, be in a state to provide suitable terrestrial habitat for some species.
The uppermost and lowermost reaches on Cienega Creek are rated at Proper Functioning Condition. The two intermediate reaches are respectively rated as Non Functioning and Functioning at Risk. The entire riparian segment of Mud Springs Canyon is rated as Non Functioning. Most reaches of Wildbunch Canyon are rated as Non Functioning, although the uppermost reach was rated at Proper Functioning Condition. The lowermost and uppermost reaches of Wildbunch Canyon are rated at PFC, while one reach in between is Non Functioning and the other is Functioning at Risk.

Some of the range improvements noted above would exclude livestock from water sources such as springs and stretches of intermittent flows. The table below (Table 8) shows the drainages that may include some livestock exclusion fencing. Except for the Blue River, these drainages are not known to contain loach minnow, spikedace, Gila chub, or Chiricahua leopard frog. Approximately 34% of the riparian acres on the allotment will not be protected from livestock grazing.

Table 8. Total riparian areas with acreage, and acreage that may be fenced under the Proposed Action. Most are not currently fenced i.e., excluded, from livestock, and currently no funding exists to fence them.

<table>
<thead>
<tr>
<th>Drainage</th>
<th>Total Riparian Acres</th>
<th>Acres of Riparian within Exclosures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fritz</td>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>Wildbunch</td>
<td>43</td>
<td>0</td>
</tr>
<tr>
<td>Mud Springs</td>
<td>48</td>
<td>0</td>
</tr>
<tr>
<td>Cienega</td>
<td>47</td>
<td>24</td>
</tr>
<tr>
<td>Johnson</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Hog</td>
<td>35</td>
<td>0</td>
</tr>
<tr>
<td>Indian</td>
<td>47</td>
<td>7</td>
</tr>
<tr>
<td>Blue River</td>
<td>350</td>
<td>297</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>601</strong></td>
<td><strong>341</strong></td>
</tr>
</tbody>
</table>

* Riparian acres are delineated from the DFC definition of riparian. See map and definitions of each type of drainage classification in the project record.
* Cienega Creek exclosure is proposed to be split into two sections to allow cattle to cross the creek and avoid being trapped in the northwest corner of Roan Cow pasture.
* Johnson Canyon has been recently fenced to exclude cattle.
* There is no increase in AUMs for this fenced exclosure, thus there may be little incentive to construct it.
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.

Mexican spotted owl

Potential nesting, roosting, and foraging MSO habitat exists on the Wildbunch Allotment. The Recovery Plan notes that restricted habitat provisions were made because it is recognized that owls may occur in areas other than protected habitat. Guidelines for riparian habitat, which falls within the restricted category, were developed to maintain healthy riparian ecosystems where they exist and to initiate restoration measures to return degraded areas to healthy conditions. On the Wildbunch there are approximately 600 acres of restricted habitat of which 250 are accessible to cattle grazing (the Blue River is not grazed by livestock).

Belsky and Blumenthal (1997) note that grazing can lead to compacted soils, which results in increased runoff and decreased water storage; and can also lead to increased erosion and runoff due to reduced plant cover and compacted soils. Both of these factors, which lead to the degeneration of riparian plant communities and impair the ability of plant communities to develop into spotted owl habitat, are expected to continue during the life of the project.

The potential MSO habitat in upper Mud Springs Canyon would be grazed by livestock during year 2 of the rotation schedule from June through September which coincides with the MSO breeding season (March through August). Activities associated with livestock management such as gathering and herding would have the potential to disturb individual MSOs, if present (USDI 1995a). The proposed trail (Dev. #11) would be located in the ponderosa pine and Gambel oak stands on the north side of Coalson Peak. This trail would be available to the public but recreational use on the WBA is essentially limited to fall season hunting, and that level is low. Transport of a water storage tank to upper Morris Springs (Dev. #3), near the pine-oak stands would be accomplished by helicopter. The drift fence within Mud Springs Canyon (Dev. #14) would help with livestock distribution and would be installed by hand; however materials may be flown in by helicopter as well. Additional fencing materials may be flown into Zumwalt Pasture as well. Installation of all of these range developments would have the potential to disturb MSO, if present, and if construction occurs during breeding season.

