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AESO/ES
2-21-96-F-160

Memorandum

To: State Director, Bureau of Land Management, Phoenix, Arizona

From: Field Supervisor

Subject: Amendment Number 4: Programmatic Biological Opinion for the Safford/Tucson Field Offices' Livestock Grazing Program, Southeastern Arizona

This memorandum is in response to your December 3, 1998, request for reinitiation of formal consultation on the Safford/Tucson Field Offices' livestock grazing program, southeastern Arizona. This memorandum also responds to your February 22, 1999, memo requesting conferencing on the effects of livestock grazing to critical habitat proposed (and since finalized) for the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*), a March 10, 2000, memo requesting changes in the proposed action in regard to the Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*), a request in the Bureau of Land Management's (Bureau's) March 2000 annual report to modify Table 7 of the biological opinion in regard to the proposed action and the Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*), and a verbal request from Ted Cordery of your staff to evaluate the effects of the action on critical habitat designated in 1999 for the water umbel.

In a September 26, 1997, biological opinion the Fish and Wildlife Service evaluated effects of proposed grazing activities on Kearney's blue star (*Amsonia kearneyana*), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), Nichol's turk's head cactus (*Echinocactus horizonthalonius* var. *nicholii*), Arizona hedgehog cactus, Huachuca water umbel, desert pupfish (*Cyprinodon macularis*), spikedace (*Meda fulgida*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), loach minnow (*Tiaroga cobitis*), razorback sucker (*Xyrauchen texanus*), southwestern willow flycatcher (*Empidonax traillii extimus*), cactus ferruginous pygmy-owl; lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*), jaguar (*Panthera onca*), and New Mexico ridgenose rattlesnake (*Crotalus willardi obscurus*), and critical habitat designated for the southwestern willow flycatcher and razorback sucker. The Service's biological opinion concluded that implementation of the project is not likely to jeopardize the continued existence of these species nor result in destruction or adverse modification of critical habitat. Incidental take statements were included for all animal species. The opinion also included concurrences on Bureau determinations of "may affect, not likely to adversely affect" for eight additional species. The biological opinion has been previously amended three times. In a November 3, 1998,

memorandum from this office to the Bureau's Safford Field Office Manager, modifications to the Proposed action were made in regard to operation of the Harper and Guthrie allotments (amendment No. 1). In a November 16, 1998, memorandum from this office to the State Director, the opinion was amended by replacing term and condition 1.b for the pygmy-owl, which called for removal of grazing on 10 allotments, with a term and condition that required that utilization rates not exceed 30 percent in suitable pygmy-owl habitat on five allotments, at least until completion of a study described in (c)(3) of the mitigation measures in the opinion (pages 62-63) (amendment No. 2). In a November 17, 1998, memorandum from the Service's Regional Director in Albuquerque, to the Bureau's Arizona State Director, the effective date of terms and conditions that required removal of cattle from riparian areas and management of trailing in riparian areas to minimize take of the cactus ferruginous pygmy-owl and razorback sucker was delayed until a reinitiation of consultation on these species could be completed, or until May 1, 1999, whichever ever occurred first (amendment No. 3).

Aspects of the biological opinion were challenged in Arizona District Court (Arizona Cattle Growers Assoc. and Jeff Menges vs. U.S. Fish and Wildlife Service and Bureau of Land Management). In a December 8, 1998, ruling, Judge David Alan Ezra granted the plaintiffs' motion for partial summary judgement. This had the effect of invalidating the incidental take statements for the razorback sucker and cactus ferruginous pygmy-owl. Judge Ezra found that the Service had failed to provide sufficient evidence that the two species existed in the allotments in question; and thus we had failed to show that take was reasonably likely to occur.

The Bureau proposes changes to the Safford/Tucson grazing action in light of the court's ruling. New information is also available on the cactus ferruginous pygmy-owl (including designation of critical habitat) and razorback sucker. These changes and new information warrant reinitiation of consultation pursuant to 50 CFR 402.16(b, c, and d). Herein we amend the "Description of the Proposed Action"; "Environmental Baseline", "Effects of the Proposed Action", "Conclusions", "Incidental Take Statements", and "Conservation Recommendations" for the cactus ferruginous pygmy-owl and razorback sucker. We also amend the "Description of the Proposed Action", "Effects of the Proposed Action", and "Conclusion" for the Huachuca water umbel; and the "Description of the Proposed Action" and "Effects of the Proposed Action" for the Arizona hedgehog cactus. All other aspects of the biological opinion, as amended previously, remain the same.

CACTUS FERRUGINOUS PYGMY-OWL AND RAZORBACK SUCKER

Changes to the Proposed Action

The Bureau, in memoranda dated December 3, 1998, February 22, 1999, April 8, 1999, and April 27, 1999, and in a March 2000 verbal request from Ted Cordery of your staff, proposed changes to the grazing activities that were the subject of the September 26, 1997, biological opinion. Additional modifications of the proposed action were agreed to at meetings between Service and Bureau staff. These modifications are as follows:

1. On the Smuggler Peak allotment, immediately upstream of the Gila Box RNCA, the permittee, Jeff Menges, and the Bureau have agreed to develop a winter riparian pasture on the Gila and San Francisco rivers. This grazing strategy would consist of winter grazing (November to April) in the riverbottoms by up to 30-50 head of cattle. Gates would be opened after the first hard freeze, allowing cattle to move into the riverbottom. When the trees begin to bud out in the spring, cattle would be gathered and moved to the uplands. Fences need to be completed and upland waters constructed to implement this pasture system. Developments are expected to be in place by spring 2000.

2. The Bureau proposes to survey for pygmy-owls in suitable riparian habitat on the Gila and San Francisco rivers in the Smuggler Peak allotment using the current approved Service survey protocol during 2000-2001 and again in 2004-2005. If pygmy-owls are detected in the river corridors, the Bureau would reinstate consultation on the effects of cattle grazing in the riparian pasture of the Smuggler Peak allotment.

3. The Bureau proposes two new objectives and other changes in grazing management on Bureau lands below 4,000 feet in the upper and middle Sonoran Desert Major Land Resource Area (MLRAs 40-1 and 40-2) that are suitable pygmy-owl habitat or habitats that have the site potential (capability) to support suitable habitats with changes in management; and in drainages below 4,000 feet in Southern Arizona Semidesert Grassland MLRA 41-3A2 mapped by Natural Resources Conservation Service on their 1:24,000 scale soil maps. Objectives for these potential and suitable habitats would be as follows: 1) attain sufficient long-term recruitment of cavity trees and saguaros, and 2) achieve or maintain even structural diversity of shrubs, trees, and herbaceous plants. Also, if livestock grazing is causing a suitable site to become unsuitable as habitat for the pygmy-owl, changes in management would be implemented prior to the next grazing year to ensure habitats are maintained. Changes in management needed to ensure habitat maintenance and/or to meet the two objectives are discussed in more detail below, but could include eliminating base herds, eliminating grazing, limiting utilization to 30 percent in upland areas, or other appropriate management changes. Where utilization is limited to 30 percent on Bureau lands, if that limit is reached in a key area, grazing would be terminated in that pasture or on the allotment, whichever is applicable. One or more of these management regimes are proposed for six allotments in the northwest Tucson area. Changes in other allotments would be made if the objectives are not met or suitable habitats are becoming unsuitable as a result of livestock grazing. In allotments other than the six allotments addressed in 4, below, the Bureau would reinstate consultation where nesting pairs of pygmy-owls are detected through approved surveys conducted to standard protocols within three miles of Bureau lands, and the Bureau determines there is an adverse effect to the pygmy-owl. In all suitable pygmy-owl habitats, where ephemeral extensions would be authorized after March 1, such extensions would occur in 30-day increments to allow accurate assessments of utilization and when ephemeral extensions should be terminated.

4. The Bureau proposes specific management to implement the two management

objectives in item 3 on suitable and potentially suitable habitat on six allotments in the northwest Tucson area. Utilization would be limited to 30 percent in good pygmy-owl habitat (factored score of 25 or more) on Bureau lands in the Claflin, Cross Triangle, and Guild Wash allotments. Ephemeral extensions authorized after March 1 would be limited to 30-day increments. After consulting with the permittees, the Bureau may devise alternate grazing strategies for these three allotments to reduce impacts to pygmy-owls and their habitats. (The Bureau should reinitiate consultation if these alternate strategies trigger reinitiation criteria as described in 50 CFR 402.16.) In the Newman Peak allotment, the 670 acres of Bureau-administered lands will be fenced to exclude livestock. In the interim, before the fence is completed, the permittee will herd cattle off the Bureau lands. In the Balcom allotment, the Bureau proposes to cancel the base herd and allow only ephemeral use on 3,289 acres of Bureau lands in the North Star pasture. In the remaining 439 acres of Bureau lands outside the North Star pasture, a base herd of four cattle and ephemeral grazing would be authorized. On the Owl Head allotment, the Bureau proposes to cancel the base herd and allow only ephemeral grazing on 10,240 acres of the Desert Pasture. The remaining 1,840 acres of Bureau lands outside the Desert Pasture would have a base herd of 14 cattle and ephemeral grazing would be authorized. All ephemeral grazing would be authorized in 30-day extensions after March 1.

