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In Reply Refer to:
AESO/SE
22410-2010-F-0410

November 15, 2011

Glenn Frederick
Acting District Ranger
Sierra Vista Ranger District
Coronado National Forest
5990 South Highway 92
Hereford, Arizona 85615

RE: Helicopter Landing Zones in the Huachuca and Patagonia Mountains, Santa Cruz and Cochise Counties, Arizona

Dear Mr. Frederick:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was the result of discussions between our respective supervisors (Jim Upchurch and Steve Spangle) in May 2011; the initial letter was received by us on April 15, 2011. At issue are the effects of the proposed maintenance and/or construction of nine (9) helicopter landing zones in the Huachuca and Patagonia Mountains in Santa Cruz and Cochise counties, Arizona.

You have concluded that the proposed action may adversely affect the threatened Mexican spotted owl (*Strix occidentalis lucida*) and the species' critical habitat. You have also requested concurrence that the proposed action is not likely to adversely affect the endangered jaguar (*Panthera onca*), the endangered ocelot (*Felis pardalis*), and the endangered lesser long-nosed bat (*Leptonycteris yerbabuenae*). We concur with your determination and have provided our rationales in Appendix A.

This biological opinion (BO) is based on information provided in:

(1) your April 2001 Biological Assessment;

(2) meetings, electronic mail exchanges, and telephone conversations between our respective staffs; and

(3) other published and unpublished sources of information. A complete administrative record of this consultation is on file at this office.

Please note that this biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete our analysis with respect to Mexican spotted owl critical habitat.

Consultation History

Portions of the proposed action have been discussed intermittently between 2008 and the present. The following consultation history includes only the exchange of appreciable amounts of information (i.e. project negotiation, transmittal of documents, etc.).

October 30, 2008: Our respective staffs met to discuss Department of Homeland Security, Customs and Border Protection's (CBP) desire to operate from four helipads in the Miller Peak Wilderness in the Huachuca Mountains.

May 12, 2010: Your staff transmitted an electronic version of a draft BA for a Landing Zone in the Patagonia Mountains near Italian Canyon

June 2, 2010: Our staffs discussed a proposal to discuss the construction and operation of six new helipads in the Patagonia Mountains.

February 7, 2011: Our staffs discussed the currently-proposed action (six new helicopter landing zones (LZ) in the Patagonia Mountains and the maintenance of three existing helicopter LZs in the Huachuca Mountains).

April 15, 2011: Your staff provided us with an electronic version of a draft BA, which requested concurrence that the proposed action was not likely to adversely affect threatened or endangered species.

April 21, 2011: Your staff provided us with an electronic version of the final BA for the proposed action analyzed herein.

May 16 – 19, 2011: Field Supervisor Steve Spangle and Forest Supervisor Jim Upchurch discussed, and agreed upon, the need for formal consultation on the proposed action's effects to Mexican spotted owls.

June 13, 2011: We transmitted a request that your agency seek formal consultation on the proposed action's effects to Mexican spotted owls.

June 23, 2011: The draft first revision to Mexican Spotted Owl Recovery Plan was released.

June 28, 2011: We met with your and other agencies' staffs to discuss the effects of the Monument Fire, which encompassed the portion of the proposed action in the Huachuca Mountains.

August 23, 2011: We transmitted a draft BO to you.

October 21, 2011: We received your October 19, 2011, letter transmitting your and CBP's comments on the August 23, 2011, draft BO.

BIOLOGICAL OPINION

Description of the Proposed Action

A complete description of the proposed action is found in your BA is summarized below.

The proposed action includes the construction of six (6) new helicopter LZs in the Patagonia Mountains and the maintenance of three (3) existing helicopter LZs in the Huachuca Mountains (see Figures 1 and 2 in the BA). Both construction of new LZs and maintenance of existing LZs will require clearing an approximately 125-feet diameter circle (0.3 acre) of vegetation using hand tools and chain saws, except in the Miller Peak Wilderness where only hand tools would be used. Total area cleared of vegetation would not exceed 3 acres. Sites would be accessed from existing roads and trails. No new roads or trails would be constructed to support the landing zones.

The nine landing zones would be used by the Forest Service and Border Patrol for emergencies, including but not limited to wildland fire suppression, extraction of injured persons and insertion of law enforcement agents. Each landing zone could be used as many as eight (8) times per year. Each use would consist of a single landing and take-off. Helicopter flight elevation would be above 345 feet (105 meters) except during landing and take-offs. No end date was proposed; it is assumed that the helipads will be used for an indefinite period of time.

Conservation measures are proposed in order to avoid or minimize adverse effects to the species identified in Table 1 in the BA. The following conservation measures are part of the proposed action.

- The perimeter of all areas to be disturbed during construction or maintenance activities will be clearly demarcated with flagging or temporary construction fence. Disturbance outside this perimeter will not be allowed.

- Construction and maintenance of each LZ will occur during daylight.
- No permanent or temporary road construction shall occur for construction, use or maintenance of each LZ.
- No equipment, materials, fuel or other products associated with construction and maintenance of each LZ shall be stored on-site.
- Noise at each LZ associated with its construction, maintenance, and use should be limited to the minimum needed to achieve operational purposes.
- Each LZ will be used up to 8 times per year.
- Helicopter flight elevation will be above 345 feet (105 meters) except during landing and take-off.
- LZs are or will be at least 1,320 feet (0.25 mile) from any known occupied Mexican spotted owl roosting or nesting area (referred to in the BA as a restricted activity center).