Indirect effects to MSO from livestock may impact soil and plants that provide habitat for MSOs prey species. Current conditions in riparian areas are unsatisfactory by ASNF’s definition because of a lack canopy and lack of riparian woody age classes for subsequent recruitment into mature age classes (USFS 2006). Removal of livestock from a pasture or at least the riparian areas within a pasture based on reaching the seasonal use utilization standard in these critical areas would help assure plant physiological needs are met each year and that any subsequent regrowth that might occur (which is temperature and moisture dependent) would go toward plant
recovery and movement toward desired future conditions (USDA 2006, Appendix C). Livestock moves from a pasture based on seasonal use in critical riparian areas along with extended periods of non-use in Mud Springs Pasture (12 to 15 months) would help to provide more riparian residual herbaceous and shrub cover for prey forage and cover needs than currently present. It is not expected that riparian recovery would be complete in grazed riparian areas (USFS 2006) although an upward trend may occur.

Chiricahua leopard frog

The Chiricahua Leopard Frog Recovery Plan (U.S. Fish and Wildlife Service 2007a) provides a lengthy discussion of potential effects to CLF from livestock grazing activities with emphasis on affects to CLF during the warmer periods of the year when the species is assumed to be surface-active and/or reproductive. Livestock are adapted to mesic habitats and select riparian habitats for water, shade, and cooler temperatures. They spend a disproportionate amount of their time in riparian zones and can adversely affect these systems in a number of important ways (see Fleischner 1994, Belsky et al. 1999, Jones 2000, and references therein).

Both direct and indirect adverse effects may occur through a variety of means during the non-active seasons of the year for CLFs, which include trampling of hibernating frogs or tadpoles; erosion and/or siltation of stream courses; elimination of undercut banks that provide cover for frogs; loss of wetland and riparian vegetation and backwater pools; and spread of disease and non-native predators (Arizona State University 1979, Hendrickson and Minckley 1984, Ohmart 1995, Jancovich et al. 1997, Belsky et al. 1999, Ross et al. 1999, U.S. Fish and Wildlife Service 2000b, Sredl and Jennings 2005). Increased watershed erosion caused by grazing can accelerate sedimentation of deep pools used by frogs (Gunderson 1968). The indirect effects of grazing in the WBA on Chiricahua leopard frog habitat may also include increases in sedimentation generated by grazing levels. Sediment can alter primary productivity and fill interstitial spaces in streambed materials with fine particulates that impede water flow, reduce oxygen levels, and restrict waste removal (Chapman 1988).

Trampling of Chiricahua leopard frogs by cattle has not been documented; however, it likely occurs. Juvenile and adult frogs can probably often avoid trampling when they are active; however, leopard frogs are known to hibernate on the bottom of ponds (Harding 1997), where they may be subject to trampling during the winter months. We are reasonably certain that increased risks of trampling hibernating or surface-active frogs, carry-over tadpoles from last year which have not yet metamorphosed, or egg masses may occur at sites which may become occupied by CLF due to dispersal from nearby sites during the life of the project. Frogs are known to inhabit the action area and are within dispersal distance of this Allotment. There are 251 riparian acres on the Allotment of which only 44 acres may be protected from livestock grazing in the proposed action. According to the biological assessment many of the riparian reaches on the WBA could potentially provide habitat for the Chiricahua leopard frog. With respect to the effects of the action on the frog, we believe there is a potential for impacts to frogs during tank maintenance activities such as dredging or silt removal; injury at tanks due to transmission of disease by cattle or ranch hands; and direct or indirect mortality at those tanks grazed by livestock as a result of cattle wading into stock tanks, removing shoreline or aquatic cover at egg deposition sites, and increasing turbidity. With respect to riverine habitats, cattle grazing has been precluded along the mainstem Blue River. Therefore, the removal of shoreline vegetation or aquatic cover at egg deposition sites, increasing turbidity, grazing levels, and
trampling are of concern along other areas including Rock Tank Canyon, Wildbunch Canyon, Mud Springs Canyon, portions of Johnson Canyon, Cienega Creek, Indian Creek, and Oak Creek.