5. The Bureau is committed to implementing the Gila Box Riparian National Conservation Area (RNCA) Plan, which calls for removal of cattle from the riparian corridors of the Gila Box RNCA, including 23 miles of the Gila River from approximately the old Safford Bridge to Dry Canyon, and 15 miles of Bonita Creek from the confluence with the Gila River to the boundary with the San Carlos Indian Reservation.
6. All suitable pygmy-owl habitat on Bureau lands within the jurisdiction of the Safford and Tucson Field Offices will be mapped within three years. A schedule for completing surveys for pygmy-owls on suitable lands will be identified in an action plan that will be coordinated with the Service. Habitat assessments and surveys for pygmy-owls in critical habitat will receive first priority.
7. The Bureau proposes to conduct (in coordination with Arizona Game and Fish Department) an intensive fish survey in 2000 in the Gila Box and adjacent areas. Limited fish surveys will also be conducted during February-April in 2003 and 2005 on the Gila and/or San Francisco rivers in the Smuggler Peak allotment. If razorback suckers are found during these surveys, the Bureau would consider this new information suggesting the effects of the action may affect the razorback sucker in a manner or extent not previously considered, and in accordance with 50 CFR 402.16(b) would reinitiate consultation on the effects of cattle grazing on habitat in the riparian pasture of the Smuggler Peak allotment.

These revisions to the proposed action change the "Description of the Proposed Action" in the biological opinion as follows. All other aspects of the proposed action remain the same.

Pygmy-Owl Mitigation Measures (pages 61-63 of the biological opinion): Parts (a) and (b) of the mitigation measures are replaced herein with proposed actions as described in items 1, 2, 3, 4, and 5, above. Parts (c)(1) and (2) of the mitigation measures are amended per part 6, above.

Razorback sucker Mitigation Measures (pages 56-57 of the biological opinion): Part (a) of the mitigation measures are replaced with items 1, 5, and 7, above.

CACTUS FERRUGINOUS PYGMY-OWL

Revisions to the Environmental Baseline

New information on the pygmy-owl developed since the biological opinion was issued constitutes new information warranting reinitiation of consultation, pursuant to 50 CFR 402.16(b). Information in items 1-3 is derived from the Bureau's February 22, 1999, and December 3, 1998, correspondence, Bureau reports monitoring implementation of the biological opinion (memos dated November 3, 1998, and March 31, 1998), and our files. Key new information includes:

1. Pygmy-owl habitat surveys have been conducted on Bureau lands in ten allotments in the northwest Tucson area [includes all nine allotments where the biological opinion called for removal of cattle - one of the nine allotments (Newman Peak) has been divided, creating the Walker allotment]. Habitat was rated on a scale of 0-34. Areas rated with a factor score of ≥ 15 were identified as representing vegetation characteristics that the pygmy-owl may use, while good habitat included areas rated ≥ 25 . The Service and the Bureau agreed to focus management on good habitats. No pygmy-owl habitat rated ≥ 25 was found on the Deep Well, Walker, Rail X, or Fresnal Canyon allotments. The remaining six allotments contained ≥ 25 habitat on Bureau lands as follows: Balcom (800 acres), Owl Head (2,560), Claflin (2,720), Cross Triangle (5,920), Newman Peak (640), and Guild Wash (800).
2. A pygmy-owl was found in the Upper Sonoran Desert MLRA on Bureau lands within the Owl Head allotment in 1998. A pair nested (unsuccessfully) on Bureau lands within the allotment in 1999 approximately 3-4 miles east of the bird found in 1998. An additional four pygmy-owl localities have been found in the Upper Sonoran Desert MLRA of the northwest Tucson allotments, including three (1994-1999) on private lands within the Guild Wash allotment, and another on State lands near the Tortollita Mountains (1998) on the Owl Head allotment. One of the localities on the Guild Wash allotment is a nest site with multiple observations of pygmy-owls over a five-year period, including successful fledging of young in 1999 and previous years. At the other three localities, single birds were observed. Several pygmy-owls were also found in 1999 in the Southern Arizona Semidesert MLRA on State lands within the Anvil allotment (Altar Valley, southwest of Tucson) within two to several miles of Bureau lands on the Hay

Hook allotment. Three additional single, male pygmy-owls were observed on State lands in the Black Hills allotment (Altar Valley - Southern Arizona Semidesert MLRA) in 1999. Good habitat for pygmy owls (habitat with factor scores of ≥ 25) on Bureau lands in the ten northwest Tucson allotments were surveyed for owls in 1999. Additional surveys in 1999 were conducted on suitable habitats on Bureau lands within the jurisdiction of the Safford and Tucson Field Offices.

3. Surveys for pygmy-owl habitat were conducted on the mainstem of the Gila River from the old Safford Bridge downstream to Dry Canyon, a distance of 23 miles. Approximately 10 potential habitat areas were found for the pygmy-owl. One area, the "Dorothy B" area, was surveyed for pygmy-owls according to current Service protocol. No pygmy-owls were detected.

4. Surveys in 1999 have more than doubled the number of known pygmy-owls in Arizona. Thirty five owls were known in 1998, while 78 (41 adults and 37 young) were found in 1999. Although the northwest Tucson area remains a crucial area for the species, 19 adult owls were found within the Southern Arizona Semidesert MLRA of the Altar Valley in 1999.

5. Critical habitat was proposed December 31, 1998, and finalized July 12, 1999, for the pygmy-owl. This designation includes Bureau lands in the following allotments: Claflin (6029), Cross Triangle (6144), Owl Head (6083), Guild Wash (6151), Agua Dulce (6126), Agua Blanca (6183), Cocoraque (6020), Tiger (4535), Dry Camp (4534), Hotwell (4539), Hay Hook (6093), Anvil (6100), Elkhorn (6175), Baboquivari (6089), Thomas Canyon (6031), and Three Peaks (6137). The largest parcels of critical habitat are in the Cross Triangle, Owl Head, Guild Wash, Cocoraque, and Agua Blanca allotments, all of which contain five or more sections of critical habitat on Bureau lands.

Effects of the Revised Proposed Action

Gila and San Francisco Rivers; Bonita Creek

Replacement of parts (a) and (b) of the pygmy-owl "mitigation measures" (page 61 of the biological opinion) with items 1, 2, 3 and 4 of "**Changes to the Proposed Action**" above, reduces effects to pygmy-owls on the Gila and San Francisco rivers over the original proposed action evaluated in the biological opinion. This is due in part to a commitment to remove cattle from the Gila Box RNCA, which includes 23 miles of the Gila River and 15 miles of Bonita Creek. In the original proposal, winter grazing would have occurred on 3.5 miles of Bonita Creek and yearlong grazing would have occurred on four miles of the Gila River in the Morenci allotment. No grazing would occur in these areas under the current proposal. The revised proposed action also would implement winter grazing on three miles of the Gila River and 6.6 miles of the San Francisco River in the Smuggler Peak allotment, whereas yearlong grazing was authorized in these areas under the original proposed action. Winter grazing is expected to affect maintenance and development of riparian communities minimally because cattle will not be

present when trees and shrubs are growing and most susceptible to grazing pressure. Also, the Bureau has provided specific management proposals for the northwest Tucson allotments, as described below. In the original proposed action for these allotments, the Bureau committed to avoiding adverse effects to pygmy-owl habitat, but did not describe how that would be accomplished. Other suitable or potentially suitable habitat would be managed to maintain pygmy-owl habitat suitability.

The 10 Northwest Tucson Allotments (Deep Well, Walker, Rail X, Fresno Canyon, Balcom, Owl Head, Claflin, Cross Triangle, Newman Peak, and Guild Wash)

The most restrictive terms and conditions for the pygmy-owl in the biological opinion focused on ten allotments in the northwest Tucson area, which are near a high density of nesting pygmy-owls. No new information exists on the effects of grazing activities (including prescribed fire, range improvements, etc.) proposed by the Bureau on the pygmy-owl. However, recent surveys of habitat and pygmy-owl presence provide a more detailed baseline from which to assess potential effects. A new synthesis of literature on proper utilization and stocking rates in desert scrub and other rangeland habitats is also available (Holecheck *et al.* 1998).

During discussions in 1998, the Bureau and the Service agreed upon a habitat rating survey protocol, and that areas rated with a factored score of 15 or greater contain some characteristics of potential pygmy-owl habitats that may warrant further investigation (suitable habitat), while areas rated 25 or more were considered good habitat for the pygmy-owl. As discussed on the previous page in item 1, six of the 10 allotments surveyed were found to contain good pygmy-owl habitat within the Upper Sonoran Desert MLRA (Balcom, Owl Head, Claflin, Cross Triangle, Newman Peak, and Guild Wash.) Habitat surveys are summarized in attachment A of the Bureau's November 3, 1998, memo.