Status of the Species

The Mexican spotted owl was listed as a threatened species in 1993 (FWS 1993). The primary threats to the species were cited as even-aged timber harvest and stand-replacing wildland fire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the Mexican spotted owl population. The FWS appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) in 1995 (FWS 1995). The Recovery Team prepared the draft first revision to the Recovery Plan in 2011 (FWS 2011; Draft Revised Recovery Plan). Critical habitat was designated for the Mexican spotted owl in 2004 (FWS 2004).

A detailed account of the taxonomy, biology, and reproductive characteristics of the Mexican spotted owl is found in the Final Rule listing the Mexican spotted owl as a threatened species (FWS 1993) and in the Recovery Plan (FWS 1995). The information provided in those documents is included herein by reference. Although the Mexican spotted owl's entire range covers a broad area of the southwestern United States and Mexico, the Mexican spotted owl does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, uneven-aged forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.

The United States range of the Mexican spotted owl has been divided into six recovery units (RU), as discussed in the 1995 Recovery Plan. The primary administrator of lands supporting the Mexican spotted owl in the United States is the Forest Service. Most owls have been found within Forest Service Region 3 (which includes 11 National Forests in Arizona and New Mexico). Forest Service Regions 2 and 4 (which includes two National Forests in Colorado and three in Utah) support fewer owls. According to the 1995 Recovery Plan, 91 percent of Mexican spotted owl known to exist in the United States between 1990 and 1993 occurred on lands administered by the Forest Service.

The U.S. range of the Mexican spotted owl was divided into six recovery units (RU) by the 1995 Recovery Plan. In the Draft Revised Recovery Plan, we renamed RUs as Ecological Management Units (EMUs). The Mexican spotted owl's range in the U.S. was divided into five such EMUs. National Forest System lands contain the most Mexican spotted owls; the 2011 Draft Recovery Plan Revision states that 82.8 percent (1,077 of 1,301 sites) of Mexican spotted owls known to exist in the United States occur on lands administered by the Forest Service.

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

Currently, high-intensity, stand-replacing fires are influencing ponderosa pine and mixed conifer forest types in Arizona and New Mexico. Uncharacteristic, high-severity, stand-replacing wildland fire is probably the greatest threat to Mexican spotted owl within the action area. As throughout the West, fire severity and size have been increasing within this geographic area. Landscape level fires, such as the Rodeo-Chediski Fire (2002) and currently the Wallow Fire (2011), have resulted in the loss of thousands of acres of occupied and potential Mexican spotted owl habitat across significant portions of its range.

Global climate variability may also be a threat to the Mexican spotted owl and synergistically result in increased effects to habitat from fire, fuels reduction treatments, and other factors discussed above. Studies have shown that since 1950, the snowmelt season in some watersheds of the western U.S. has advanced by about 10 days (Dettinger and Cayan 1995, Dettinger and Diaz 2000, Stewart *et al.* 2004). Such changes in the timing and amount of snowmelt are thought to be signals of climate-related change in high elevations (Smith *et al.* 2000, Reiners *et al.* 2003). The impact of climate change is the intensification of natural drought cycles and the

ensuing stress placed upon high-elevation montane habitats [Intergovernmental Panel on Climate Change (IPCC) 2007, Cook *et al.* 2004, Breshears *et al.* 2005, Mueller *et al.* 2005]. The increased stress put on these habitats is likely to result in long-term changes to vegetation, invertebrate, and vertebrate populations within coniferous forests and canyon habitats that affect ecosystem function and processes.

A reliable estimate of the numbers of owls throughout its entire range is not currently available (FWS 1995) and the quality and quantity of information regarding numbers of Mexican spotted owl vary by source. FWS (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. However, Ganey *et al.* (2000) estimated approximately 2,950 ± 1,067 (SE) Mexican spotted owls in the Upper Gila Mountains RU alone. The Forest Service Region 3 most recently reported a total of approximately 1,065 PACs established on National Forest System (NFS) lands in Arizona and New Mexico (U.S. Forest Service, 2011 Land and Resource Management Plan Biological Assessment, pg. 41). The FS Region 3 data are the most current compiled information available to us; however, survey efforts in areas other than NFS lands have resulted in additional sites being located in all RUs and now, EMUs

Before proceeding, we shall define certain terms used repeatedly in discussions of the management of spotted owls. A PAC is a 600-acre polygon surrounding a 100-acre core area which, in turn surrounds the known or most-likely roost site. In addition to the transition from RUs to EMUs, the Draft Revised Recovery Plan has the term *owl site*, which is an area used repeatedly by a single or a pair of owls for nesting, roosting, or foraging.

Researchers studied Mexican spotted owl population dynamics on one study site in Arizona (n = 63 territories) and one study site in New Mexico (n = 47 territories) from 1991 through 2002. The Final Report, titled "Temporal and Spatial Variation in the Demographic Rates of Two Mexican Spotted Owl Populations" (Gutierrez *et al.* 2003), found that reproduction varied greatly over time, while survival varied little. The estimates of the population rate of change (Λ=Lambda) indicated that the Arizona population was stable (mean Λ from 1993 to 2000 = 0.995; 95 percent Confidence Interval = 0.836, 1.155) while the New Mexico population declined at an annual rate of about 6 percent (mean Λ from 1993 to 2000 = 0.937; 95 percent Confidence Interval = 0.895, 0.979). The study concludes that spotted owl populations could experience great (>20 percent) fluctuations in numbers from year to year due to the high annual variation in recruitment. However, due to the high annual variation in recruitment, the Mexican spotted owl is then likely very vulnerable to actions that impact adult survival (e.g., habitat alteration, drought, etc.) during years of low recruitment.