**Spikadace**

As previously noted, spikadace have never been documented in the San Francisco or Blue rivers or their tributaries in Arizona. However, early sampling of fish in the area was almost nonexistent. It is likely that several native species, including spikadace, were extirpated from the entire San Francisco River basin since the 1960s. Any activities, including the proposed action which maintains current aquatic conditions will limit suitability for spikadace. However, since the species is not reasonably certain to occur in the action area there are no anticipated effects to spikadace.

**Loach minnow and its critical habitat**

Livestock will be herded across the Blue River during emergency situations when trucking is not practical or safe (i.e. inclement weather and poor road conditions). Herding will only occur on an as-needed basis. Loach minnow may be directly effected from herding across the Blue River. Effects may include direct and indirect effects to loach minnow and their habitat.

The effects of cattle wading in stream courses can be of particular concern in the streams where loach minnow could be found. This is especially true in smaller systems. We have not documented livestock trampling fish and/or fish eggs in streams that loach minnow inhabit, although impacts of livestock are expected to disturb, dislocate, or otherwise negatively affect fish or fish eggs as well as PCEs 1 and 2. Adverse effects to loach minnow will be infrequent and are expected to be small.

Crossing the Blue River has the potential to directly impact riparian conditions at the crossing and downstream; potentially degrading loach minnow habitat. Cattle presence on streambanks destabilizes them through chiseling, sloughing, compaction, and collapse, and results in wider and shallower stream channels (Platts and Nelson 1985, Platts 1990, Meehan 1991). This may change the way in which flood flows interact with the stream channel and may exacerbate flood damage to banks, channel bottoms, and riparian vegetation. These impacts occur at all levels of cattle presence, but increase as the number of livestock and the length of the grazing season increase (Marlow and Pogacnjik 1985). These effects will be limited to short time-frames and will not occur yearly. The crossing will only be used in emergency situations and will require prior approval before it is used.

In addition to the effects from direct access to the Blue River, loach minnow may be impacted by grazing within the watershed. If the watershed and riparian conditions of the allotment (project area) were properly functioning and had the resiliency to recover from large disturbances, there would likely be no measurable indirect effects to the species or critical habitat from the proposed action. However, short-term impacts (5 years or less) from proposed livestock grazing are not insignificant or discountable. Improved management of this allotment could lead to a reduction of the negative effects in the future.
Indirect effects to the species will occur in the watershed from those affects that cause an increase in sediment to the stream network, reduction in riparian recovery, and alteration of the natural hydrologic flow regime. Livestock have access to tributary riparian areas where they may compact soils, remove ground cover and herbaceous vegetation, and browse on riparian woody species. This can be significant if livestock are concentrated in localized areas, remain too long in these areas, or are present during vulnerable times of the growing season. This will also be true in regards to livestock use in unstable or poor condition uplands. There also is a concern of the success of effectively monitoring and moving large numbers of livestock (246 cow/calves, plus 8 horses intermittently) in short periods of time during poor conditions (such as drought) and in rugged terrain. This proposed action adds two additional pastures (moves) compared to baseline. The evidence of soil loss associated with livestock grazing infers that this erosion has been transported by wind and water and that portion that was transferred by water will move through the drainage network at a rate greater than what the drainage receives from natural processes.

The effects of grazing in the upland do not stop at the allotment’s interface with the river, or at the downstream end of the allotment. Excessive amounts of sediment, as generated through degraded conditions or removal of protective vegetation, may have deleterious effects not only in the immediate area, but in areas downstream because sediment generated on one allotment may travel substantial distances downstream. Meehan (1991) notes that “Generally, in grazed areas, stream channels contain more fine sediment...” Once entrained in the river, the erosion and deposition of sediment affect the channel’s shape, size, and properties. Sediment that enters the stream does not immediately settle out, but instead the motion of flow constantly stirs up the water, with sediment particles carried along by the water rather than settling out. Leopold (1997) notes that “…the channel is adjusted in width, depth, and slope to handle the sediment that is received from the upstream river system.” Loach minnow require specific channel conditions for suitable habitat, as outlined in the constituent elements of the final rule designating critical habitat (U.S. Fish and Wildlife Service 2000a). Changes in the slope affect the velocity of water, which may eliminate the runs and riffles necessary for loach minnow habitat. Changes in width and depth may affect water temperatures.