Effects to suitable and potentially suitable pygmy-owl habitat (as described in part 3, page 3 herein) on Bureau lands in the ten allotments would be avoided or reduced by managing such habitats under the two objectives described in item 3 of "**Changes to Proposed Action**" above: 1) attain sufficient long-term recruitment of cavity trees and saguaros, and 2) achieve or maintain even structural diversity of shrubs, trees, and herbaceous plants. On the six allotments containing good habitat, the Bureau proposed specific management for each allotment that accomplished one or more of the following: 1) reduced utilization rates of 30 percent, 2) elimination of grazing from good habitat, 3) elimination of the base herd and authorization of ephemeral grazing only, 4) minimal base herd and no ephemeral grazing, 4) ephemeral grazing authorized in 30-day increments after March 1 (see above).

The "Effects of the Action" for the pygmy-owl in the biological opinion discussed adverse effects of grazing on pygmy-owl habitat. These effects include 1) construction of range improvement projects (corrals, fences, pipelines, tanks, etc) that destroys nesting or foraging habitat, 2) planting or seeding of nonnative plants, and increased dominance of nonnative annuals caused by grazing, which together may alter fire regimes and increase the chance that a wildfire would occur in occupied pygmy-owl habitat (Schmid and Rogers 1988), 3) vegetation treatments

that result in destruction of nesting or foraging habitat, 4) reduced productivity and vigor of desert ecosystems, 5) trampling and browsing of vegetation cover, including saguaros and their nurse plants, 6) reduction of cryptobiotic crusts, 7) soil erosion and compaction, and 8) reduced water infiltration rates and increased runoff, leaving less water for plant production. Changes in the vegetation community can result in decreased pygmy-owl prey base, increased susceptibility of pygmy-owls to aerial predators, lack of suitable nesting structures, and habitat fragmentation.

Grazing can reduce fire risk by removing fine fuels, and thus may help prevent habitat loss due to catastrophic fire. However, cattle grazing has contributed to the spread and dominance of nonnative annual plants that has created a fire risk in desert scrub (Berry and Nicholson 1984, Kie and Loft 1990, Schmid and Rogers 1988). Overgrazing has also contributed to a conversion of semi-desert grasslands to desert scrub (Bahre 1995). Overgrazed semi-desert grasslands that have been converted to shrublands are typically dominated by snakeweed (*Gutierrezia* sp.), burroweed (*Haplopappus tenuisectus*), cactus (*Opuntia* sp.) and shrubby forms of mesquite (*Prosopis velutina*), and these areas typically lack saguaros. These habitats are not favored by pygmy-owls. However, in areas of transition between semi-desert grassland and desert scrub, grazing may reduce fire risk (if not accompanied by introduction of flammable exotic plants) and cause a shift in species composition towards desert scrub. These altered transitional communities may be enhanced for pygmy-owls if they contain suitable nesting structure; examples of such communities may exist in the Altar Valley.

Range condition of the allotments is found in Table 5 of the opinion and in Table 1 herein. The allotments are primarily in fair or mid-seral range condition. Holechek (1988) and Holechek *et al.* (1998) found that, in desert scrub, average utilization rates of 25-35 percent are appropriate for maintaining range condition. Within that range, several factors determine whether a low, medium, or high value should be selected. Holechek *et al.* (1998) suggest that on ranges in good condition with relatively flat terrain and good water distribution, the higher utilization limit may be appropriate. If the range is in poor or fair condition, or the allotment has thin soils, rough topography, and poor water distribution, the lower utilization rate may be appropriate. The allotments are primarily on flat terrain with variable cattle distribution;

Table 1: Percentages and acres of public land in potential natural community (excellent), late seral (good), mid seral (fair), and early seral (poor) in the six allotments containing good pygmy-owl habitat.

Allotment	Acres (%)				Trend
	Excellent	Good	Fair	Poor	
Balcom	0 (0)	34 (1)	2709 (93)	159 (6)	Static
Owl Head	0 (0)	656 (5)	11732 (95)	0 (0)	Static
Clafin	236 (4)	2555 (42)	3245 (54)	0 (0)	Static
Cross Triangle	0 (0)	0 (0)	23796 (100)	0 (0)	Static
Newman Peak	3000 (45)	0 (0)	3674 (55)	0(0)	Static
Guild Wash	0 (0)	0 (0)	4364 (100)	0 (0)	Static
Totals:	3236 (6)	3245 (6)	49520 (88)	159 (<1)	

proposed utilization rates are 40 percent on most Bureau lands. Based on Holecheck (1988) and Holecheck *et al.* (1998), this utilization rate could result in declining range condition.

Although the allotments are mostly in fair condition, range condition trend is stable, suggesting current management is not resulting in declining range condition, despite high authorized utilization rates. A reduction in utilization rates to 30 percent on good pygmy-owl habitat in the Claflin, Guild Wash, and Cross Triangle allotments should effect a long-term upward trend in range condition, and should, in time, result in greater acreages in later seral stages. Eliminating the base herd on most public lands in the Balcom and Owl Head allotments will limit grazing to December through May, but only in years when ephemeral forage is available (estimated at one year in every 3-5 years). Implementation of the 30-day ephemeral extension policy should ensure that cattle use primarily ephemeral forage and do not switch to perennial shrubs at the end of the season when ephemerals dry out or are eliminated by grazing. This change will also ensure that cattle are not on the range during drought periods, which is often when overutilization occurs. Thus, this change is also expected to result in an upward trend in range condition. Elimination of grazing on the public lands in the Newman Peak allotment will eliminate any effects of the grazing program on the pygmy-owl in this allotment.

Survey data by the Bureau for the 10 allotments has only resulted in discovery of one pygmy-owl in 1998 and a nesting pair in 1999. Both detections were on Bureau lands in the Owl Head allotment within three or four miles of each other. The 1999 nest failed when the saguaro arm containing the nest cavity broke off and fell to the ground killing one of the three nestlings. The other two nestlings were found dead shortly thereafter. Additional synthesis of historic records has revealed four additional records for pygmy-owl in the Upper Sonoran Desert MLRA on the northwest Tucson allotments, including an additional record from the Owl Head allotment and three on the Guild Wash allotment, although none of these birds were found on Bureau lands.

The records just discussed did not exist or were not known by the Service at the time the biological opinion was written. However, based on the presence of apparently suitable habitat and the occurrence of pygmy-owls close to the allotments, we assumed in the opinion that owls were likely to occur on the allotments sometime during the project life (through December 31, 2006). This assumption was born out by the survey data and historic localities.

Habitat and owl surveys conducted since the opinion was written have focused our attention on “good” habitats within six allotments, and particularly within the Owl Head allotment where birds were found on Bureau lands in 1998-1999. Telemetry has demonstrated that juvenile pygmy-owls disperse or move up to many miles from the nest. Mean dispersal distances of juvenile pygmy-owls was 6.2 miles in 1999 in Arizona and 5.5 miles in Texas (Mike Wrigley, Fish and Wildlife Service, Phoenix, AZ, pers. comm. 1999.) The 1998 and 1999 pygmy-owl localities (including the 1999 nest site) on the Owl Head allotment are in the Upper Sonoran Desert MLRA within 2-3 miles of suitable habitats on Bureau lands in the Cross Triangle and Guild Wash allotments, thus, it is likely that these birds or their offspring may disperse to suitable habitats on these two allotments or may occur there in future years. The pygmy-owl nest on the Guild Wash in 1999 is also in the Upper Sonoran Desert MLRA within three miles of

Bureau lands on that allotment and near Bureau lands in the Owl Head allotment. Dispersing young could easily use habitat or establish nesting territories on these nearby Bureau lands in the future. Pygmy-owls occupying Bureau allotments are reasonably likely to be adversely affected by grazing activities. Ways in which owls may be affected were listed on page 7, herein.

The effects of the action include direct and indirect effects, as well as effects of actions that are interrelated and interdependent to the proposed action. In the biological opinion, the Service assumed that the effects of grazing on the non-Federal portions of the allotments are interrelated and interdependent when the Bureau lands exceed 30 percent of the total area within an allotment. Under this land ownership scenario, the way the non-Federal lands are grazed would likely be influenced by how the Bureau lands are grazed. As an example, where the Bureau owns most of an allotment, a decision not to graze the Bureau lands might result in a non-viable operation on other lands in the allotment and a decision not to graze those lands, as well. Of the six northwest Tucson allotments containing good pygmy-owl habitat, only in the Cross Triangle allotment does the Bureau own more than 30 percent of the land. In this allotment, effects of grazing activities on State and private lands are considered effects of the action. No pygmy-owls have been recorded on the Cross Triangle allotment, but both Bureau and State lands in the allotment are within dispersal distance of a pygmy-owl detected this year on the Owl Head allotment.

