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AESO/SE
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October 31, 2003

Memorandum

To: Field Manager, Kingman Field Office, Bureau of Land Management, Kingman, Arizona

From: Field Supervisor

Subject: Hayden Peak Communications Sites Road Maintenance Plan

Thank you for your request for formal consultation with us pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request for consultation dated July 2, 2003, was received by us on July 7, 2003. At issue are impacts that may result from implementation of the Bureau of Land Management's (BLM) proposed Hayden Peak Communications Sites Road Maintenance Plan in Mohave County, Arizona. The species of concern in this consultation is the endangered Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*). We are considering this to be a reinitiation of consultation because your proposed action contains many elements of the original consultation which was concluded informally in 1995.

In your memorandum, you requested our concurrence that the proposed action is not likely to adversely affect the threatened Mexican spotted owl (*Strix occidentalis lucida*). We concurred with this finding in our memorandum dated October 8, 2003.

This biological opinion is based on information provided in your May 26, 1995, memorandum and Biological Evaluation (BE), our September 11, 1995, concurrence with your July 2, 2003, BE and memorandum requesting initiation of formal consultation on implementation of the Hayden Peak Communications Sites Road Maintenance Plan (including a new method of roadbed reconstruction using a United States Forest Service Road Grinding Method), your September 8, 2003, revised BE, telephone conversations, field investigations, 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, effects of road maintenance activities, or other subjects considered in this opinion. A complete administrative record of this consultation is on file in this office.

Consultation History

May 26, 1995 - The BLM requested consultation and requested our concurrence with their determination that the action is not likely to adversely affect the Hualapai Mexican vole and will not affect the American peregrine falcon and Mexican spotted owl.

September 11, 1995 - We issued our concurrence that the proposed action is not likely to adversely affect the Hualapai Mexican vole or the Mexican spotted owl, and will not affect the American peregrine falcon.

February 14, 2003 - BLM contacted us regarding the new proposed action.

July 7, 2003 - We received the BLM's final BE and request for formal consultation.

July 29, 2003 - We issued a memorandum to BLM acknowledging initiation of formal consultation.

August 7 and 19, 2003 - We requested further information from BLM.

September 8, 2003 - BLM submitted an updated BE containing additional conservation measures and information.

September 15 and October 6, 2003 - BLM provided further information.

October 20, 2003 - We issued a draft biological opinion to BLM for review.

October 23, 2003 - BLM submitted an updated BE and asked us to finalize the biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The following description of the proposed action is primarily from the project description provided in the September 8, 2003, BE. The Kingman Area Communications Sites Users Association (Users Association), of which BLM is a member, is proposing to maintain the Hayden Peak Communications Sites Road in the Hualapai Mountains that serves several communications sites (Map 1). The road is approximately 3 miles long, and averages 25 feet in width. It was originally engineered to handle up to a 100-year flood event. Approximately 27 percent of the route occurs on lands administered by the BLM, with the other 73 percent occurring on Hualapai Mountain County Park (Park) lands managed by Mohave County. The three communications sites occur on lands managed by the BLM. They include a 40-acre site on the upper portion of the road, known as the Hayden Peak Communications Site, and two 10-acre

sites on the lower portion of the road, known as Potato Patch I and II. The lower portion of the route begins on Park lands at a locked gate west of Recreation Site #3 and proceeds approximately 0.9 miles west to a turn-off to the first site, Potato Patch II (T20N, R15W, Sec. 19), then proceeds south approximately 0.21 miles to a turn-off to the second site, Potato Patch I (T20N, R15W, Sec. 30), then proceeds south through the Park, past Boy Scout Camp Levi Levi approximately 0.32 miles to Wheeler Wash. The upper portion of the road begins where the road crosses Wheeler Wash and continues approximately 1 mile south to the top and the Hayden Peak Communications Site (T20N, R15W, Sec. 30). The highest priority for the Users Association is the upper portion of the road. Depending on funds available from the Users Association and/or Mohave County, additional work may occur along the lower portion of the road.

The proposed action consists of three maintenance methods. The first method involves roadbed reconstruction using United States Forest Service road grinding equipment (USFS Method) as outlined in the September 2003 BE. The second method involves major road maintenance (Original Method) as outlined in the 1995 BE and amended in the September 2003 BE. The third method involves Annual Maintenance activities as outlined in the 1995 BE and amended in the September 2003 BE. Any one or a combination of all methods would be implemented over the life of the project. The BLM has requested that the proposed activity be evaluated for the term of the right-of-way, through May 2027.

1. USFS Method

Over the life of the project a repeat of this method may be implemented up to a total of four times. This method reflects a proposed change in the way major maintenance would be performed as defined in the 1995 BE, and is considered to be an improvement over the method used to date for the Hayden Peak Road. This method uses no material borrow sites and is expected to reduce the need for annual maintenance. All fill material would be taken from the roadbed.

Road work is estimated to take 1 to 2 days on the upper portion of the road and 2 to 3 days on the lower portion of the road. Work on the entire road would take 3 to 5 days to complete if done all at once. The BLM has indicated that this will be the first method used to conduct road maintenance. The initial maintenance is scheduled to be conducted in early November 2003.

This method uses a front-end loader with roto-mill attachment to grind off rock protrusions and create material to a 3-inch minus diameter. A D-5 dozer follows behind the roto-mill, moving the loosened material and shaping the road to an in-slope template. The D-5 is then used to build water bars, finalizing the road reconstruction process. To increase road stability, a road roller/compactor may be used if it is available. When not in use, equipment would be parked in turnouts within the existing road footprint.