Utilization rates are expressed in two ways in the Environmental Assessment, 1) seasonal use, and 2) end of season utilization. The primary concern is that there is enough ground cover remaining after the pasture has been grazed to ensure that sediment does not enter the stream system. It is important to have adequate cover both prior to the monsoon and winter snow melt. Therefore, we recommend that the Forest measure seasonal or mid-season use and stay consistent with the measurement of utilization on the allotment through the life of the permit.

Both unsatisfactory and impaired soil conditions will continue to impact the species and its habitat. The proposed action is for ten years, and could potentially allow 246 cow/calf units to graze at varying utilization rates between 25 and 45 percent. Impacts of the proposed action are exacerbated by the existing baseline conditions on the Allotment. Utilization rates on upland portions of the Allotment have been high in areas, with a compliance inspection report finding utilization rates on herbaceous plants at >50 percent along Cienega Creek, and at 35 to 60 percent along drainage bottoms in Oak Springs Canyon within the Roan Cow Pasture (U.S. Fish and Wildlife Service 2005). A total of 20 percent of the Wildbunch Allotment includes impaired soils which have reduced soil function and unsatisfactory soils which have a loss of soil function.
Livestock grazing within this allotment will continue to contribute to the present habitat conditions related to perennial flow, fines, and water temperature inputs from the tributaries of the project area to the Blue and San Francisco Rivers. These contributions (along with other actions within the watershed) will likely reduce the conservation role of critical habitat within the Blue River related to the constituent elements discussed.

**Gila chub**

As previously noted, Gila chub are not located in any tributaries of the Wildbunch Allotment. They are found within Harden Cienega and Dix Creek which are on the opposite side of the San Francisco River of the Wildbunch Allotment, outside of the action area. There will be no direct effects from the proposed action on these populations. Indirect effects to the Blue and San Francisco rivers are described above and could effect any transient Gila chub in these rivers, but the fish are not likely in to remain in these areas.

**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.

Since the land within the action area is managed by the Apache-Sitgreaves National Forest, most activities that could potentially affect listed species are Federal activities and subject to additional section 7 consultation.

**CONCLUSION**

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.

**Mexican Spotted Owl**

After reviewing the current status of the Mexican spotted owl, the environmental baseline for the action area, and the anticipated effects of proposed continued livestock grazing activities, it is our biological opinion that the action as proposed would not jeopardize the continued existence of this species and is not likely to destroy or adversely modify designated critical habitat for the Mexican spotted owl for the following reasons:

- Mexican spotted owls occur over a five-state area in the United States, as well as in portions of Mexico. There is concern that Mexican spotted owl numbers may be continuing to decline. The proposed action may affect a small number of owls, and a small portion of their total range;

- The implementation of the proposed action is not expected to impede the conservation value of critical habitat within the Basin and Range-West Recovery Unit.
Chiricahua Leopard Frog

After reviewing the current status of the CLF, the environmental baseline for the action area, the effects of the proposed livestock grazing and the potential for cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the CLF. No critical habitat has been designated for this species; therefore, none will be affected. We present this conclusion on the CLF for the following reasons:

- Improved overall dispersal of livestock is anticipated to reduce heavy livestock use at stock ponds and/or tanks;
- The ecological condition of the area should be maintained or improved during the 10-year life of the AMP;
- This allotment is not within any management unit identified in the species’ draft recovery plan for CLF management emphasis.

Loach minnow

After reviewing the current status of the loach minnow, the environmental baseline for the action area, the effects of the proposed livestock grazing on the Wildbunch Allotment, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the species or destroy or adversely modify its critical habitat for the following reason:

- Livestock grazing effects on loach minnow and its habitats on the allotment will be further reduced by reductions in cattle numbers, season of use, and fencing of important areas.
- Reduced stocking rates and overall redistribution of livestock is anticipated to reduce effects of livestock use.