Allotments Other than the 10 Northwest Tucson Allotments

As described in the “**Changes to the Proposed Action**”, outside of the northwest Tucson area, the Bureau made commitments similar to those in the northwest Tucson area, but the need for specific changes in management, or what changes might be made on each allotment, have not been identified. The Bureau proposes to avoid or reduce effects to suitable habitats and habitats that have potential to be suitable habitat on public lands in other allotments as necessary, based on habitat mapping and assessments and ecological site inventories, through changes in grazing strategies on capable ecological sites in the Upper and Middle Sonoran Desert MLRAs and in drainages within the Southern Arizona Semidesert Grassland MLRA that are mapped by NRCS. These suitable and potentially suitable habitats would be managed under the two objectives discussed previously: 1) attain sufficient long-term recruitment of cavity trees and saguaros, and 2) achieve or maintain even structural diversity of shrubs, trees, and herbaceous plants. After March 1, ephemeral grazing would be authorized in 30-day extensions. If livestock grazing is causing the site to be unsuitable, actions to change current livestock management will be implemented prior to the next grazing year. Changes to livestock management needed to meet the two objectives or prevent a site from becoming unsuitable habitat may include changes in livestock numbers, suspension of grazing, changes in season of use, implementation of a 30 percent utilization limit, or other modifications. Monitoring will be developed to track implementation of the two objectives.

In the Southern Arizona Semidesert Grasslands MLRA of the Altar Valley, pygmy-owls detected on the Anvil allotment are near (as close as two miles) to Bureau lands on the Hay Hook allotment. However, those Bureau lands are almost all above 4,000 feet, and pygmy-owls have

not been found above 4,000 feet in Arizona to date. Also, the Hay Hook allotment is currently in non-use. The pygmy-owls detected on the Black Hills allotment were found 4-5 miles from Bureau lands under 4,000 feet in that allotment, and in the northwest corner of the Sierrita allotment and southwest corner of the Ash Mountain allotment. A total of 2,762 acres of Bureau lands occur in the Black Hills allotment, where range condition falls into the following categories (excellent - 505 acres, good - 1,116 acres, fair - 1,018 acres, and poor - 123 acres), and range condition trend is static. In the Black Hills allotment, grazing occurs under a deferred rotation system and 408 animal unit months are authorized on the Bureau lands. Bureau lands in the Sierrita allotment total 2,154 acres. Grazing occurs under a yearlong grazing regime; 348 animal unit months are authorized on the Bureau lands. Federal acres are largely in good range condition (2,078 acres). The remaining 76 acres are in fair condition. Condition trend is static (Appendix 3 of the biological evaluation). The Ash Mountain allotment contains 586 acres of Bureau lands, all of which are in fair condition with a static trend. A total of 72 animal unit months are authorized on the Bureau lands and cattle are grazed yearlong in the Ash Mountain allotment. Bureau lands constitute less than 30 percent in these three allotments, thus grazing activities on the non-Bureau lands in the allotment are not considered interrelated or interdependent to the proposed action.

Effects of the proposed action on pygmy-owls and their habitat are discussed above for the 10 northwest Tucson allotments and are similar for other allotments that contain suitable or potentially suitable owl habitat. If the two management objectives are met, the habitat values for the pygmy-owl should be maintained. Changing livestock management if grazing is causing a site to be unsuitable is also crucial to maintaining habitats. Although the Bureau has committed to monitor implementation of the two objectives, no details have been provided on how such monitoring will be accomplished. Neither has the Bureau specified how it will determine if livestock grazing is causing a site to be unsuitable. Developing monitoring techniques and criteria for determining effects of grazing on site suitability will be critical for ensuring effects to pygmy-owl habitat are minimized. Nevertheless, if the two objectives are met, and changes are made in livestock management if they are not met or if suitable habitat is becoming unsuitable because of grazing, then grazing activities should have a minimal impact on pygmy-owl habitat.

Possible Take of Cactus Ferruginous Pygmy-Owl

Take of pygmy-owl from some aspect of the proposed action, as described below, is reasonably likely to occur in allotments where the bird occurs or is likely to occur in the future. Pygmy-owls nested on the Owl Head and Guild Wash allotments in 1999. Suitable habitat on Bureau lands within the Cross Triangle allotment is within three miles of, and thus within dispersal or perhaps foraging distance of the 1999 nest site on the Owl Head allotment. All three allotments contain substantial acreage (more than five sections) of Bureau-administered lands in critical habitat and substantial acreage of suitable and good habitat. Three male pygmy-owls were located 4-5 five miles from Bureau lands on the Sierrita, Black Hills, and Ash Mountain allotments in 1999. Pygmy-owls were also found in 1999 on the Anvil allotment within two miles of Bureau lands in the Hay Hook allotment.

Take is not anticipated to occur on Bureau lands within the Hay Hook allotment, because those lands are mostly above 4,000 feet and the allotment is in non-use. The three birds found on the Black Hills allotment, although within five miles of Bureau lands, were single males; no nests were located. As discussed above, mean dispersal distances are 6.2 and 5.5 miles, respectively, for juvenile pygmy-owls in Arizona and Texas; thus the Bureau lands are within dispersal distance of the three pygmy-owl locations. However, because no nests were located, no juvenile dispersal is expected, and thus take is not anticipated on Bureau lands in the Black Hills, Ash Mountain, or Sierrita allotments. Because of the proximity to a 1999 nest site, occurrence of good habitat, and or recent records, take is most likely to occur in the Upper Sonoran Desert MLRA on the Owl Head, Guild Wash, or Cross Triangle allotments. A nest was documented on Bureau lands in the Owl Head allotment during 1999, and nests have occurred (including 1999) within three miles of Bureau lands in the Guild Wash allotment. Good habitat occurs in the Cross Triangle allotment, and Bureau lands are located within three miles of the 1999 nest site on the Owl Head allotment. Nesting adults, eggs, nestlings, and dispersing juveniles could be subject to take as a result of the proposed action over the term (until December 31, 2006) of the proposed action. Take of an owl on these allotments could occur as a result of the following project features: 1) construction of range improvement projects (corrals, fences, pipelines, tanks, etc) that destroys nesting or foraging habitat, 2) planting or seeding of nonnative plants that may alter fire regimes and increase the chance that a wildfire would occur in occupied pygmy-owl habitat (Schmid and Rogers 1988), and 3) chemical or mechanical vegetation treatment or prescribed fire that results in destruction of nesting or foraging habitat.

The Service has no evidence that pygmy-owls presently occur on allotments other than the Owl Head, Guild Wash, Anvil, and Black Hills allotments. However, suitable habitat and critical habitat occurs in several other allotments, many allotments have yet to be surveyed for pygmy-owls, and allotments that currently support no owls may support pygmy-owls in the future. Thus, take could occur as a result of the proposed action in allotments other than the Owl Head, Guild Wash and Cross Triangle if owls inhabit these allotments during the life of the project. Continued surveys to determine if owls are present on allotments will be crucial in future evaluations of where take may occur. In the April 8, 1999, memorandum, the Bureau committed to reinitiating consultation on allotments if nesting pairs of pygmy-owls are found through surveys conducted to standard protocols within three miles of public lands, and if the Bureau determines there may be an adverse effect to the pygmy-owl.

Revision to Cactus Ferruginous Pygmy-Owl Conclusion

The changes to the proposed action do not alter our determination that the proposed action is not likely to jeopardize the continued existence of the cactus ferruginous pygmy-owl. We make this finding for the following reasons:

1. The Bureau has committed to remove cattle from the Gila Box RNCA, which includes 23 miles of the Gila River and 15 miles of Bonita Creek. In the original proposal, winter grazing would have occurred on 3.5 miles of Bonita Creek and yearlong grazing would have occurred on four miles of the Gila River in the Morenci allotment. No grazing would occur in these areas

under the current proposal. Winter grazing is proposed on the Gila and San Francisco rivers through the Smuggler Peak allotment, which should minimize impacts to riparian vegetation.

2. The Bureau has committed to assess pygmy-owl habitat suitability and ensure that livestock management in suitable and potentially suitable habitats in the Upper and Middle Sonoran Desert and Southern Arizona Semidesert Grassland MLRAs (as defined on page 3, herein) is consistent with achieving the following objectives: 1) attain sufficient long-term recruitment of cavity trees and saguaros, and 2) achieve or maintain even structural diversity of shrubs, trees, and herbaceous plants.

3. If livestock grazing is causing a site to be unsuitable as habitat for the pygmy-owl, changes to current management will be made prior to the next grazing season to ensure the above objectives are met.

4. The Bureau has provided specific management proposals for the northwest Tucson allotments, as described in item 4, page 3, which are the allotments closest to a high density population of pygmy-owls. In the original proposed action for these allotments, the Bureau committed to avoiding adverse effects to pygmy-owl habitat, but did not describe how that would be accomplished. The Bureau has further committed to maintaining suitable habitats and enhancing habitat quality in areas that have become unsuitable due to livestock grazing.

5. No new information exists suggesting proposed grazing activities affect cactus ferruginous pygmy-owls to a greater extent than described in the biological opinion.

Our conclusion is based in part on the expectations that 1) appropriate monitoring techniques will be developed and implemented for determining if livestock grazing is causing a site to be unsuitable, and 2) if livestock grazing is causing a site to be unsuitable, appropriate changes in management will be made as necessary to maintain habitat suitability. If these expectations are not met, reinitiation of consultation would be warranted, and the Service would reevaluate whether the proposed action is likely to jeopardize the continued existence of the pygmy-owl or result in destruction or adverse modification of critical habitat [50 CFR 402.16(b and c)]. We encourage the Bureau to work closely with this office in the development of monitoring techniques and criteria for determining if livestock grazing is causing a site to be unsuitable, and in devising needed changes in management. If and when changes in management are proposed, the “**Description of the Proposed Action**” in the biological opinion should be amended.