Additional water bars would be installed beyond those identified in the Original Method to protect the integrity of the road. It is estimated that no more than 150 water bars will be constructed. Most water bars would be placed to direct water to the in-slope, and where possible the water from the in-slope would be directed to drain into existing culverts. Placement would be based upon BLM and USFS engineering criteria including slope, soil type, and aspect. Water bars would also be placed to minimize drainage into occupied, suitable, and historical vole habitat. In these habitats, a biologist along with the USFS engineer would together determine the placement of each water bar to minimize the erosion and/or sediment deposition into vole habitat. Both the Annual and Original maintenance methods would maintain the additional water bars constructed under this method.

It is estimated that one water bar per 60 feet of road length would be installed. However, in the area where suitable and occupied habitat has been identified (upper portion of the road), there are sections of steep slopes (10-15 percent grade). In this area it is estimated that water bars would be placed as little as 30 feet apart due to the engineering criteria calling for more water bars to reduce water volume and velocities on steep slopes. It is anticipated that no more than 37 water bars would be installed through the suitable/occupied habitat area. This area is approximately 2,000 feet long and extends from Wheeler Wash to the first switchback. In this area the outlets or nick-points (slope-breaks) of each water bar installed in occupied, suitable, or historical habitat, or that could affect vole habitat, would be armored with rock aprons to reduce water volume and velocity, and dissipate energy. These rock aprons would be approximately 3 feet wide by 3 feet long.

2. Original Method

Over the life of the project a repeat of this method may be implemented up to a total of four times, and is expected to take 4 to 6 days to complete work on the entire road. Equipment used would include a road grader, bulldozer, front-end loader, and hand tools. Heavy equipment would be used to construct water bars, clean out and maintain ditches, fill in erosion cuts, remove large boulders, grade, and use material borrow sites. Maintenance such as crowning and ditching the road would occur only where required to prevent or repair significant maintenance problems such as impassable washouts and ongoing erosion problems. Unnecessary scraping of the road surface and banks would not be permitted. Stable road conditions such as compacted, non-eroding soils and vegetation will be left intact and undisturbed whenever possible.

Chainsaws and hand tools would be used to remove vegetation which is dead, down, or presents a specific hazard to road travel. Where possible, vegetative root systems would be left in place to help stabilize soils along the route. In some areas of suitable, occupied, or historical vole habitat, it may be necessary to perform culvert and drainage maintenance using hand tools to reduce excess soil disturbance created by heavy

equipment. Areas where no site-specific problems exist would remain undisturbed and herbaceous vegetation (grasses and forbs) would be left to stabilize soils.

Explosives and pneumatic hammers may be used to remove large hazard rocks or install culverts and other flood control structures. These activities will not be conducted within suitable habitat, and will not occur within one quarter mile of occupied vole habitat.

3. Annual Maintenance

It is anticipated that Annual Maintenance would occur once per year for 1 day per year (although the frequency of maintenance is expected to be reduced if the USFS method of roadbed reconstruction is used). Annual maintenance would consist of reestablishing/maintaining water bars, cleaning ditches and culverts, removing large boulders, filling in erosion cuts, using material borrow sites, and grading. Equipment to be used would include a front-end loader, road grader, and hand tools. Unnecessary scraping of the road surface and banks would not be permitted. Stable road conditions such as compacted, non-eroding soils and vegetation will be left intact and undisturbed whenever possible.

Chainsaws and hand tools would be used to remove vegetation which is dead, down, or presents a specific hazard to road travel. Where possible, vegetative root systems would be left in place to help stabilize soils along the route. In some areas of suitable, occupied, or historical vole habitat, it may be necessary to perform culvert and drainage maintenance using hand tools to reduce excess soil disturbance created by heavy equipment. Areas where no site-specific problems exist would remain undisturbed and herbaceous vegetation (grasses and forbs) would be left to stabilize soils.

Explosives and pneumatic hammers may be used to remove large hazard rocks or install culverts and other flood control structures. These activities will not be conducted within suitable habitat, and will not occur within one quarter mile of occupied vole habitat.

The BLM has defined vole habitat as follows:

Occupied Habitat: Any habitat area where vole sign (fresh or old) is found. Sign can be fecal pellets, runways, grass/forb clippings, or voles.

Suitable Habitat: Any habitat area that exhibits classic characteristics of vole habitat (understory trees and abundant grass, forb, and low shrub cover) but has no evidence of vole occupation.

Historical Habitat: Areas where voles or their sign have been documented. Most of these areas would also be suitable.

Potential Habitat: Any habitat area that has the potential to develop into suitable vole habitat given appropriate physical and climatic conditions, and management actions.