Spikedace

After reviewing the current status of the spikedace, the environmental baseline for the action area, the effects of the proposed livestock grazing and the potential for cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the spikedace. Critical habitat does not occur within the action area. We present this conclusion because the species is extremely unlikely to occur within the action area of this proposed project.

Gila chub

After reviewing the current status of the Gila chub, the environmental baseline for the action area, the effects of the proposed livestock grazing and the potential for cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence
of the Gila chub. Critical habitat has been designated for this species, but does not occur within the action area. We present this conclusion for the following reasons:

- Recent surveys have not documented Gila chub within the Blue or San Francisco rivers.
- Numbers of Gila chub are likely very small representing transient individuals in the system.
- None of the tributaries within the Wildbunch Allotment are considered suitable habitat due to steep gradients.

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. Currently the Forest does not have the funds to complete all of the range improvements. Therefore, effects to species are analyzed as though range improvements may or may not occur during the life of the proposed project.

**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 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.

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 (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 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

**Mexican spotted owl**

Because no surveys have been completed for Mexican spotted owls on the Wildbunch allotments, the exact number of owls potentially inhabiting these areas is unknown. We believe the presence of approximately 600 acres of restricted habitat and the presence of one PAC five miles away from the proposed action area are strong evidence that owls are likely to occur within the action area. Although the project does not meet the guidance of the Recovery plan, we are not able to conclude with reasonable certainty where owls are present and how they might be incidentally taken.

**Chiricahua leopard frog**

Available information on CLFs on the allotments meets the guidance set in the grazing guidance criteria which would allow us to conclude the species is likely to be present in un-surveyed, suitable habitat. According to the 2004 grazing guidance criteria, habitat, likely to be occupied by the CLF includes: 1) currently suitable habitat where the frog has been documented within the last 5 years, but is apparently now absent or 2) suitable habitat that is (a) within 1 mile overland of occupied habitat, (b) within 3 miles along an ephemeral or intermittent drainage from occupied habitat, or (c) within 5 miles along a perennial stream from occupied habitat. Suitable/potential habitat on this allotment has been surveyed but also occurs within known dispersal distance of the Chiricahua leopard frog. Generally, there are no restrictions for cattle use in riparian areas that may be “likely to be occupied” other than utilization limits. There are several unsurveyed suitable/potential perennial or intermittent streams, springs, and stock tanks on this allotment.

We anticipate that indirect take (harm and/or harassment) associated with temporary increases in sedimentation, loss of vegetation in suitable habitat, inadvertent transmission of disease, and direct take (kill or harm) of Chiricahua leopard frogs will occur at a level that will result in no more than 1 dead or dying frog or disturbed eggmass being observed on the Wildbunch Allotment. Incidental take anticipated is 1 dead or dying frog or disturbed eggmass after cattle have been moved into or occupy a pasture, and this direct impact can be clearly attributable to livestock activity (trampling, bedding) in suitable habitat.

**Spikedace**

The FWS does not anticipate that the proposed action will incidentally take any spikedace, as they have been extirpated from the Blue and San Francisco rivers for approximately 40 years. If spikedace are reintroduced during the life of the project, this will constitute new information and this biological opinion will need to be updated.

**Loach minnow**

We anticipate that take will occur due to the indirect effects of grazing and the subsequent adverse effects to the riverine habitat in which loach minnow live. This take will be in the form of harm, in that habitat will continue to be modified or degraded in such a way as to result in death or injury by significantly impairing essential behavioral patterns such as breeding, feeding,
and sheltering. The FWS anticipates incidental take of loach minnow will be difficult to detect for the following reasons: (1) due to the inherent biological characteristics of aquatic species, the likelihood of discovering an individual death or other taking attributable to grazing is small; the small body size, behavioral modification before death, presence of aquatic vegetation, stream flow, and rapid rates of decomposition make finding an incidentally taken individual fish extremely unlikely; effects of the proposed management such as allotment management plans are largely unquantifiable in the short term, and may only be measurable as long-term effects on the species habitat or population levels; and the best scientific and commercial data available are not sufficient to estimate a specific amount of incidental take of the species themselves. Therefore, the FWS defines incidental take in terms of habitat conditions, and uses surrogate measures to identify when take has been exceeded. We anticipate that take will occur throughout those portions of the Blue and San Francisco rivers and their tributaries included within the action area. The anticipated level of incidental take of loach minnow from the proposed action will be exceeded if any of the following conditions occur:

- Cattle access the Blue River corridor outside of the permitted special use crossing situations and are not immediately removed, and the result is additional adverse effects not anticipated in this document. Additionally, if the crossing is used more than five times during the life of the permit, the effects will need to be re-analyzed.