Effects to Cactus Ferruginous Pygmy-Owl Critical Habitat

Critical habitat for the pygmy-owl overlaps 16 Bureau allotments, which are listed above in item 5, pages 5-6. Effects analyses must determine if the proposed action would destroy or adversely modify critical habitat. "Destruction or adverse modification" means a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the

habitat to be critical (50 CFR 402.02). The primary constituent elements identified in the final rule as necessary for the survival and recovery of the pygmy-owl are those habitat components that are essential for the primary biological needs of foraging, nesting, roosting, and sheltering, including but not limited to, the following:

- 1) Space for individual and population growth, and for normal behavior,
- 2) Food, water, or other nutritional or physiological requirements,
- 3) Cover or shelter,
- 4) Sites for breeding, reproduction, or rearing of offspring, and
- 5) Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species.

Areas above 4,000 feet elevation are generally not considered as pygmy-owl habitat. All Bureau lands in the Hay Hook, Anvil, Elkhorn, Baboquivari, Three Peaks, and Thomas Canyon allotments are above 4,000 feet with the exception of a very small acreage on the Hay Hook allotment. However, that allotment is currently in non-use. In none of these allotments does the Bureau own more than 30 percent of the land, thus there are no interrelated or interdependent activities on State and private lands.

The Agua Dulce, Agua Blanca, and Cocoraque allotments are within the Upper Sonoran Desert MLRA in Unit 2 of the pygmy-owl critical habitat, which lies approximately 12 miles north of Robles Junction and approximately 15-30 miles west of Tucson. All three are among the 49 allotments listed in part (3) of the pygmy-owl mitigation measures of the opinion (pages 61-62) as allotments needing assessment of habitat suitability.

The Tiger, Dry Camp, and Hotwell allotments border the lower San Pedro River. They contain very small portions of critical habitat where these allotments drop into the riparian habitats along the river. The Dry Camp and Hotwell allotments were among the 49 allotments that the Bureau committed to assessing for presence of suitable habitat.

Effects to critical habitat and primary constituent elements can be summarized from the discussion of effects to the species above and in the biological opinion. These effects include the following:

- 1) construction of range improvement projects (corrals, fences, pipelines, tanks, etc) that destroys nesting or foraging habitat, 2) planting or seeding of nonnative plants, and increased dominance of nonnative annuals caused by grazing (Berry and Nicholson 1984, Kie and Loft 1990), that may alter fire regimes and increase the chance that a wildfire would occur in occupied pygmy-owl habitat (Schmid and Rogers 1988), 3) chemical or mechanical vegetation treatment that results in destruction of nesting or foraging habitat, 4) reduced productivity and vigor of desert ecosystems, 5) trampling and browsing of vegetation cover, including saguaros and their nurse plants 6) reduction of cryptobiotic crusts, 7) soil erosion and compaction, and 8) reduced water infiltration rates and increased runoff, leaving less water for plant production. Each of the eight factors above can adversely affect one or more of the five constituent elements. For

instance, changes in the vegetation community, which can be caused by any of the eight factors, can result in decreased pygmy-owl prey base (constituent element #2 from page 13), increased susceptibility of pygmy-owls to aerial predators (constituent elements #3, 4, and 5), lack of suitable nesting structures (constituent element #4), and habitat fragmentation (constituent elements #1-5).

As discussed on page 3 under “**Changes to the Proposed Action**”, suitable and potentially suitable habitats in the Upper and Middle Sonoran Desert and Southern Arizona Semidesert Grassland MLRAs within critical habitat would be managed under the two objectives discussed previously: 1) attain sufficient long-term recruitment of cavity trees and saguaros, and 2) achieve or maintain even structural diversity of shrubs, trees, and herbaceous plants. After March 1, ephemeral grazing would be authorized in 30-day extensions. If livestock grazing is causing the site to be unsuitable, actions to change current livestock management will be implemented prior to the next grazing year. Changes to livestock management may include changes in livestock numbers, suspension of grazing, changes in season of use, implementation of a 30 percent utilization limit, or other modifications.

The two management objectives for suitable habitats within critical habitat are key to maintaining constituent elements of critical habitat. If the objectives are met, the habitat values for the pygmy-owl should be maintained. Changing livestock management if grazing is causing a site to be unsuitable is also crucial to maintaining constituent elements. Although the Bureau has committed to monitor implementation of the two objectives, no details have been provided on how such monitoring will be accomplished. Neither has the Bureau specified how it will determine if livestock grazing is causing a site to be unsuitable. Prompt development of monitoring techniques and criteria for determining effects of grazing on site suitability will be critical for ensuring effects to pygmy-owl habitat are minimized. Nevertheless, if the two objectives are met, and changes are made in livestock management if they are not met or if suitable habitat is becoming unsuitable because of grazing, then grazing activities should have a minimal impact on pygmy-owl habitat.

As discussed on page 76 of the biological opinion, current range condition is determined by an interaction of many factors, one of which is livestock grazing. Range condition is often determined by professional judgement, and some of the data are dated. Nevertheless, it is currently the best information available to us about the condition of the allotments and how grazing may be affecting vegetation communities. Holechek (1988) and Holechek *et al.* (1998) found that, in desert scrub, average utilization rates of 25-35 percent are appropriate for maintaining range condition. Within that range, several factors determine whether a low, medium, or high value should be selected. Holechek *et al.* (1998) suggest that on ranges in good condition with relatively flat terrain and good water distribution, the higher utilization limit may be appropriate. If the range is in poor or fair condition, or the allotment has thin soils, rough topography, and poor water distribution, the lower utilization rate may be appropriate. Proposed authorized utilization rates on allotments in critical habitat is 40 percent, with the exception of the Claflin, Guild Wash, and Cross Triangle allotments, where utilization would be limited to 30 percent, unless alternate management can be devised to minimize impacts to pygmy-owls.

Range condition within allotments in critical habitat are summarized in Table 5 of the opinion and here in Table 2. As with the 10 northwest Tucson allotments (four of which also appear in Table 2), most (77 percent) of the public lands in the allotments that contain critical habitat are rated by the Bureau as being in fair (mid-seral) condition.

Range condition trend for eight of the allotments in Table 2 is static, while it is improving in two allotments. Two of the three allotments with the greatest acreage in poor condition are in an upward range condition trend. Range condition in the allotment with the greatest acreage of range in poor condition (Agua Blanca) is static. Because no allotments exhibit a downward trend in range condition, current management is apparently not causing a deterioration of condition. However, livestock grazing may be impeding recovery of rangelands currently in fair or poor condition. Pygmy-owls are typically found in species rich communities. Rangelands in fair and poor condition exhibit 49 to 25 and 24 to 0 percent, respectively, of a site's potential plant community. As a result, we assume a correlation between range condition and pygmy-owl habitat quality; however, that correlation may be weak in some areas or for certain vegetation

Table 2: Range condition of public land in allotments containing critical habitat under 4,000 feet elevation that is administered by the Bureau. Range condition is given in percentages and acres in the following condition classes: potential natural community (excellent), late seral (good), mid seral (fair), and early seral (poor).

Allotment	Acres (%)				Trend
	Excellent	Good	Fair	Poor	
Owl Head	0 (0)	656 (5)	11732 (95)	0 (0)	Static
Clafin	236 (4)	2555 (42)	3245 (54)	0 (0)	Static
Cross Triangle	0 (0)	0 (0)	23796 (100)	0 (0)	Static
Guild Wash	0 (0)	0 (0)	4364 (100)	0 (0)	Static
Agua Dulce	50 (<1)	1915 (12)	13206 (82)	973 (6)	Upward
Agua Blanca	0 (0)	683 (5)	8758 (61)	4978 (34)	Static
Cocoraque	0 (0)	2942 (32)	3296 (36)	2943 (32)	Upward
Tiger	0 (0)	0 (0)	200 (46)	239 (54)	Static
Dry Camp	0 (0)	0 (0)	298 (50)	300 (50)	Static
Hotwell	0 (0)	1991 (54)	1548 (42)	147 (4)	Static
Total:	286 (<1)	10742 (12)	70443 (77)	9580 (11)	

communities. Range condition in Table 2 suggests livestock grazing is contributing to degraded habitat conditions for the pygmy-owl. Proposed management in suitable habitats within critical habitat on the Owl Head, Clafin, Guild Wash, and Cross Triangle allotments was discussed above under the section on effects to the pygmy-owl in the six northwest Tucson allotments. As discussed, the proposed action in these allotments is expected to maintain or enhance pygmy-owl habitat quality. Management in accordance with the two objectives discussed above, and changing current livestock management prior to the next grazing year if livestock grazing is causing a site to become unsuitable, should maintain habitat suitability elsewhere in critical

habitat. Information presented in Table 2 and the recommendations of Holecheck (1998) and Holecheck *et al.* (1998) suggest reductions in the currently authorized 40 percent utilization may be needed in some of the allotments in Table 2 to maintain habitat suitability or correct situations where grazing is causing a site to be unsuitable.