Conservation measures

The BLM has proposed the following conservation measures to minimize effects to Hualapai Mexican voles from the proposed action:

1. All methods of maintenance activities would be scheduled outside the Hualapai Mexican vole breeding season (April 1 – September 30) except during emergencies such as major wash-outs and rock falls that make the road impassable.
2. Prior to all maintenance and road reconstruction activities, a biologist would conduct a vole habitat pre-construction survey of the project area to determine areas of occupied, suitable, historical, and potential habitat. All occupied, suitable, and historical vole areas occurring within 30 feet of the road that could be impacted by road erosion and sedimentation (i.e. downslope of the road) would be flagged. The biologist would be thoroughly familiar with voles and their habitat requirements. Surveys would follow Arizona Game and Fish Department's 1994 "Survey Techniques for Mexican Voles in Northwest Arizona" with the exception that no trapping would be conducted.
3. A biologist would conduct a briefing and pre-construction walk-through of the project site with all maintenance crews. Placement and/or maintenance of water bars in the flagged vole habitat areas would be avoided as much as possible. Where necessary, placement of water bars in vole habitat would be determined by the crew and the biologist. The briefing would stress the need to remain within the road footprint and the need to minimize disturbance along the entire route. The biologist would recommend the use of hand tools as necessary to further reduce potential impacts to voles and their habitat.
4. All work would stress minimal disturbance to soils and vegetation.
5. All work would take place within the existing road footprint with the exception of the material borrow sites (Original Method and Annual Maintenance) and apron placement/maintenance below the water bars.
6. No material removed from the road would be deposited in occupied, suitable, historical, or potential vole habitat.
7. The two proposed material borrow sites closest to the two known vole locations near Wheeler Wash at the Boy Scout Camp would not be used. Any borrow sites not indicated on the map provided for the 1995 consultation will not be used. There are a total of nine borrow sites identified for use. No vole habitat would be disturbed in using any borrow sites.

8. The roads would not be improved beyond traffic conditions that require four-wheel drive or high clearance two-wheel drive vehicles.
9. Chemical soil stabilizers will not be used.
10. A biologist would be present during all road reconstruction and maintenance activities occurring in occupied, suitable, or historical vole habitat, and that may affect voles and their habitat.
11. The biologist would conduct a post-construction inspection following the first significant rainfall event (≥ 1 inch in 1 day) to evaluate the effectiveness of road maintenance and its impacts to voles and their habitat.
12. Measures employed by the Users Association and BLM to protect the Hualapai Mexican vole would be implemented along the route regardless of land ownership or method used. The Users Association would continue to be responsible for road maintenance throughout the life of the project.
13. Explosives and pneumatic hammers may be used under the Original and Annual maintenance methods to remove large hazard rocks or install culverts and other flood control structures. These activities will not be conducted within suitable habitat, and will not occur within 1/4 mile of occupied vole habitat.
14. To prevent the spread of noxious weeds or invasive species, all heavy equipment used during road maintenance would be washed (including undercarriages) to remove any weed seeds or plant parts prior to being transported to the project area.
15. A brief report summarizing the year's work will be provided annually before February 1 for the life of the project. The report will include an evaluation of any work accomplished, any affects on Hualapai Mexican voles or their habitat, the extent of involvement by biologists during maintenance, any vole observation records, and a projection of work that is likely to be performed in the next year.
16. We would be consulted if additional maintenance methods are proposed that have not been previously consulted upon.

STATUS OF THE SPECIES (RANGE-WIDE)

Hualapai Mexican vole

Species description

The Hualapai Mexican vole was listed as an endangered species without critical habitat in a Federal Register notice dated November 2, 1987 (52 FR 36776). The Hualapai Mexican vole is

listed as endangered on the Arizona Game and Fish Department's list of Threatened Native Wildlife in Arizona.

The Hualapai Mexican vole was first described in 1938 by E. A. Goldman. Although Hoffmeister (1986) accepted the taxonomy, he considered it to be a "poorly defined subspecies, in part because the sample size is so small." A total of 15 Hualapai Mexican voles were observed or handled between 1923 and 1984 (U.S. Fish and Wildlife Service 1991). The Hualapai Mexican vole is a thick-set, blunt-nosed, short-legged rodent, with a short tail and small ears obscured by coarse dark cinnamon-brown fur. In comparison to the two other subspecies of Mexican vole in the United States (i.e., *M. m. mogollonensis* and *M. m. navaho*), the Hualapai Mexican vole is of medium size, has long hind feet, and a pale dorsum.

The type locality for the Hualapai Mexican vole is in the Hualapai Mountains in Mohave County. There is an indication that other populations of voles outside of the Hualapai Mountains may be assignable to the taxon currently known as the Hualapai Mexican vole. However, Frey and Yates (1995) concluded that such taxonomic conclusions should be considered tentative because they are based on small samples.

Pending peer review of recent genetic studies, we consider only those voles in the Hualapai Mountains, which includes the action area, to be federally listed and subject to section 7 consultation. Additionally, we will continue to refer to the federally listed subspecies as Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*) until it is determined that a technical correction of the common and scientific name is appropriate according to our policies.

Life history

Very little life history information is available for this subspecies, therefore the recovery plan assumes the life history of the Hualapai Mexican vole is similar to that of the Mexican vole (*Microtus mexicanus*), where specified. Hualapai Mexican voles have been observed both day and night, and are likely active year-round, which is consistent with observations of other *Microtus* (U.S. Fish and Wildlife Service 1991). Signs of Hualapai Mexican vole presence include runways, burrow entrances, scat, and grass cuttings (Spicer *et al.* 1985, Kime *et al.* 1995). "Runways" are tunnel-like paths that go from one burrow entrance to another or to feeding or cutting sites among the grasses and are a distinctive vole sign. Runways average 1.4 inches in width and may run up to 16 or more feet with several side branches (Spicer *et al.* 1985). Currently, information regarding home range and activity areas is lacking. Based on capture patterns and the extensive, interconnected networks of runways, Spicer *et al.* (1985) believes the subspecies is colonial.