Since the owl was listed, we have completed or have in draft form a total of 229 formal consultations for the Mexican spotted owl. These formal consultations have identified incidences of anticipated incidental take of Mexican spotted owl in 439 PACs over the course of 18 years. The form of this incidental take is almost entirely harm or harassment, rather than direct mortality, and many of these actions have resulted in single or short-term disturbance to owls that has not resulted in long-term harassment, habitat degradation, or habitat loss. These

consultations have primarily dealt with actions proposed by Forest Service Region 3. However, in addition to actions proposed by Forest Service Region 3, we have also reviewed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military and sightseeing overflights, and other activities. Only two of these projects (release of site-specific owl location information and existing forest plans) have resulted in biological opinions that the proposed action would likely jeopardize the continued existence of the Mexican spotted owl. The jeopardy opinion issued for existing Forest Plans on November 25, 1997 was rendered moot as a non-jeopardy/no adverse modification BO was issued the same day.

In 1996, we issued a biological opinion on FS Region 3 adoption of the Recovery Plan recommendations through an amendment to their Land and Resource Management Plans (LRMPs). In this non-jeopardy biological opinion, we anticipated that approximately 151 PACs would be affected by activities that would result in incidental take of Mexican spotted owls. In addition, on January 17, 2003, we completed a reinitiation of the 1996 Forest Plan Amendments biological opinion, which anticipated the additional incidental take of five Mexican spotted owl PACs in Region 3 due to the rate of implementation of the grazing standards and guidelines, for a total of 156 PACs. Consultation on individual actions under these biological opinions anticipated incidental take in the form of harm and/or harassment of owls associated with 243 PACs on Region 3 NFS lands. FS Region 3 reinitiated consultation on the LRMPs on April 8, 2004. On June 10, 2005, the FWS issued a revised biological opinion on the amended LRMPs. We anticipated that while the Region 3 Forests continue to operate under the existing LRMPs, take is reasonably certain to occur to an additional 10 percent of the known PACs on NFS lands. We expect that continued operation under the plans will result in harm to 49 PACs and harassment to another 49 PACs. To date, consultation on individual actions under the amended Forest Plans, as accounted for under the June 10, 2005, biological opinion, has resulted in the incidental take of owls associated with 52 PACs over approximately five years. However, because some of this incidental take has been in the form of short-term harassment that has occurred and is no longer on-going, we are continuing to track incidental take in 45 PACs associated with actions covered under the 2005 LRMP BO (21 harm, 24 harass). Prior to the 2011 fire season, incidental take associated with Forest Service fire suppression actions, which was not included in the LRMP proposed action, had resulted in the incidental take of owls associated with 27 PACs (6 harm, 21 harassment).

Mexican spotted owl critical habitat

The final Mexican spotted owl critical habitat rule (FWS 2004) designated approximately 8.6 million acres of critical habitat in Arizona, Colorado, New Mexico, and Utah, mostly on Federal lands (FWS 2004). Within this larger area, critical habitat is limited to areas that meet the definition of protected and restricted habitat, as described in the Recovery Plan. Protected habitat includes all known owl sites and all areas within mixed conifer or pine-oak habitat with

slopes greater than 40 percent where timber harvest has not occurred in the past 20 years. Restricted habitat includes mixed conifer forest, pine-oak forest, and riparian areas outside of protected habitat.

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

Primary constituent elements related to forest structure include:

- A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 percent to 45 percent of which are large trees with diameter-at-breast height (dbh) of 12 inches or more;

- A shade canopy created by the tree branches covering 40 percent or more of the ground; and,

- Large, dead trees (snags) with a dbh of at least 12 inches.

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

- High volumes of fallen trees and other woody debris;

- A wide range of tree and plant species, including hardwoods; and

- Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration.

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

- Presence of water (often providing cooler and often higher humidity than the surrounding areas);

- Clumps or stringers of mixed-conifer, pine-oak, pinyon-juniper, and/or riparian vegetation;
- Canyon wall containing crevices, ledges, or caves; and,
- High percent of ground litter and woody debris.

Steep-walled rocky canyonlands are typically within the Colorado Plateau (CP) RU, but also occur in other RUs. Canyon habitat is used by owls for nesting, roosting, and foraging and includes landscapes dominated by vertical-walled rocky cliffs within complex watersheds, including many tributary side canyons. These areas typically include parallel-walled canyons up to 1.2 miles (2 kilometers) in width (from rim to rim), with canyon reaches often 1.2 miles (2 kilometers) or greater in length, and cool north-facing aspects. Rock walls must include caves, ledges, and fracture zones that provide protected nest and roost sites. Breeding sites are located below canyon rims; however, it is known that owls use areas outside of the canyons (i.e., rims and mesa tops).

Environmental Baseline

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

The action area includes the areas that will be directly and indirectly affected by the construction of six new LZs in the Patagonia Mountains and the maintenance of three existing, but overgrown LZs in the Huachuca Mountains as well as surrounding habitat (including PACs and critical habitat).

The action area is within the Basin and Range West unit of Mexican spotted owl critical habitat. Critical habitat within the Basin and Range-West EMU is disjunct, a function of its presence in the Sky Islands of southeastern Arizona and southwestern New Mexico. Moreover, the Madrean Evergreen Woodland component of the critical habitat is unique. Thus, while the fraction of critical habitat within the action area is small relative to the Recovery Unit and the total amount of critical habitat available, the unique habitat associations render it crucial to the recovery of the Mexican spotted owl. The critical habitat present within the action area is functioning for the recovery of the species although, like the EMU, it exists under threat of catastrophic wildfire, recreation, and grazing. The focus of Mexican spotted owl management is at the scale of a PAC, not a critical habitat unit.