Or

- Forage utilization objectives are exceeded AND if there is an accompanying documented loss of ground cover (basal area, litter), AND if upland channel instability occurs.

**Gila chub**

The FWS does not anticipate the proposed action will incidentally take any Gila chub. We conclude this for the following reasons:

1. No tributaries within the Wildbunch Allotment are considered suitable habitat due to steep gradient.

2. Surveys have never documented Gila chub within the Blue or San Francisco rivers.

3. We cannot be reasonably certain that the level of impacts will reduce the availability of habitat for any life stages of Gila chub that may use the area as a corridor to another more suitable site.

**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

Chiricahua Leopard Frog

The following reasonable and prudent measures are necessary and terms and conditions are appropriate to minimize the effects of the take of Chiricahua leopard frogs for the Wildbunch Allotment.

1. The Forest shall take steps necessary to minimize take associated with maintenance of stock tanks and grazing of occupied habitat not currently excluded from livestock grazing and report activities to this office.

The following term and condition implements reasonable and prudent measure number 1:

- Since occupancy of suitable habitats by Chiricahua leopard frogs is dynamic species abundance and presence/absence may vary at different sites from year to year. The Forest Service shall survey to protocol for quality of habitat and verify the presence of frogs in those areas of historical or present occupation and areas with suitable habitat on a rotating basis. Protected wetlands within the allotment should be surveyed every three years. If frogs are documented, then a complete survey should occur within three years.

- Where Chiricahua leopard frogs are found, the Forest Service shall coordinate with the AESO to develop and implement a site specific plan that may include: 1) forego maintenance; 2) salvage; 3) limit disturbance and work areas to the minimum practicable (i.e., leave stands of emergent vegetation in place, implement measures to minimize the likelihood of disease transmission); or 4) fence portions of the occupied pond or tank (portions may be left unfenced to allow some access by cattle). If frogs are salvaged, the Forest Service shall coordinate with appropriate parties (e.g. AGFD) and a qualified institution to be used for the temporary holding of the frogs. Spring associated tanks or ponds will be given emphasis for protection.

- Survey data will be provided to the AESO within 90 days of collection.

2. Personnel education programs and well-defined operational procedures shall be implemented to minimize the contamination of occupied Chiricahua leopard frog habitat by non-native species of the chytrid fungus.

The following terms and conditions are necessary to implement reasonable and prudent measure 2:

- Live fish, crayfish, bullfrogs, leopard frogs, salamanders, or other aquatic organisms shall not be moved among livestock tanks or other aquatic sites.

- Where new or existing sites occupied by Chiricahua leopard frogs occur, water shall not be hauled to the site from another aquatic site or tank that supports leopard frogs, bullfrogs, crayfish, or fish.
Where sites occupied by Chiricahua leopard frogs exist within the proposed action area, the Permittees shall be required to clean any equipment, boots, etc. used at an aquatic site with a 10 percent bleach solution, or allow such equipment, boots, etc. to dry thoroughly, before using the same equipment, boots, etc. at another aquatic site.

All ranch hands, construction personnel, and others implementing the proposed action shall be given a copy of these term and conditions, and informed of the purpose and need to comply with them.

**Loach minnow**

The following reasonable and prudent measures and terms and conditions are necessary and appropriate to minimize the effects of take of loach minnow.

1. The Forest Service shall reduce take of loach minnow associated with the proposed action, by protecting occupied habitat.

The following term and condition is necessary to implement reasonable and prudent measure 1.

- If utilization rates are exceeded and ground cover decreases or channel stability decreases, then cattle will be removed from the affected area and the AESO will be contacted within 10 working days. The AESO will coordinate with the ASNF to determine if the information provided constitutes new information requiring reinitiation of formal consultation.