Microtus diets usually consist of green plant material when it is available. Observations from Hualapai Mexican vole runway surveys suggest that this subspecies has a typical vole diet of forbs and grasses (U.S. Fish and Wildlife Service 1991). Observation of bright green fecal

pellets during Hualapai Mexican vole surveys (Spicer *et al.* 1985, Boyett 2001) further supports this dietary hypothesis.

Reproductive characteristics of the Hualapai Mexican vole are assumed to be similar to those of other *M. mexicanus* subspecies, which have relatively small litters. Pregnant females of *M. mexicanus* are present, at least, from late spring through summer (U.S. Fish and Wildlife Service 1991). Limited data from New Mexico suggest that *M. mexicanus* has a “seasonally restricted” breeding period between May and November; however, pregnant *M. mexicanus* were captured in Coahuila, Mexico in January 1956 (Keller 1985). Keller (1985) suggests that the characterization of *M. mexicanus* as a seasonally restricted breeder should be tentative, pending further data. Acceptance of the proposed splitting of the Mexican and southwestern United states voles into *M. mexicanus* and *M. mogollonensis*, respectively, may further explain the difference in observations.

As of the date of the recovery plan, the Hualapai Mexican vole had been found between 5,397 and 8,399 feet in elevation in the Hualapai Mountains. Sites were within a band of about 4.0 miles from east to west and 15.0 miles from north to south, roughly centered along the main ridge of the mountain range. Most of the sites were somewhat clustered in two areas: several sites near the northern end of the distribution and a smaller group about 9.3 miles to the south. Vole habitat is very patchy and localized within this larger area, mostly in wash bottoms, near perennial water, or on north facing slopes. At the time the recovery plan was completed (following a somewhat dry period) the total area of known occupied habitat was believed to be as small as 314 acres.

The recovery plan states that *M. mexicanus* are generally associated with woodland forest types containing grasses and grass-sedge associations. The Hualapai Mexican vole was associated with moist grass-sedge areas along permanent or semi-permanent waters fed by springs or seeps in either open forest or chaparral. Good cover of grasses, sedges, and forbs is characteristic of this waterside vole habitat, which is found in narrow bands paralleling water courses.

The most recent status review and results of field surveys for the Hualapai Mexican vole provide additional information regarding its distribution and habitat (Kime *et al.* 1994, 1995; Boyett 2001). During 1990-1995, 66 Hualapai Mexican voles were captured or observed in 20 different specific sites (14 separate areas) of the Hualapai Mountains. Several of these were at or near known historical locations, but others were as far as 2.5-3.0 miles from previously known sites. Most of these new localities simply lowered the known elevational range or filled spatial gaps between previously known sites. The periphery of the overall range was extended no more than 1.0-2.0 miles in each of the four cardinal directions, making the total extent of the range approximately 7 by 18 miles. These surveys showed that the subspecies occurs at more sites and in slightly more varied habitat types within the Hualapai Mountains than was previously thought.

All vole habitat sites surveyed from 1991-1995 were within or very near the pine-oak vegetation belt (Kime *et al.* 1995). The pine-oak belt, in the Upper Sonoran life zone, is characterized as moderate in moisture supply, temperature, and soil conditions. Average annual precipitation is between 20.1 and 25.2 inches. Elevation typically ranges from 6,500 to 8,000 feet. Various

species of shrubs and grasses are common in the pine-oak belt. Four of the vole locations were lower than this range, and the actual range of elevation for the vole sites was 5,719 to 7,848 feet. The surveys conducted in 1991-1995 found that Hualapai Mexican voles in the Hualapai Mountains also use dry grassy areas on moderate to steep slopes with mainly north-facing aspects. Gambel oak was present at most capture sites and ponderosa pine (*Pinus ponderosa*) was present or in adjacent areas. New Mexican locust (*Robinea neomexicana*), mountain snowberry (*Symphoricarpos oreophilus*), and other plants were identified as frequently occurring at occupied habitat sites. Vole sites were also characterized by aspect, ranging from 290 to 114 degrees, and slope, ranging from zero to 41 percent (Kime *et al.* 1995).

The presence or absence of *Microtus* is likely determined by vegetation more than any other single environmental factor (Rose and Birney 1985). The presence of fairly dense grass cover is considered important, if not critical, for this subspecies. Boyett (2001) found a strong relationship between the local distribution of Hualapai Mexican voles and the microhabitat. He found that Hualapai Mexican voles were associated with areas in which understory trees and abundant grass, forb, and low shrub cover were present.

Population dynamics

Population levels of other *Microtus* fluctuate on annual and perennial cycles, and this is likely the case for Hualapai Mexican voles (U.S. Fish and Wildlife Service 1991). Hualapai Mexican vole cycles may correspond with precipitation and the resulting growth of vegetation (Spicer *et al.* 1985). To date, estimations of population sizes and/or stability have not been made or are not available.

Status and distribution

The factors for listing the subspecies included its rarity and restricted habitat along with threats posed by (1) drought; (2) elimination of ground cover (grasses, sedges, rushes, and forbs) around open water and seeps primarily due to grazing and human recreation (e.g., camping and off-road vehicle activities); (3) water development; and (4) activities that cause or exacerbate erosion (e.g., road construction, overuse by livestock, concentrated recreation).