Specific information on each LZ is provided in the following narrative:

Patagonia Mountains

The Patagonia Mountains extend south from Sonoita Creek approximately 15 miles to the U.S. - Mexico border. The mountains continue into Mexico where they are named the Sierra San Antonio, a mountain range of about 10 miles. Mount Washington (elevation 7,221 ft.) is the highest peak in the Patagonia Mountains. These mountains are part of the Sky Island archipelago, mountain ranges that border Mexico's Sierra Madre Occidental, the major cordillera of western Northern Mexico.

Together, the Patagonia Mountains and Sierra San Antonio form an unbroken habitat corridor for wildlife to move between the Sierra Madre Occidental and mountain ranges of southeastern Arizona.

There are five LZs proposed in the Patagonia Mountains south of Forest Road 61 (BA Figure 1). A sixth LZ is proposed approximately 5 miles north of FR 61 at a saddle between Cumero Canyon and Alum Gulch. The location of and dominant vegetation at each LZ is described below. Aerial photographs of LZs were provided as BA Appendix A.

Italian Canyon Landing Zone

This proposed LZ is on a topographic bench below the mountain crest near the head of Italian Canyon on the west slope of the Patagonia Mountains at elevation 5,500 feet. The plant community is a mix of Semidesert Grassland and Madrean Evergreen Woodland (see vegetation types described in Brown 1994). Tree canopy closure is <40% (see BA Appendix photo A-1) and dominated by Arizona white oak (*Quercus arizonica*), alligator juniper (*Juniperus deppeana*), and Mexican pinyon pine (*Pinus cembroides*). Average tree dbh at the site is 4 inches (HDR 2010).

Italian Canyon is a short tributary (approximately 2 miles) to Sycamore Canyon in the Providencia Canyon Watershed. The watershed drains into the middle Santa Cruz River north of Nogales. Italian Canyon is a narrow, V-shaped valley with granite boulders, bedrock outcrops and intermittent flow (Stefferud and Stefferud 2004). Vegetation in the canyon bottom is primarily dry land species with occasional walnut and grape.

Aliso Well Landing Zone

This site on the west slope of the Patagonia Mountains at an elevation of 6,675 feet is approximately 150 feet lower in elevation than the mountain crest. Slopes drain west to Sycamore Canyon. The vegetation is silverleaf oak, Arizona oak, and manzanita. Average canopy height is approximately 15 feet from ground surface. Canopy closure estimated from the aerial photograph is 40-50% (see BA Appendix photo A-2).

Mount Washington Landing Zone

This LZ is on top of Mount Washington (elevation 6,812 feet). The mountain drops off steeply in all directions and is windswept, as evident from tree growth form. Understory vegetation is dense manzanita. Dominant tree species include Mexican pinyon pine, alligator juniper and oaks. Canopy closure from the aerial photo is apparently <40% (see BA Appendix photo A-3).

Santo Nino Mine Landing Zone

This proposed LZ is on the Patagonia Mountains crest at elevation 6,731 feet. Average canopy height is approximately 18 to 20 feet from ground surface (HDR 2010). Canopy is dominated by juniper and pinyon pine, with some manzanita and Arizona oak. Canopy closure in the aerial photograph is <40% (see BA Appendix photo A-4). Understory consists of manzanita, yucca, agave, and mixed grasses. A well trodden hiking trail evident in the aerial photograph is mostly likely the result of border crossers that use the Patagonia Mountain crest to escape detection by law enforcement.

Fifth (5th) Cattle Guard Landing Zone

This site is on the mountain crest north of Mount Washington. Vegetation is Mexican pinyon pine, Arizona oak, and manzanita. Average canopy height is approximately 18 feet from ground surface (HDR 2010). Canopy closure visible in the aerial photograph appears greater than 40% (see BA Appendix photo A-5) and will require appreciable clearing of vegetation.

Cumero Canyon Landing Zone

This proposed LZ is located approximately 5 miles north of the other five LZs in the Patagonia Mountains. Elevation is approximately 6,106 feet. Tree cover is sparse, with no significant canopy closure (see BA Appendix photo A-6). Dominant vegetation is composed of silver leaf oak, Arizona oak, alligator juniper, and cholla. The LZ occupies a topographic bench between Cumero Canyon and Alum Gulch. Alum Gulch drains north to Sonoita Creek, a distance of approximately 7.6 miles. Cumero Canyon joins the Santa Cruz River approximately 8.5 miles west of the proposed LZ. There are no areas of significant riparian vegetation or surface water in either of these drainages.

Huachuca Mountains

As with the Patagonia Mountains, the north-south trending Huachuca Mountains belong to the Sky Islands region of southeastern Arizona. Elevations range from 3,934 feet at the base to 9,466 feet at the top of Miller Peak. The second highest peak in this range is Carr Peak, elevation 9,200 feet. The mountain crest is narrow and in many places quite steep, rising 4,000 to 5,000 feet in three horizontal miles. The range is about 20 miles in length, intersecting the US-Mexico boundary at its southern extremity. Unlike the Patagonia Mountains, the Huachuca

Mountains do not provide an unbroken mountain corridor into Mexico for wildlife movement. Shortly after entering Mexico, the mountains descend into desert grasslands.