2. The Forest Service shall conduct monitoring of the incidental take associated with this proposed action and report the finding to this office.

The following terms and conditions are necessary to implement reasonable and prudent measure 2.

- Using standard approved Forest Service methodologies, the Forest Service shall complete the necessary measurement of utilization rates, ground cover, and channel stability during the same time period to determine that utilization rates are not exceeded, ground cover is maintained or increased, and channel stability is maintained or increased. Utilization, ground cover, and channel stability will be measured at cattle entry and exit of each pasture.

- Representative sites for ground cover and channel stability measurements will be determined following a field review. For ground cover sites, the emphasis will be on slopes leading to drainage channels. For channel stability sites, the emphasis will be on sites within or adjacent to the grazing activity. Sites selected and procedures to be used will be coordinated with the AESO.

- Within 120 days of the finalization of this Biological Opinion, the Forest Service shall provide written documentation to notify the AESO of the methodologies that will be applied in accomplishing this reasonable and prudent
measure. The methodology will include methods to obtain utilization, timing of monitoring, and areas that will be monitored.

- In the annual report described in the general terms and conditions in this biological opinion amendment, the Forest Service shall briefly summarize for the previous calendar year; 1) implementation and effectiveness of the terms and conditions, 2) documentation of take, if any, and 3) actual livestock use (head, animal months, dates of pasture use, utilization measurements, etc) with a description of any variations from the proposed action. If other monitoring or research is completed concerning loach minnow or conditions of rangeland, riparian areas, or soil, a copy of the relevant reports shall be made available.

3. Protect riverine and riparian habitat from significant grazing and effects from crossing the Blue River.

The following terms and conditions are necessary to implement reasonable and prudent measure 3.

- Appropriate management actions shall be taken to ensure that cattle are not congregating within stream corridors.

- Ensure allotment and pasture fences are maintained to ensure that trespass cattle are not using these areas. If the fences are found to have been damaged they shall be immediately repaired. If any livestock are found within occupied loach minnow habitat where they are not authorized to graze, they will be immediately removed.

- The Forest Service shall closely monitor utilization and physical damage levels to banks and existing vegetation within the Blue River during periods of cattle crossing at FR 475.

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 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.

Disposition of Dead or Injured Listed Species

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. Implement the spikedace and loach minnow survey protocol developed by ASU to obtain regular survey data on spikedace and loach minnow within Campbell Blue Creek and the Blue and San Francisco rivers.

2. Develop a long-term plan to determine how consistent, repeated survey efforts can be accomplished for spikedace and loach minnow and their habitat in the Blue and San Francisco rivers.

3. Develop a monitoring program for all the allotments on the Clifton Ranger District to determine the effects of grazing reductions for use in future project planning and consultation.

4. Develop a strategy to regularly survey for suitable habitat and to survey existing suitable habitat for Chiricahua leopard frogs.

5. Conduct surveys for the Mexican spotted owls throughout suitable habitat in the action area.

6. Conduct studies of spotted owl prey base species to determine their habitat requirements and how these requirements are affected by grazing.

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 Wildlbutch Allotment Management Plan 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 (x213) or Debra Bills (x239). Please refer to the consultation number, 22410-01-F-0211R1, in future correspondence concerning this project.

Sincerely,

/s/Debra Bills for
Steven L. Spangle
Field Supervisor

cc: District Ranger, Clifton Ranger District, Springerville, AZ
    Shaula Hedwall, Fish and Wildlife Service, Flagstaff, AZ
    Chief Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ


Jennings, R.D. 1995. Investigations of recently viable leopard frog populations in New Mexico: *Rana chiricahuensis* and *Rana yavapaiensis*. New Mexico Game and Fish Department, Santa Fe.


Mr. Deryl Jevons


Appendix A: Maps

Map 1. Map of the Wildbunch Allotment along with proposed range developments.
Map 2. Mexican Spotted Owl Protected Activity Centers on the Clifton Ranger District in relation to the Wildbunch Allotment.
Map 3. Mexican Spotted Owl Critical Habitat on the Wildbunch allotment.