In 1998, survey results suggested that Hualapai Mexican vole populations are capable of increasing rather rapidly in response to favorable rainfall. After abundant rainfall in the winter of 1997-1998, Hualapai Mexican voles were documented at several new localities, including some in habitats not previously considered to be typical for the vole (e.g., shrub dominated areas and areas with no woody vegetation), and were more easily observed than in prior years (R. Winstead, Arizona Game and Fish Department, pers. comm. 2001). Boyett (2001) confirmed the continued presence of Hualapai Mexican voles in the Hualapai Mountains through trapping or visual observation at seven study sites as well as observation of voles or vole sign at a minimum of 12 additional sites that were not trapped. As with previous observations (Getz *in* Tamarin 1985, Spicer *et al.* 1985, Kime *et al.* 1995), Boyett (2001) found Hualapai Mexican voles in both

xeric and mesic areas, such as open grass-shrub covered slopes and grass-sedge vegetation along drainages, respectively.

Most known Hualapai Mexican vole habitat is now excluded from grazing. Near the northern end of the vole's distribution, there is no permitted livestock grazing in an area comprising about ten sections of BLM, Mohave County (Hualapai Mountain County Park), and private land that encompasses nearly half of all known sites, and probably more than half of the total area of known habitat. An approximately 2200-acre exclosure protects a cluster of sites at Pine Flat, an area of fairly heavy recreational use. A 10-acre exclosure in Crow Canyon protects the southernmost known locality. An exclosure using natural barriers and fencing is intended to preclude livestock access to vole habitat on and around Pine Peak. Preliminary monitoring indicates that this partial exclosure has been effective at excluding livestock. A small exclosure at Grapevine Canyon protects vole habitat on the western side of the Hualapai mountains. On the Yellow Pine Allotment, BLM has installed a small exclosure around Jeep Spring and a small exclosure using natural barriers and fencing protecting habitat above Jeep Spring. The BLM has also constructed an exclosure at Moss Wash, 2 small exclosures near Yellow Pine Spring, and a small exclosure using natural barriers and fencing at Blue Tank Spring. On the Yellow Pine Allotment, 2 known Hualapai Mexican vole localities at Sugarbowl Tank and Timber Wash are currently open to livestock grazing. No livestock utilization in vole habitat has been detected in these areas. Outside of the Yellow Pine Allotment, 2 known Hualapai Mexican vole localities are currently open to livestock grazing. These are at Dean Peak (the northernmost known locality, on Arizona State Trust land) and Wabayuma Peak (the westernmost known locality, within a BLM wilderness area).

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 from which assess the effects of the action now under consultation.

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). We have determined the action area for the proposed action to include the Hayden Peak Road from the locked gate west of Recreation Site #3 up to the end of the road at the Hayden Peak Communications Site, the spur roads up to communications sites Potato Patch I and Potato Patch II, and all areas adjacent to these roads out to a distance of 30 feet. We base this determination on the maximum distance from the road that 1) erosional and depositional effects of runoff have been observed by BLM staff, and 2) disturbance impacts to voles are anticipated to be significant.

The Park was established by Congress in 1939. The Hayden Peak Road was originally constructed around 1955 for the purpose of providing access to proposed communications sites in the northern Hualapai Mountains. The communications sites were initially installed between 1955-1956. Approximately 23 organizations currently hold rights-of-way to use the road for installing and maintaining communications equipment at the sites involved. Title for the communications sites properties was transferred from the Park to the BLM in 1984. Vehicular access to the road is restricted, via a locked gate, to members of the Users Association, and to Boy Scout troops and other parties using Camp Levi Levi on an infrequent basis. The locked gate is managed by the Park, and will likely remain locked due to vandalism concerns at the communications sites.

On August 26, 2003, approximately 2 inches of rain fell on the Hualapai Mountains over a very brief period. This event washed out a section the Hayden Peak Road approximately one-half mile up from the locked gate within potential vole habitat. The Users Association brought in fill to repair the washout shortly after the event. On September 4, 2003, another 4 inches of rain fell on the Hualapai Mountains causing a washout in the same location. These events were classified by BLM staff as 10-year and 50-year or greater flood events (respectively). The Users Association has brought in more fill to the site to make it passable to vehicles, and is planning on installing additional erosion control structures to prevent future erosion problems at this site.

Status of the species within the action area

The presence of voles adjacent to the Hayden Peak Road was recently observed in March and August, 2003. There are two known Hualapai Mexican vole locations within the action area, identified on Map 1. This is approximately eight percent of all documented localities. A third site identified on Map 1 on the west side of the road is approximately 75 feet from the edge of the road. The BLM has identified (but not quantified) several areas of suitable vole habitat within the action area along the upper portion of the road. In addition, the BLM has identified nearly the entire route as potential vole habitat. It is not possible to estimate the percentages of total habitat area or total number of voles within the action area because the total number of inhabited sites remains poorly known, total habitat area has not been measured at most known sites, and population sizes have not been measured and are apparently highly variable.

Hualapai Mexican voles have been found inhabiting the mixed-conifer forest community in the Hualapai Mountains. The community occurs along the entire length of the action area, and is dominated by Ponderosa Pine with occasional Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), and small groves (< one-quarter of an acre) of quaking aspen (*Populus tremuloides*). The community occurs on the northern edge of the Hualapais on the north and east facing slopes of the highest peaks. The action area includes vole habitat in the northern portion of the vole's overall range. We estimate that less than one percent of the vole's overall range of approximately 7 by 18 miles occurs within the action area.