The highest vegetation zone (above 7,000 feet) in the Huachuca Mountains is characterized by white fir (*Abies concolor*), Douglas fir, several pines, and aspen (*Populus tremuloides*). This belt is mainly restricted to the cool north and north east exposures of Miller Peak and Carr Peak from the summits down to about 7,500 feet (Wallmo 1955). Vegetation on the peaks and ridgelines has been heavily influenced by wildfire. Although fire history records show a decrease in fire frequency around the turn of the century, several large stand replacing fires were recorded in the Huachuca Mountains during the mid to late 20th century (Villarreal and Yool 2008).

Five helicopter LZs were constructed on the Huachuca Mountains at Miller Peak and along ridges during the Oversite Fire in 2002. Vegetation above ground level (AGL) at these sites was cleared in a 150-foot diameter area. Three of the existing LZs proposed for maintenance (BA Figure 2) are described below and aerial photographs are provided as Appendix A. CBP currently uses these LZs during emergencies. In 2010, for example, CBP reported 5 incursions. An "incursion" is a single landing and take-off within the Miller Peak Wilderness area. During the same period, the Forest Service landed on Miller Peak once to install a radio repeater.

Miller Peak Landing Zone.

The existing LZ on Miller Peak is a sparsely vegetated (no tree cover), wind-swept area (see BA Appendix photo A-7). The LZ occupies the site of the former Miller Peak Fire Lookout, which had been constructed as early as 1926. The lookout was in existence until the early 1990s, when it was badly vandalized, partially burned, and eventually dismantled. The Miller Peak LZ was constructed in 2002 and has been used since then by the FS for installation of a radio repeater (not every year) and, more often, by CBP during law enforcement actions (e.g., 5 times in 2010).

Tub Springs Landing Zone

This LZ was brushed in 2002 for the Oversite Fire. It has remained sparsely vegetated (see BA Appendix photo A-8).

South Pat Scott Landing Zone

This LZ was brushed in 2002 for the Oversite Fire. There are a few small diameter trees within the 125 feet diameter landing zone that would need to be cleared (see BA Appendix photo A-9).

Mexican Spotted Owl Habitat in the Action Area

The following narrative describes the status of the species in the action area as it relates to the respective LZs.

Patagonia Mountains

There are three spotted owl PACs in the Patagonia Mountains, all north of FR 61. Five of the six LZs proposed in the Patagonia Mountains are located south of FR 61 approximately 5 miles from the nearest PAC. North of FR61, Cumero Canyon LZ abuts (outside) the southeast boundary of the Humboldt Canyon PAC (PAC #03012). This PAC extends from the saddle between Cumero Canyon and Alum Gulch north through a narrow, steep walled canyon commonly referred to as Humboldt Canyon (actually Alum Gulch).

Spotted owl pairs have been reported from Humboldt Canyon PAC most years between 1989 and 1994. Informal surveys in 1997 and 1998 reported no Mexican spotted owls. Nesting was confirmed in 2006 with the location of an active nest at elevation 5,350 feet on a steep southeast facing rock ledge about 30 feet above the canyon floor. The owls nested again in the same area in 2007 and successfully fledged two young (Matt Brown personal communication). Both nest sites and all known day roosts are approximately 1 mile south of the proposed Cumero Canyon LZ.

The south Patagonia Mountains have not been well surveyed for Mexican spotted owl despite containing apparently suitable habitat. This may reflect the difficulties and dangers associated with conducting surveys at night in the exceptionally rugged, brushy, and remote terrain adjoining the international border. The only known surveys south of FR 61 were completed by HDR consultants on May 19 and 20, 2010 (May 26, 2010, memo from K. Stackpole to FWS). No Mexican spotted owls were detected in these surveys. However, the surveys were not conducted according to the 2003 FWS Mexican spotted owl Survey Protocol.

Protocol requires four complete surveys spread out over the breeding season (1 March - 31 August). A complete survey may be a combination of a pre-call (daytime cruise of habitat to be night called) and a night field outing. In remote areas, surveyors may conduct two complete surveys during one trip into the area so long as surveyors allow a minimum of two days between complete surveys. Because the protocol was not followed, results from the 2010 survey should not be used to infer that owls were absent from the project area.

It is reasonable to conclude that Mexican spotted owl occupy the southern Patagonia Mountains based on documented occurrences in other parts of the mountains and in the adjacent Sierra San Antonio. These mountains form a contiguous habitat corridor linking known Mexican spotted owl populations in Mexico and the U.S. It is unlikely, however, that spotted owls roost or nest at any of the proposed LZs.

Canopy cover is sparse (<40%) and/or LZs on ridgelines are too exposed for Mexican spotted owl. Nesting habitat may exist in steep canyon bottoms below certain LZs (i.e., 5th Cattle Guard, Santo Nino Mine, and Mount Washington). Additional surveys are needed to strengthen inferences based on negative survey results. The FWS survey protocol recommends surveys be conducted either the year before or the year of (but prior to) project implementation.

Huachuca Mountains

Fifteen Mexican spotted owl PACs are designated on Forest System lands in the Huachuca Mountains (BA Table 2 and Figure 4). Their boundaries generally conform to ridgelines. It is possible that Mexican spotted owl will use adjacent PACs, particularly if the PAC is unoccupied. Core areas have been identified for 12 PACs in the Huachuca Mountains, and were drawn to encompass the nest site, the roost grove commonly used during the breeding season in the absence of a verified nest site or the best roosting/nesting habitat if both nesting and roosting information are lacking. Birds would be expected to be in or very near these areas in daylight hours during the breeding season. At other times of the year, owls could occur anywhere within a PAC. Seven of the Huachuca Mountain PACs are within the action area.