Cumulative Effects

Cumulative effects are those adverse effects of future non-Federal (State, local government, and private) actions that are reasonably certain to occur in the project area. Future Federal actions would be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project. Effects of past Federal and private actions are considered in the Environmental Baseline. Large parcels of critical habitat in the project area are managed by Federal agencies, particularly the Bureau. Effects of actions that may occur on these Federal lands will be subject to section 7 consultation and thus are not considered cumulative effects. However, many activities are expected to occur on private and State lands that are not subject to the section 7 process.

Residential development of non-Federal lands in the northwest Tucson area is ongoing and presents a significant threat to the high-density pygmy-owl population that occurs there. Residential development is also a threat in other portions of the species' range. Other activities expected to occur on non-Federal lands in pygmy-owl habitat include agricultural uses, continued grazing on private lands, and woodcutting. Use of State lands is primarily as rangeland, with similar effects as described herein. Some activities on State and private lands in critical habitat will require Federal permits (such as Clean Water Act 404 permits), and thus would be subject to section 7 consultation.

Conclusion - Critical Habitat

After reviewing the current status of the cactus ferruginous pygmy-owl, the environmental baseline for the action area, the cumulative effects, and the anticipated effects of the proposed Safford/Tucson Field Office's grazing program, it is the Service's biological opinion that the proposed action is not likely to destroy or adversely modify critical habitat for the cactus ferruginous pygmy-owl.

We present this conclusion for the following reasons:

- 1) On Bureau lands, the Bureau has committed to assess pygmy-owl habitat suitability and ensure that livestock management in suitable and potentially suitable habitats in the Middle and Upper Sonoran Desert and Southern Arizona Semidesert Grassland MLRAs as defined on page 3, herein, is consistent with the following objectives: a) attain sufficient long-term recruitment of cavity trees and saguaros, and b) achieve or maintain even structural diversity of shrubs, trees, and herbaceous plants.

2) If livestock grazing is causing a site to be unsuitable as habitat for the pygmy-owl, changes to current management will be made prior to the next grazing season to ensure the above objectives are met.

3) The Bureau has committed to specific changes in livestock management in critical habitat on the Owl Head, Claflin, Guild Wash, and Cross Triangle allotments that are expected to result in maintenance or improvement of habitat conditions for the pygmy-owl.

Our conclusion is based in part on the expectations that, in critical habitat: 1) appropriate techniques and criteria will be developed and implemented for determining if livestock grazing is causing a site to be unsuitable, and 2) if livestock grazing is causing a site to be unsuitable, appropriate changes in management will be devised and implemented as necessary to maintain habitat suitability. If these expectations are not met, reinitiation of consultation would be warranted and the Service would reevaluate whether the proposed action is likely to result in adverse modification of critical habitat or jeopardy to the species [50 CFR 402.16(b and c)]. We encourage the Bureau to work closely with this office in the development of monitoring techniques and criteria for determining if livestock grazing is causing a site to be unsuitable, and in devising needed changes in management. If and when changes in management are proposed, the **“Description of the Proposed Action”** in the biological opinion should be amended.

Revision of the Pygmy-owl Incidental Take Statement

INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as 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 any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. 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 a prohibited taking 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 implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Bureau has a continuing duty to regulate the activity covered by this incidental take statement. If the Bureau (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to

retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

AMOUNT OR EXTENT OF TAKE

As discussed, with documentation of nesting pygmy-owls and good habitat on the Guild Wash and Owl Head allotments, and presence of a pygmy-owl nest within three miles of Bureau lands on the Cross Triangle allotment, the Service believes take of pygmy-owls is reasonably likely to occur over the life of the proposed action on these allotments from one or more proposed grazing activities. Although pygmy-owls were found in the Southern Arizona Semidesert Grassland MLRA on the Anvil and Black Hills allotments, take as a result of the proposed action is not anticipated in these or nearby allotments. However, pygmy-owls could occur on or near Bureau lands within many allotments over the course of the proposed action. Owls that occur in close proximity to grazing activities could be subject to incidental take in the future.

The level of incidental take that occurs as a result of the proposed action will be difficult to quantify, because birds incidentally taken are unlikely to be found, and if dead or injured birds are found, the cause of death or injury will be difficult to determine. Nevertheless, the Service anticipates that up to one nesting pair of pygmy-owls and one unpaired cactus ferruginous pygmy owls could be harmed due to following:

- 1) Construction of range improvement projects (corrals, fences, pipelines, tanks, etc) or implementation of mechanical or chemical vegetation treatments, or prescribed fire that destroys nesting or foraging habitat, and
- 2) planting or seeding of nonnative plants that may alter fire regimes and increase the chance that a wildfire would occur in occupied pygmy-owl habitat (Schmid and Rogers 1988).

EFFECT OF THE TAKE

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the species when all of the reasonable and prudent measures are implemented. With implementation of the reasonable and prudent measures and their terms and conditions, no incidental take of cactus ferruginous pygmy-owl is likely to occur as a result of the proposed action.

To the extent that this statement concludes that take of any threatened or endangered species of migratory bird will result from the agency action for which consultation is being made, the Service will not refer the incidental take of any such migratory bird for prosecution under the MBTA of 1918, as amended (16 U.S.C. §§ 703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the cactus ferruginous pygmy-owl:

1. Actions shall be taken to minimize direct effects of cattle grazing on those habitats that, based on current knowledge, have the greatest potential to support pygmy-owls.
2. Activities that may result in a take of cactus ferruginous pygmy-owl or destruction of pygmy-owl habitat shall be evaluated, monitored, and modified as needed to reduce potential adverse effects to the pygmy-owl.
3. The Bureau shall monitor incidental take resulting from the proposed action and report to the Service the findings of that monitoring.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Bureau must comply with the following terms and conditions in regards to the proposed action. These terms and conditions implement the reasonable and prudent measures described above. Terms and conditions are nondiscretionary. As of this writing, these terms and conditions apply only to Bureau lands within the Owl Head, Guild Wash, and Cross Triangle allotments. If pygmy-owls are detected on Bureau lands in other allotments or a pygmy-owl nest is found within 6.2 miles (mean juvenile dispersal distance) of suitable (factor score of ≥ 15) habitat on Bureau lands in other allotments, the following terms and conditions shall apply to those allotments as well.

The following terms and conditions implement reasonable and prudent measure number 1:

The Bureau shall implement by the next grazing season the following in good habitats (factor score of 25 or more) in the allotment: 1) limit utilization to 30 percent on key species in key areas, and 2) after March 1, authorize ephemeral extensions only in 30-day increments. Alternatively, the Bureau could develop in coordination and with the approval of the Service alternate grazing regimes that would ensure maintenance of pygmy-owl habitat and thereby avoid take of pygmy-owls. If neither of these alternatives can be implemented, then the Bureau would reinstate consultation on the pygmy-owl¹.

The following term and condition implements reasonable and prudent measure number 2:

¹In their April 8, 1999, memorandum, the Bureau proposed to reinstate consultation if a nesting pygmy-owl is found within three miles of Bureau lands in an allotment and the Bureau determines there is an adverse effect to the pygmy-owl. With implementation of these terms and conditions, the Service believes this commitment is unnecessary. Regulations regarding criteria for reinstatement are found at 50 CFR 402.16.

a. A plan to avoid take of pygmy-owls shall be developed by the Bureau in coordination with the Service for each range improvement project, prescribed fire, or vegetation management project that may adversely affect pygmy-owls or their habitat. Plans for prescribed fire shall limit to the extent practicable the possibility that fire would spread to suitable pygmy-owl habitat. Plans shall be approved by the Service.

b. No planting or seeding of nonnative plants shall be authorized by the Bureau.

The following term and condition implements reasonable and prudent measure number 3:

The Bureau shall submit annual monitoring reports to the Arizona Ecological Services Field Office by March 15 beginning in 2000. These reports shall briefly document for the previous calendar year the effectiveness of the terms and conditions, summaries of surveys for pygmy-owls and habitat evaluations, and, if any pygmy-owls are found dead, suspected cause of mortality. The report shall make recommendations for modifying or refining these terms and conditions to enhance cactus ferruginous pygmy-owl protection or reduce needless hardship on the Bureau and its permittees. This monitoring report should be packaged with other monitoring reports required by the Safford/Tucson grazing biological opinion.

If, during the course of the action, the amount or extent of the incidental take anticipated is exceeded, the Bureau must reinitiate consultation with the Service. In the interim, the Bureau must cease the activity resulting in the take if it is determined that the impact of additional taking will cause an irreversible and adverse impact on the species, as required by 50 CFR 402.14(i). An explanation of the causes of the taking should be provided to the Service.

Continuing surveys of suitable habitats and for pygmy-owls, combined with the results of the grazing study proposed as part (c)(3) of the “mitigation measures” on pages 62-63 of the biological opinion, may yield new information suggesting the effects of the action may affect the cactus ferruginous pygmy-owl in a manner or to an extent not previously considered. If this occurs, reinitiation of consultation will be warranted [50 CFR 402.16(b)].