Factors affecting the species' environment within the action area

Approximately 9.1 acres of vole habitat where the Hayden Peak Road now exists were eliminated by the construction of the road. Vole habitat adjacent to the road continues to be influenced by road use and maintenance activities, as well as the presence of the road itself. The road alters the flow of precipitation downslope, artificially channeling water down the road where it gains velocity and is then diverted off the road where water bars have been constructed. This causes localized erosion and/or sediment deposition that may degrade or destroy vole habitat. The number of water bars on the upper portion of the road is currently insufficient to handle the volume of water the area receives during summer rain events. Where water is diverted off of the road surface, the potential for erosion and sedimentation, and loss of vole habitat, is increased over pre-road conditions. Some existing water bars on the Hayden Peak Road exhibit little sediment deposition or erosion gulying below the road. Others exhibit sediment deposits up to 8 feet wide by 30 feet long. Some have created erosion gullies that are approximately 10 inches deep by 2 feet wide by 30 feet long. The total area of vole habitat lost due to sedimentation and erosion has not been quantified by BLM.

The presence of the road provides access to non-motorized recreational activities which have the potential to disturb voles and may reduce their use of roadside habitat. Although vehicular use and maintenance activities are infrequent, these activities also have the potential to reduce the use of roadside habitat by voles.

The road results in habitat fragmentation in addition to potential vole mortality from vehicle encounters. Roads also promote the spread of undesirable weedy plants through an area that may affect food availability. Dust from road maintenance and vehicle traffic may inhibit growth of vegetation in roadside vole habitat.

Portions of the Boy Scout Camp Levi Levi occur within the action area. Recreational activities at Camp Levi Levi have caused degradation of vole habitat through trampling and cutting of vegetation, and camp activities likely cause noise disturbance to voles.

Population levels of other *Microtus* fluctuate on annual and perennial cycles, and it is likely the case for Hualapai voles (U.S. Fish and Wildlife Service 1991). Hualapai vole cycles may correspond with precipitation and the resulting growth of vegetation (Spicer *et al.* 1985). Effects of recent drought conditions throughout the Southwest may have reduced vole numbers within the action area.

The BLM manages approximately 27 percent of the action area, and is a member of the Users Association. The BLM is also the lead Federal agency regarding ESA compliance; therefore, all activities that may affect Hualapai Mexican voles or their habitat within the action area are considered Federal actions, with the exception of activities occurring at the Boy Scout Camp Levi Levi. The following provides a summary of the section 7 consultations regarding the Hualapai Mexican vole within the action area.

On March 8, 1991, we issued a biological opinion (consultation number 02-21-91-F-0089) on the BLM Kingman Resource Area Resource Management Plan (RMP) and its effects on the vole and other listed species. The RMP is a 20-year guide for management directions and programs within the resource area. On September 11, 1995, we issued a concurrence (consultation number 02-21-95-I-0401) on the BLM Kingman Field Office 5-Year Hayden Peak Communications Site Road Maintenance Plan and its effects on the Hualapai Mexican vole and other listed species. On December 14, 2001, we issued a biological opinion (consultation number 02-21-01-F-0241) on the BLM Kingman Field Office Prescribed Fire Program within the Field Office boundaries and its effects on the Hualapai Mexican vole.

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.

Direct and indirect effects

Erosion and Sedimentation

The USFS Method is expected to be the first used on the Hayden Peak Road and would direct water from the road into more areas of vole habitat than presently occurs due to the construction of additional water bars. It is estimated that no more than 150 water bars will be constructed. These additional water bars will be maintained under all methods of road maintenance throughout the life of the project. Water draining from the road would be expected to have the greatest erosional and depositional effects during the summer. Summer rainfall typically comes in short, violent bursts. These types of events typically cause the most erosion (overland flow) as a high amount of water falls on bare ground in a short period of time. During these events, water flowing off the road causes localized erosion and/or sediment deposition which potentially degrades or destroys vole habitat below the road. The steepness of the upper portion of the road exacerbates this effect. Winter storms typically produce less destructive erosion forces as winter rainfall tends to be lighter and falls over a longer period of time. Because of the increased frequency of water bars within vole habitat, the frequency of areas where sediment deposition or erosion channeling occurs within vole habitat may increase. Voles may abandon or reduce their use of roadside habitat due to this habitat loss and/or degradation. Reduced habitat quantity or quality can result in increased predation of the vole and reduced foraging opportunities, with subsequent reduced reproductive output and/or increased mortality.

Installing water bars at a higher frequency than what currently exists on the road is anticipated to slow down water velocity and reduce water volume, sediment transport, and the particle size that

can be transported. The BE indicates that the increase in water bar frequency is anticipated to reduce the size of depositional deposits by up to one-quarter. A minor amount of vole habitat may be lost due to the installation of nickpoint armoring within vole habitat. The armoring is anticipated to eliminate or reduce the size of erosional channels due to reduced erosional forces. Careful placement of water bars would minimize drainage into occupied, suitable, and historical vole habitat, and would minimize erosion and deposition damage of habitats.

The Original Method of road maintenance may involve the removal of large rocks imbedded in the roadbed, which creates holes that must be filled, resulting in a less stable road surface. A less stable road surface may result in greater sediment movement and therefore larger amounts of sediment *overall* being deposited onto adjacent vole habitat. Sedimentation caused by road runoff is anticipated to increase during the first 3 years following either the Original Method or the USFS Method. The USFS Method is expected to result in less follow-up maintenance than the Original Method due to improved roadbed integrity. This would result in less erosion and degradation of the road and less sediment deposit into adjacent vole habitat over the life of the project. Less maintenance activity would also mean less noise disturbance to voles caused by heavy equipment.