Monitoring of Mexican spotted owl PAC occupancy on Forest Service land in the Huachuca Mountains began in 1996 (BA Table 2). However, 8 of 15 PACs have had no monitoring since 1997. Four PACs have been monitored regularly over the past 9 to 10 years. These data are unreliable for determining occupancy rate of territories because monitoring was inconsistent. Occupancy rates, expressed as the percent of territories occupied by owls, throughout the Recovery Area are 63.8% for pairs, 15.0% not detected (absent), and 21.2% with a single bird, or presence of a bird or birds.

We do note that there is also a single PAC on the Coronado National Memorial and nine (9) PACs on Fort Huachuca; none are within the action area.

The current status of the habitat within the Huachuca Mountain PACs has not been definitively ascertained since the Monument Fire, which has only relatively recently been contained. It is reasonable to assume that there have been some changes to forest structure within PACs, and reproduction may have been affected by abandonment or direct mortality. Regardless, we anticipate that Mexican spotted owls remain present due to high site-fidelity and lack of areas to which to relocate (Bond *et al.* 2002, 2009; S. Hedwall pers. comm.).

Our current understanding is that the Monument Fire has directly or indirectly affected the Lower Ash Canyon, Lutz Canyon, Hunter Canyon, Miller Canyon, Copper Canyon, Ida Canyon, Bear Canyon, and Oversight PACs. The effects are primarily due to the wildfire itself and range from high intensity burns that consumed all overstory vegetation to lower-intensity burns that left forest structure in place. It is currently believed that most of the core areas associated with the aforementioned PACs survived the fire; the lower Ash Canyon core area was incinerated. We also anticipate that fire suppression activities – overflights, water and slurry drops, and line construction – may have affected Mexican spotted owls to an unknown degree, although the fire suppression effects are far smaller in comparison to the effects of the fire itself. The Upper Carr Canyon and Lower Carr Canyon PACs were potentially affected by both wildfire and suppression activities. The full scope of the Monument Fire's effects will be more definitively determined and will be subject to future, post-fire emergency consultation under file number 22410-2011-FE-0295.

The remaining PACs in the Huachuca Mountains (seven of the fifteen on the Sierra Vista Ranger District, ten on Fort Huachuca, and one on Coronado National Memorial) were not affected, and are presumed to remain occupied or be capable of occupancy by Mexican spotted owls.

Effects of the Proposed Action

General Effects of Disturbance

Mexican spotted owls are most sensitive to human disturbance during the incubation and nestling periods. Helicopter over-flights can affect owl prey delivery rates and the flush rates of owls from their nests. Studies have examined these and other effects of aircraft activity on nesting birds (e.g., Anderson *et al.* 1989; Delaney *et al.* 1999). The former authors noted that nesting red-tailed hawks frequently exposed to helicopter overflights at 35 to 40 meters AGL became habituated to the disturbance and did not leave nests more often than undisturbed birds. The latter observed Mexican spotted owls' reactions to flights conducted at altitudes of 15, 30, and 45 meters AGL and attributed the decreased nesting success in the flight-affected sites to natural attrition, not disturbance. In contrast, ground-based disturbances appear to have a greater effect than aerial disturbances on the nesting success of some bird species.

A bird's behavior during the nesting season is an important determinant of its ultimate nesting success or failure. Various bird species have been reported to abandon their nests after being exposed to ground-based and aerial disturbances. White and Thurow (1985) reported that eight of 24 ferruginous hawk (*Buteo regalis*) nests were abandoned after being exposed to various ground-based disturbances, but Anderson *et al.* (1989) found only two of 29 red-tailed hawk nests were abandoned after being flushed by helicopter flights. Birds may be more susceptible to disturbance-caused nest abandonment early in the nesting season because parents have less time and energy invested in the nesting process (Knight and Temple 1986). Some birds appear reluctant to leave the nest later in the nesting season (Anderson *et al.* 1989; Ellis *et al.* 1991; Delaney *et al.* 1999). Steenhof and Kochert (1982) reported that golden eagles (*Aquila chrysaetos*) and red-tailed hawks exposed to human intrusions during early incubation had significantly lower nesting success than individuals exposed later in the season (45% success for Golden Eagles and 57% for Red-tailed Hawks within experimental groups versus 71% and 74% success with control groups, respectively).

Delany *et al.* (1999) evaluated potential disturbance from helicopter overflights and chainsaw noise on Mexican spotted owls in the Lincoln National Forest. A Sikorsky, HH-60G, Pave Hawk, twinjet helicopter was used. This aircraft is also in use by the Department of Homeland Security. The authors noted that the blade design greatly reduced the whopping sound for this aircraft. Their analysis reflects diurnal flights, as sample size for nocturnal disturbance was too small. Only first exposures at each site were recorded if more than one disturbance occurred during an observation period. The average period between disturbances was almost 13 days with a range of 4 to 79 days. Helicopter flights occurred between August 1 and 22 in the first year and between April 30 and July 25 in the second year.

The authors noted that birds did not flush from roosts when noise levels from helicopters were less than 92 decibels (dB). Additionally, no owls in their study flushed when the noise source was farther than 345 feet away. "Alert" behavior was noted at less than 1,320 feet and no response when helicopters were more than 2,165 feet away. A seasonal change in owl response was noted. The time elapsed between initiation of a disturbance and an alert behavior to be displayed decreased as the nesting season progressed. Conversely, the distance from the flight for an alert behavior decreased during the breeding season. All adult owl flushes occurred after juveniles had left the nest, probably reflecting adult fidelity to the nest during portions of the breeding cycle. The authors recommended a 345 feet (105 m) buffer zone for helicopter overflights to minimize spotted owl flush response and any potential effects on nesting activity.