Revisions to Pygmy-Owl Conservation Recommendations

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the cactus ferruginous pygmy-owl. In furtherance of the purposes of the Act, we recommend implementing the following actions:

1. Encourage private landowners with riparian communities on their property to seek assistance in removing cattle from riparian areas or taking other riparian restoration measures through the Service's Partners for Fish and Wildlife Program.

2. In all suitable habitats for pygmy-owls, remove cattle until such time that studies show grazing does not adversely affect survival or recovery of the pygmy-owl.

3. Close monitoring should be conducted on the Balcom, Owl Head, Claflin, Cross Triangle, Agua Dulce, Agua Blanca, and Guild Wash allotments. If range condition on these allotments does not improve, the Service recommends further action be taken to reduce utilization rates or otherwise change grazing strategies to improve range condition.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species, the Service requests notification of implementation of any conservation actions.

(Note: surveys involving simulated or recorded calls of cactus ferruginous pygmy-owls require an appropriate permit from the Service. Arizona Game and Fish Department should be contacted in regard to State permitting requirements.)

RAZORBACK SUCKER

Revisions to the Environmental Baseline

New information on the razorback sucker has been developed since the biological opinion was issued. This information is detailed in the Bureau's February 22, 1999, and December 3, 1998, correspondence, as well as in Bureau reports monitoring implementation of the biological opinion (memos dated November 3, 1998, and March 31, 1998.) This new information is summarized here:

Lower Bonita Creek and Bonita Creek above Red Knolls were surveyed for razorback suckers by the Bureau in April 1998. Limited fish surveys were conducted by SWCA, Inc., Environmental Consultants, on the Gila River through the Safford Valley from Solomon Bridge to Pima Bridge using electroshocking and seining techniques. No razorback suckers were found.

Effects of the Revised Proposed Action

The revised proposed action would result in significantly reduced impacts to razorback suckers and their critical habitat relative to the original proposed action evaluated in the biological opinion. This is primarily due to a commitment to remove cattle from the Gila Box RNCA, which includes 23 miles of the Gila River and 15 miles of Bonita Creek. In the original proposal, winter grazing would have occurred on 3.5 miles of Bonita Creek and yearlong grazing would have occurred on four miles of the Gila River in the Morenci allotment. No grazing would occur in these areas under the current proposal. The revised proposed action also would implement winter grazing on three miles of the Gila River and 6.6 miles of the San Francisco River in the Smuggler Peak allotment, whereas yearlong grazing was authorized in these areas under the original proposed action. Proposed surveys for razorback suckers are probably unlikely to detect

razorbacks because they are apparently rare in these river systems. Failure to find them during such surveys does not prove they are absent. However, the information collected will contribute to the environmental baseline and our knowledge of fish communities in critical habitat; and consultation would be reinitiated if razorback suckers are found. The timing of the surveys in 2003 and 2005 - February through April - increases the chances of finding spawning razorback suckers.

Possible Take of Razorback Sucker

The Bureau's commitment to remove grazing from the Gila Box RNCA, which includes 23 miles of the Gila River and 15 miles of Bonita Creek, combined with a term and condition for the loach minnow that eliminates grazing on the San Francisco River in the San Francisco and Red Hickey Hills allotments, removes grazing from most suitable razorback sucker habitat. The only razorback sucker habitat on Bureau lands in the project area where cattle would not be removed is three miles of the Gila River and 6.6 miles of the San Francisco River on the Smuggler Peak allotment, which would be in a riparian pasture. The riparian pasture would be grazed only from November to April, and if razorback suckers were detected during fish surveys conducted in 2000, 2003, or 2005, the Bureau would reinitiate consultation.

These commitments by the Bureau and apparent rarity of razorback suckers make it unlikely that take would occur. Thus, we do not anticipate take of razorback suckers as a result of the proposed action. If razorback suckers are detected on fisheries surveys, this may indicate the species is more abundant than we thought and the Service will reevaluate the need for an incidental take statement during reinitiation of consultation.

Revised Conclusion for the Razorback Sucker

After reviewing the current status of the razorback sucker, the environmental baseline for the action area, the anticipated effects of the proposed grazing program, and cumulative effects, it is the Service's biological opinion that the proposed action is neither likely to jeopardize the continued existence of the razorback sucker nor likely to destroy or adversely modify critical habitat designated for the species. We present these conclusions for the following reasons:

1. The Bureau proposes substantial measures that significantly reduce the adverse effects of the action to the razorback sucker and its critical habitat.
2. The Bureau proposes to eliminate direct effects of grazing that may jeopardize the continued existence of the razorback sucker on Bureau lands in the project area.
3. Cattle will be removed from the Gila Box RNCA, which includes 23 miles of the Gila River and 15 miles of Bonita Creek, and only winter grazing will be allowed on three miles of the Gila River and 6.6 miles of the San Francisco River in the Smuggler Peak allotment.

4. Fisheries surveys will be conducted in 2000 in the Gila Box area, and in February-April of 2003 and 2005 on the Smuggler Peak allotment. Consultation will be reinitiated if razorback suckers are found.

5. The Bureau proposes to work with the Service to limit possible risks of nonnative fish introduction as a result of stock tank construction, operation, and maintenance.

6. The Bureau proposes to take action to ensure that range condition does not deteriorate on Bureau lands in the watershed of razorback sucker habitat, and to improve range condition in areas of fair or poor condition.

7. Numbers of razorback suckers in the project area are likely very low due to predation by nonnative fish and degraded habitat conditions.

Modification of the Razorback Sucker Conservation Recommendations

The Service adds the following to the Conservation Recommendations for the razorback sucker:

1) The Bureau should work with Jeff Menges to find alternatives to winter grazing in the riparian pasture on the Gila and San Francisco rivers in the Smuggler Peak allotment.

2) Trailing through razorback sucker habitat should be limited to moving cattle across the Gila River between the Smuggler and Zorilla allotments no more than twice a year, trailing on approximately 0.25 mi of the San Francisco River in the San Francisco allotment no more than twice a year, and trailing on Bonita Creek to move cattle between pastures. Trailing should be conducted so that: a) cattle are present for the shortest period of time possible in riparian/aquatic areas, b) the shortest route across the river is taken, c) trailing across riparian/aquatic areas is conducted as infrequently as possible, d) trailing is conducted when bankline soil moisture is relatively low, whenever possible, and e) trailing across Bonita Creek is limited to the shortest routes possible, not to exceed 1.5 mi of the creek.

ARIZONA HEDGEHOG CACTUS

Changes to the Proposed Action

The Bureau has requested that proposed mitigation measures 7.a., b, and c. for the Arizona hedgehog cactus, at page 50 of the biological opinion, be deleted. These measures are:

“7. To protect Arizona hedgehog cactus:

(a) Construction of fences or pipelines in potential Arizona hedgehog cactus habitat will be preceded by 100-percent surveys of areas to be disturbed, and modification(s) of the project as needed will be implemented to avoid impacts to individual cacti.

(b) No planting/seeding of nonnative plants will be authorized by the Bureau in the 86 allotments where the Arizona hedgehog cactus occurs or potentially occurs (see Bureau 1996a for identification of 86 allotments).

(c) In suitable Arizona hedgehog cactus habitat in the 86 allotments, the Bureau will develop and implement mitigation plans, approved by the Service for the following actions. No mitigation plan is necessary if surveys are conducted pursuant to part 7(a) and no hedgehog cacti are found in areas affected by the actions (including the 0.5 mile radius around projects indicated herein):

- (1) development of new water sources within 0.5 mile of Arizona hedgehog cactus.
- (2) changes in cattle distribution resulting from water developments, modifying grazing systems, or other changes that result in increased numbers of cattle in any portion of an allotment where Arizona hedgehog cactus occurs.
- (3) construction or improvement of roads or trails within 0.5 mile of Arizona hedgehog cactus.
- (4) prescribed fire within 0.5 mile of Arizona hedgehog cactus.
- (5) chemical or mechanical vegetation management in habitat or potential habitat of the cactus.”

Revision of the Effects of the Proposed Action

Robert Bellsey and David Mount, University of Arizona, compared *Echinocereus triglochidiatus* var. *arizonicus* from the type locality with *E. triglochidiatus* and *E. coccineus* from other localities in Arizona, New Mexico, Texas, and Colorado by way of sequencing a 450 nucleotide region of chloroplast DNA. In a preliminary report, Bellsey and Mount (1999) find that results are insufficient to make an unambiguous classification of plants by species and variety. However, three genotypes emerged: 1) type A, including plants from the *arizonicus* type locality; Gunnison Hills, Chiricahua Mountains, and Dos Cabezas Mountains in Cochise County; Kingman, Mojave County; five sites on the Clifton Ranger District of the Apache-Sitgreaves National Forest; Bonita Creek and Markham Creek in the jurisdiction of the Safford Field Office; 20 miles west of Carlsbad, New Mexico; and near Marfa, Texas; 2) type T from several sites in New Mexico; and 3) type M from New Mexico and the Santa Rita Mountains, Arizona.