Emergencies such as major wash-outs and rock falls that make the road impassable may require maintenance during wet road conditions. This maintenance is expected to occur infrequently, but could result in road degradation. Most road maintenance activities would occur after the summer rains, during dry conditions when heavy equipment is less likely to damage the road.

Disturbance Effects

Voies may be adversely affected by noise and vibration caused by road equipment. Little is known about the effects of vibration caused by road maintenance activities on mammals and are herein considered similar to that of noise. The BE indicates that noise from maintenance equipment is similar to the noise created by a diesel truck. The BE further states that a diesel truck on a busy urban street has a combined decibel (dBa) level of 90. It is estimated that voles living immediately adjacent to the road would be exposed to this decibel level for up to 45 minutes, as this is the maximum amount of time it takes to complete maintenance on a 60-foot length of road. The BE noted that the hearing of kangaroo rats (*Dipodomys deserti*) exposed to 95 dBa of noise for 500 seconds at 8 centimeters was seriously impaired and affected their ability to detect the approach of predators in the dark for up to 21 days after their exposure. Using the kangaroo rat as a surrogate species for Hualapai Mexican voles, it could be postulated that the maintenance of this road with heavy equipment could affect the vole as described above. However, *Dipodomys* ears are anatomically adapted to amplify low-frequency sounds. These adaptations include their enlarged auditory bullae. The BE indicated that the auditory bullae of *Microtus* do not match the outsized proportions seen in many gerbillines (animals similar to kangaroo rats in morphology and habitat preference as kangaroo rats). The impacts of noise on Hualapai Mexican voles created by the heavy machinery may be similar to kangaroo rats, however it is anticipated to be less than that found for *D. deserti*. It is anticipated that voles within the vicinity of the working heavy equipment would attempt to move away from the noise

or go underground to reduce their exposure to the noise. If voles are disturbed to such an extent that they abandon their home territory, they could be exposed to increased levels of predation and stress.

The reproductive success of Hualapai Mexican voles may be adversely affected by the road equipment noise. The BE noted that mice exposed for 4 hours a day to the noise of a subway car were found to have abnormalities, low weight, and uterine resorption. Hualapai Mexican voles would be exposed for a shorter time (maximum of 45 minutes) to equipment noise during maintenance activities than the mice above and may move away from the noise. In addition, most road maintenance activities would occur outside of the vole's peak breeding season. Although voles are not seasonally restricted breeders (they can breed any time of the year when vegetation green-up occurs), they have been most frequently observed pregnant between April 1 and September 30. Only emergency road maintenance would occur during this time and is expected to occur infrequently in isolated locations and to be of short duration.

Explosives and pneumatic hammers may be used to remove large hazard rocks or install culverts and other flood control structures. These activities are not anticipated to affect voles as they will not be conducted within suitable habitat and will not occur within one-quarter mile of occupied vole habitat.

Effects of recent drought conditions throughout the Southwest may have reduced vole numbers within the action area, therefore reducing the ability of the population to recover from disturbance. The low frequency of disturbance (no more than once per year) from the proposed action may allow vole populations time to recover and persist in the face of infrequent disturbances.

Other Effects to Voles and Their Habitat

Maintenance equipment poses a risk to any voles in the immediate vicinity. Project vehicles and equipment could egress into areas outside the road footprint and destroy habitat or kill or injure voles. Voles could also be killed or injured from encounters with maintenance equipment on the road itself. However, the slow speed of maintenance equipment on the road, the vole's ability to avoid encounters with vehicles, and the vole's reclusive nature significantly reduce this likelihood. Road maintenance may unintentionally widen the road, causing permanent loss of roadside vole habitat. It is anticipated that up to 12 inches of slough may be left on the edges of the road and may slough into vole habitat adjacent to the road. Dust from road maintenance may inhibit growth of roadside vegetation within vole habitat, although the infrequency of maintenance would likely allow the vegetation to recover. The use of material borrow sites is not anticipated to affect voles, as no borrow sites proposed for use are within vole habitat. The road equipment does not produce flying material and is thus not anticipated to affect vole habitat. Use of the Communications Sites Road is limited to high clearance and 4-wheel drive vehicles and is limited by a locked gate to members of the Users Association, and to Boy Scout troops and other parties using Camp Levi Levi. Vehicular use of this road is not expected to increase as a result of the proposed action.

Interrelated and interdependent actions

No interrelated or interdependent actions have been identified for the proposed action.

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.

The BLM expects recreational use of the Hualapai Mountains to increase slightly in the future. The BLM has management authority and responsibility for recreational impacts on the lands they manage. However, recreational impacts in the Park may affect the Hualapai Mexican vole as well and may not be related to any Federal action. Although public vehicular access to the Hayden Peak Road is not expected to increase due to the presence of a locked gate at the base of the road considered in this proposed action, non-vehicular recreational access may be expected to increase slightly (< 5 percent) over time due to improved road conditions (stabilization of the roadbed and its associated shoulders and adjacent habitat, resulting in a more dependable and more passable road). These activities will have effects similar to those stated in the environmental baseline.

CONCLUSION

After reviewing the current status of the Hualapai Mexican vole, the environmental baseline for the action area, the effects of implementation of the proposed action and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Hualapai Mexican vole. No critical habitat has been designated for this species, therefore, none will be affected.