Landing Zone Site Preparation

Huachuca Mountains

Mexican spotted owls may be affected through removal of plant cover at LZs; however, no Huachuca Mountain LZ will be placed in a designated PAC or in vegetation that could support spotted owl nesting or roosting. Canopy cover is generally too sparse (<40%) and most sites are too exposed to high winds to support owl nesting and roosting. At best, the sites could be used for foraging. The amount of habitat disturbance (< 1 acre among the three Huachuca Mountain sites) is so minor as to be discountable. Noise produced during helicopter approach, landing and idling is more of a concern than habitat impacts because helicopter noise has been shown to alter behavior of Mexican spotted owl (Delaney *et al.* 1999, Johnson and Reynolds 2002).

The three Huachuca Mountain LZs (Pat Scott, Tub Spring, and Miller Canyon) were cleared of trees, snags, and brush in 2002 for the Oversite Fire. Owls are not expected to use these sites because they now lack suitable structure and are exposed to high winds. We also note that habitat structure in the areas surrounding the Tub Spring and Miller Canyon LZs was appreciably altered by the Monument Fire in June 2011. The most suitable Mexican spotted owl roosting and nesting habitat near these sites occurs (even post-fire) in the core areas. These areas are far removed from the LZs (i.e., at least 0.3 mile and 600 feet lower in elevation). Mexican spotted owls may forage along or near the helipads on calm nights, but the LZs themselves are unlikely to provide a significant source of prey because they do not contain the PCEs for prey habitat (i.e., high volumes of fallen trees and a wide range of tree species). Site preparation will occur during daylight hours when owls are not foraging or ranging widely from roosts. We thus anticipate that the restoration of the three Huachuca Mountain LZs to usable condition will have insignificant and discountable effects to PACs.

The Huachuca Mountain LZ sites' preexisting absence of PCEs means that site preparation and subsequent use will not affect the critical habitat's ability to contribute to the recovery of Mexican spotted owls. The greater-than-0.25 mile distance from breeding areas will avoid noise disturbance associated with chain saw use at the Tub Spring and South Pat Scott LZs. Only hand tools will be used at the Miller Peak LZ due to Wilderness restrictions.

Patagonia Mountains

The Italian Canyon and Cumero LZs and the immediately adjacent areas in the Patagonia Mountains appear to lack the site characteristics necessary for them to serve as breeding or foraging habitat for Mexican spotted owls. The Aliso Well, Mount Washington, Santo Nino, and 5th Cattle Guard LZs, however, contain sufficient canopy closure of larger woody species to potentially provide foraging habitat for owls breeding in nearby areas. Effects to the four Patagonia Mountain LZs are similar to those described above for the three sites in the Huachuca Mountains, though more extensive vegetation clearing must be conducted at the former sites prior to their use as helipads.

The clearing of the Aliso Well, Mount Washington, Santo Nino, and 5th Cattle Guard LZs will occur during daylight hours when owls are not foraging or ranging widely from roosts. The 1.8 acres of land to be cleared (0.3 acre at six LZs) represents a minute effect relative to the acreage of a 600-acre PAC (or more likely, multiple PACs) and, while no PACs have been designated in the Patagonia Mountains, the acreage nevertheless represents a useful point of reference. The LZs are also likely to be separated from the most probable roost sites (analogous to core areas defined previously) by distances of at least 0.25 mile, which will avoid noise disturbance associated with chain saws. The small acreage of disturbance, as well as the positioning of the proposed Patagonia Mountain LZs on ridgelines away from the most likely roost sites, renders the proposed action unlikely to affect individual Mexican spotted owls to the extent that they are incidentally taken.

Furthermore, given the brevity and small magnitude of the impacts to individuals of the species, we do not anticipate that the recovery of the Mexican spotted owl will be affected. Similarly, these brief and small scale effects (1.8 acres) are unlikely to measurably affect the critical habitat's ability to contribute to the recovery of the species at the scale of the Basin and Range-West EMU 15 (Huachuca Mountain area; 50,844 acres), the overall Basin and Range-West EMU (1,181,873 acres), or rangewide (8,600,000 acres).

Helicopter Operations

The prior section discussed the effects to physical habitat and disturbance of Mexican spotted owls resulting from clearing and construction of LZs on ridgelines adjacent to PACs. While we do not anticipate that such activities will measurably affect reproductive success, we do anticipate that the proposed use of the LZs for helicopter operations will disturb owls within up to seven PACs where they exist adjacent to the sites and in analogous habitat where PACs have not been designated.

Tub Spring LZ and South Pat Scott LZ are at the perimeter of four designated PACs on the Huachuca Mountains crest (three PACs at Tub Springs, one at South Pat Scott). The Miller Peak LZ is at the corner of four PACs. These PACs will be subject to the disturbance associated with low-level flights along routes of ingress and egress. With the exception of Upper Bear Creek

PAC (#03-011) near the Tub Springs LZ, all core areas are at least 2,000 feet (610 m) in horizontal distance from the nearest LZ (see BA Figure 4) and are at least 600 feet (183 meters) different in elevation than the nearest LZ. We estimate that the Upper Bear Creek PAC's vertical separation from the Tub Spring LZ is approximately 500 feet (152 meters), while its lateral separation is comparable to the other LZs.