Bellsey and Mount’s work provides evidence that plants from the *arizonicus* type locality are closely related to plants at other sites, including Bureau lands at Bonita and Markham creeks, but whether they are the same taxonomic entity is as unclear now as when the biological opinion was written in 1997. If Bellsey and Mount’s type A genotype is the *arizonicus* variety, then the status of the species is much enhanced over that evaluated in the final rule listing the species as endangered (44 FR 61557). In that rule, we found that the variety is only known from a few localities near the boundary between Gila and Pinal counties (the area of the type locality).

In the final rule, we acknowledged that cacti existed outside of the type locality area that were difficult to classify. However, the rule found that “Different varieties within the species *Echinocereus triglochidiatus* intergrade extensively with one another. Mixed populations showing extensive variation but with some affinities toward var. *arizonicus* are not to be considered classical var. *arizonicus* and therefore will not be subject to the protection and restrictions of the Endangered Species Act.” Given the language in the rule and that cacti outside of the type locality area have not been confirmed as *arizonicus*; the Bureau’s proposed action does not affect the Arizona hedgehog cactus because none of the allotments under consultation are located in the type locality area. Thus, removal of the mitigation measures for the cactus from the Bureau’s proposed action does not affect the taxon, and does not alter our determination that the proposed action is not likely to jeopardize the continued existence of the Arizona hedgehog cactus.

However, note that the Service does not have the authority to list distinct population segments of plants. Thus, if plants outside of the type locality area are found to be of the variety *arizonicus*, then they would be protected by the Act.

HUACHUCA WATER UMBEL

Additions to the Environmental Baseline:

Critical Habitat

Critical habitat was designated for the Huachuca water umbel on July 12, 1999; including 33.7 miles of the upper San Pedro River from approximately 600 feet south of Hereford Bridge to just north of Fairbank, and on 18.0 miles of stream reaches in the Huachuca Mountains, San Rafael Valley, and Sonoita Creek. With the exception of a small privately-owned reach on the Brunchow Hill allotment, the 33.7 mile critical habitat reach on the San Pedro River is managed by the Bureau. The upper San Pedro River is the only large, contiguous habitat of the water umbel; thus it is considered the most important of the critical habitat areas to the survival and recovery of the species. Groundwater pumping in the upper San Pedro basin threatens to dewater the river (San Pedro Expert Study Team 1999) and is considered the most serious threat to water umbel populations and critical habitat on the San Pedro River (Bureau of Land Management 1998). Critical habitat north of Charleston, particularly near the Babocomari confluence, (15.3 miles) is most at risk, followed by the reach from Highway 90 to Charleston (5.5 miles) (U.S. Fish and Wildlife Service 1999).

Additions to the Effects of the Proposed Action

Effects to Critical Habitat

Critical habitat affected by the proposed action is limited to the 33.7- mile reach of the upper San Pedro River. Effects analyses must determine if the proposed action would destroy or adversely modify critical habitat. "Destruction or adverse modification" means a direct or indirect

alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical (50 CFR 402.02). The primary constituent elements identified in the final rule as necessary for the survival and recovery of the Huachuca water umbel include, but are not limited to, the habitat components which provide the following:

- (1) Sufficient perennial base flows to provide a permanently or nearly permanently wetted substrate for growth and reproduction of Huachuca water umbel;
- (2) A stream channel that is relatively stable, but subject to periodic flooding that provides for rejuvenation of the riparian plant community and produces open microsites for water umbel expansion;
- (3) A riparian plant community that is relatively stable over time and in which nonnative species do not exist or are at a density that has little or no adverse effect on resources available for water umbel growth and reproduction; and
- (4) In streams and rivers, refugial sites in each watershed and in each reach, including but not limited to springs or backwaters of mainstem rivers, that allow each population to survive catastrophic floods and recolonize larger areas.

Effects of livestock grazing activities on the habitat of the Huachuca water umbel were described in the biological opinion. Grazing and associated activities can adversely affect constituent elements. Degradation of watersheds as a result of grazing can destabilize channels and cause higher high flows and lower low flows (Gifford and Hawkins 1978, Blackburn 1984, DeBano and Schmidt 1989), possibly scouring water umbel habitats or drying them out (constituent elements 1 and 2). The biological opinion also found that degraded watershed condition caused by grazing can reduce infiltration of precipitation, exacerbating problems associated with groundwater overdraft (constituent element 1). Cattle grazing can promote establishment of nonnative plants in riparian systems (constituent element 3) (Stromberg and Chew 1997). During dry periods, both cattle and water umbel depend on remaining wetted areas. Concentrations of cattle during drought can severely impact plant communities and channel morphology in these last few wetted places; these places are also critical refugia for water umbel (constituent element 4).

The Bureau committed to not authorize grazing in the San Pedro River Riparian National Conservation Area (RNCA), which includes all Bureau lands designated as critical habitat, for the life of the project (through December 31, 2006). Although the biological opinion noted that trespass grazing was occurring, and that it was locally intense, the Bureau has taken action to control trespass cattle. Trespass continues to be a problem, but is less so now than in 1997 when the opinion was finalized. The Service is not aware of any water umbel populations or critical habitat on the San Pedro River that is heavily used by cattle. No range improvement projects or chemical or mechanical vegetation management has occurred as part of the grazing program in

the RNCA, and none are anticipated during the life of the project. Additional measures were proposed by the Bureau to improve the condition of the watershed. Although progress on implementing these measures (such as AMP completion and implementation, technical assistance to landowners and permittees, watershed improvement projects) has been hampered by lack of adequate staff and funding, the Bureau is still committed to these actions (the Bureau's March 2000 Annual Report on implementation of the opinion).

Cumulative Effects

Cumulative effects are those adverse effects of future non-Federal (State, local government, and private) actions that are reasonably certain to occur in the project area. Future Federal actions would be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed project. Effects of past Federal and private actions are considered in the Environmental Baseline. Ninety-five percent of critical habitat is located on Federal lands. Thus, the effects of most actions on this plant will be subject to section 7 consultation and are not considered cumulative. The most serious cumulative effect of which the Service is aware is groundwater pumping in excess of recharge in the upper San Pedro River basin. As discussed above, groundwater pumping threatens to lower groundwater elevations and reduce or eliminate surface flows in the San Pedro River (San Pedro Expert Study Team 1999). Much of the groundwater pumping is by private entities without a Federal nexus. However, in a recent biological opinion, the Service found that groundwater pumping attributable to Fort Huachuca is not likely to jeopardize the continued existence of the species or result in destruction or adverse modification of critical habitat. The rationale for this conclusion was that the efforts of the Fort and other public and private water users in the basin, combined with national and international initiatives, were expected to develop a solution to groundwater overdrafts before significant effects occurred to the river.

Conclusion - Critical Habitat

After reviewing the current status of the Huachuca water umbel, the environmental baseline for the action area, and the anticipated effects of the Safford/Tucson Field Offices' grazing program, it is the Service's biological opinion that the proposed action is not likely to result in destruction or adverse modification of critical habitat designated for the Huachuca water umbel. We present this conclusion for the following reasons:

1. The Bureau has committed to not authorize grazing or other grazing-related activities in critical habitat of the water umbel.
2. The Bureau is taking action to control trespass grazing.
3. The Bureau has committed to actions that will improve the condition of the San Pedro River watershed.

Changes to the Proposed Action

Removal of the 47 Ranch Allotment from Table 7

The Bureau has requested that the 47 Ranch allotment (5233) be removed from Table 7, page 52, of the biological opinion. Allotments listed in Table 7 are subject to mitigation measures e, h, l, and m for the Huachuca water umbel. The Service's intent was to include on this list allotments that include the upper San Pedro River or the watershed of the river. Although the 47 Ranch allotment includes lands in the upper San Pedro basin, Bureau lands in the allotment are on the east side of the Mule Mountains, outside of the San Pedro River watershed. The Bureau lands comprise less than 30 percent of the acreage in the allotment; thus grazing activities occurring on the non-Bureau portions of the allotment are not considered interrelated or interdependent activities (see page 75 of the biological opinion). As a result, removing the 47 Ranch allotment from Table 7 does not change the effects of the action in regard to the Huachuca water umbel or its critical habitat, and does not alter our previous determination that the proposed action is not likely to jeopardize the continued existence of the Huachuca water umbel or result in destruction or adverse modification of critical habitat.

Summary of Conclusions for Other Listed Species Addressed in the Biological Opinion

Changes to the proposed action do not alter our previous determinations that the proposed action is not likely to jeopardize the continued existence of Kearney's blue star, Pima pineapple cactus, Nichol's turk's head cactus, desert pupfish, spokedace, Gila topminnow, loach minnow, southwestern willow flycatcher, lesser long-nosed bat, jaguar, and New Mexico ridgenose rattlesnake, and is not likely to adversely modify or destroy critical habitat designated for the southwestern willow flycatcher. Nor do they change our concurrences with the Bureau's determinations that the proposed action may affect, but is not likely to adversely affect eight additional species.

If we can be of further assistance in this matter, please contact Jim Rorabaugh (x238) or Sherry Barrett (520/670-4617) of my staff.

/s/ David L. Harlow

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