We base this conclusion on the following considerations:

1. The number of Hualapai Mexican voles anticipated to be affected by the proposed action is not expected to have a significant effect on the species' overall numbers, distribution, or reproductive potential.
2. The direct and indirect effects of the proposed action have been minimized through project conservation measures.
3. The proposed action is likely to reduce the impacts of the Hayden Peak Road on adjacent vole habitat.

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

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is 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, and 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 and 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 measure described below is non-discretionary, and must be undertaken by the BLM so that it becomes a binding condition of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (1) fails to assume and implement the terms and conditions or (2) 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, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the BLM must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

We anticipate that the proposed action will result in incidental take of Hualapai Mexican voles through harm resulting from habitat loss and/or degradation, and harm due to noise disturbance that may also result in reduced reproductive output. Take will be difficult to detect for the following reasons: 1) voles have small body size; 2) finding a dead or impaired specimen is unlikely; 3) losses may be masked by seasonal or year-to-year fluctuations in numbers; and 4) the

species occurs in habitat that makes detection difficult. As a result, we provide surrogate measures to establish when incidental take is exceeded:

- 1) Road maintenance equipment leaves the road footprint and damages or destroys vole habitat;
- 2) one (1) vole is killed or injured as a result of an encounter with maintenance equipment;
- 3) more than 150 water bars are constructed;
- 4) greater than 27,000 square feet of suitable, occupied, potential, and/or historical vole habitat are degraded or destroyed annually throughout the action area due to erosional and/or depositional effects of water draining off the road; and
- 5) greater than 240 square feet of suitable, occupied, potential, and/or historical vole habitat are degraded or destroyed annually in any one site due to erosional and/or depositional effects of water draining off the road. Potential habitat is included in surrogate measures 4 and 5 because we believe that it is likely to develop into suitable and/or occupied habitat within the life of the project. We base this on the longevity of the project (24 years), the connectivity of potential habitat within the action area with currently suitable and occupied habitat, and the ability of the vole's habitat requirements to develop within the life of the project if given the appropriate physical and climatic conditions, and management actions.

The levels of take provided above represent our best assessment based on the best scientific and commercial data available to us. As we develop more information about how road maintenance affects voles, and as surveys are completed for voles and their habitat within the action area, these anticipated levels of take may be revisited. Refer to the Effects of the Proposed Action section for further supporting information on why we anticipate take in the forms and levels provided here.

If, during the course of the action, the amount or extent of incidental take authorized by this opinion is exceeded, you must immediately reinitiate consultation with us to avoid a violation of section 9 of the Act. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the 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 this office.

EFFECT OF THE TAKE

In this biological opinion we determined that this level of anticipated take is not likely to result in jeopardy to the species.

REASONABLE AND PRUDENT MEASURE/TERMS AND CONDITIONS

We believe the following reasonable and prudent measure and associated terms and conditions are necessary and appropriate to minimize take of the Hualapai Mexican vole.

1. The BLM shall develop and implement habitat monitoring to detect when the anticipated level of incidental take is exceeded.
 - a. The BLM will develop and implement an annual, standardized monitoring protocol capable of detecting a decline in habitat quality and quantity for the purposes of determining when the anticipated level of incidental take is approached or exceeded. Parameters measured will include erosion and sedimentation below a subset of water bars. This monitoring protocol shall be developed in conjunction with us, and will be completed within one year of the date of this opinion.
 - b. The BLM shall transmit annual monitoring reports to this office by February 1 of each year. The reports will briefly document for the previous calendar year the collected data on the selected habitat parameters and make recommendations for revising these terms and conditions to make them more protective of the species, more reflective of habitat conditions, and/or less restrictive on BLM activities.

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. BLM must immediately provide an explanation of the causes of the taking and review with us 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 our Law Enforcement Office, 2450 West Broadway Road, Suite 113, Mesa, Arizona 85202 (telephone: 480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to

minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that your agency work with the Users Association to avoid use of the road when saturated to the extent at which damage would occur (i.e., rutting).
2. We recommend that your agency work with the Users Association to develop a follow-up monitoring program to determine how increased water bars impact vole habitat adjacent to the road.
3. We recommend that your agency work with the Users Association to schedule road maintenance during years of below-average precipitation, due to the strong correlation between annual precipitation and vole densities.
4. We recommend that your agency work with the Users Association to assist the Boy Scout Camp Levi Levi in reducing their impact to Hualapai Mexican voles and their habitat within the camp.
5. We recommend that monitoring currently known, and searching for possible new, locations and populations of Hualapai Mexican voles should be continued and/or funded by the BLM in the Hualapai Mountains. Annual monitoring of all known and future locations would provide long-term data regarding such parameters as activity of the sites and relative numbers of voles at monitored locations. Such information would be valuable for future section 7 consultations as well as overall recovery of the species.

In order that we be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on reinitiation of the Hayden Peak Communications Sites Road Maintenance Plan on the Hualapai Mexican vole. 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.

We appreciate BLM's efforts to identify and minimize effects to listed species from this project. For further information please contact Allen Taylor (x105) or Brenda Smith (x101) of our Flagstaff Suboffice at (928) 226-0614. Please refer to the consultation number, 02-21-95-F-0401-R1, in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
Jennifer Graves, Fish and Wildlife Service, Phoenix, AZ
Rebecca Peck, Kingman Field Office, BLM, Kingman, AZ

John Kennedy, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

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