The lateral distance and topography between LZs and areas that Mexican spotted owls are most likely to occupy during breeding season should minimize effects to nesting or roosting activities. These core areas are in canyon bottoms, typically containing tall trees and steep cliffs. Helicopters should avoid flying low over these areas. Moreover, helicopters shall maintain a minimum 345 feet (105 m) flight elevation except during landing and taking off. The altitudinal restrictions, distance and steep topography between LZs and core areas within which owls are presumed to roost and reproduce are anticipated to combine to attenuate helicopter noise associated with overflights and operations to a level that would have insignificant effects to Mexican spotted owl breeding activities.

The daily and seasonal timing of flights, the frequency of flights, and the specific ingress and egress routes cannot be determined in advance. These routes are based first and foremost on safety and are dependent upon weather, activity, threat, and type of aircraft. We thus anticipate that sub-345 foot (105 meter) approaches and takeoffs will occur over portions of the seven PACs associated with the Tub Spring LZ, South Pat Scott LZ, and Miller Peak LZ in the Huachuca Mountains, including at night when Mexican spotted owls are most actively foraging, and occasionally during the breeding season. No PACs or core areas have been designated in the Patagonia Mountains, but it is likely that sub-345 foot (105 meter) flights will occur over analogous areas within which Mexican spotted owls are foraging, again, occasionally at night and/or during the breeding season. The flush response behavior noted by Delany *et al.* (1999), above, is thus reasonably certain to occur at any or all of the LZsat some point during the open-ended period of implementation of the proposed action. This response constitutes an adverse effect to the species, and thus cannot be considered insignificant and discountable. This behavioral response does not rise to the level of incidental take, as we anticipate that it will not result in injury to the species to such an extent as to significantly (meaning measurably) disrupt normal behavior patterns such as breeding, feeding, or sheltering, and thus, it will not measurably impair the ability for the species to recover.

An interdependent action of the use of LZs for helicopter based operations is the increased entry of Border Patrol agents into adjacent areas. Each LZ has been proposed to be used at least eight (8) times per year. Each use would consist of a single landing and take-off. It is assumed that several agents will be associated with each incident, either debarking from the LZ and/or being retrieved from the surrounding areas. Ground disturbances appear to have a greater effect than aerial disturbances on the nesting success of some bird species. While such disturbances are unlikely to occur every year in all potentially-affected PACs, solely during the breeding season, we anticipate that some level of disturbance – at least the flush response noted by Delaney *et al.* (1999) - will occur during implementation of the proposed action. Diversion of foraging activities may occur, but we do not currently anticipate that breeding would be affected by the

agents' entries. The BA states that personnel are unlikely to enter the steep, densely-vegetated canyons in which owls roost and breed, and this appears even less likely at night. Regardless, disturbance of nesting birds near LZs remains a finite possibility, particularly in the Patagonia Mountains, which feature somewhat less tortuous terrain than do the Huachuca Mountains. In summary, these adverse effects, while reasonably certain to occur, are anticipated to be so infrequent at each PAC as to result in no measurable effect to recovery of the Mexican spotted owl.

Trend data are generally lacking, but the actual number of Mexican spotted owls and temporal trend of those numbers are important. Since the owl was listed in 1993, the documented range of the U.S. owl population has increased in size as new areas have been surveyed for owls. Within the documented species' range there is little evidence of populations disappearing, though individual territories may have been vacated (but see Stacey and Peery 2002). The species is numerous [estimated to number 2,074 in Arizona and New Mexico alone (Fletcher (1990) to 2,160 owls throughout the United States (FWS 1991)] and widespread within the action area, the Basin and Range West EMU, and rangewide. The total documented population size has increased with the additional surveys throughout the range (i.e., populations on National Park Service lands, and others). However, the population trend remains unclear. Revised population estimates recorded 758 owl sites from 1990 to 1993, and 1,222 owl sites from 1990 to 2004. For the draft 2011 Mexican Spotted Owl Recovery Plan Revision, the Recovery Team compiled 1,301 owl sites known today in the U.S. portion of the species' range.

We do acknowledge that these numbers are outdated and have likely been affected by extensive wildfire activity in 2011, which may have reduced the species' abundance and distribution within various EMUs. Within the Basin and Range-West EMU, the Horseshoe 2, Monument, and Murphy Complex wildfire perimeters encompassed approximately 321,500 acres of land, with an undetermined proportion of that acreage being habitat (including critical habitat) for Mexican spotted owls. The Wallow Fire is within the Upper Gila Mountains UMU. Its perimeter encircled approximately 538,000 acres; although some of this area was not entirely burned, it is assumed that an appreciable number of PACs or owl sites were consumed and that adult owls and offspring were killed. The Jack Complex (5,000 acres, on the divide between the Basin and Range-West and Upper Gila Mountain EMUs) and the Las Conchas and Pacheco fires (157,000 and 10,000 acres, respectively, in the Southern Rocky Mountain EMU) may have had similar effects to owls but, again, the exact magnitude cannot be determined at this time.

Regardless, the disturbance to owls and offspring occupying up to 10 PACs (see discussion regarding the specific PACs associated with LZs, above) represents an immeasurably small effect to the number of PACs available in the local area (3 known PACs in the Patagonia Mountains, up to 25 PACs in the Huachuca Mountains), and rangewide on Federal lands in the four corners States (which we estimate at well over 1,000 PACs, even considering recent wildfires). In terms of revised methods of determining abundance, we anticipate similarly small effects to the up to approximately 1,301 currently known owl sites in the U.S. portion of the species' range.

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.

Because of the extent of Federal lands managed by the Coronado National Forest at or in the vicinity of Mexican spotted owl PACs and critical habitat potentially affected by the proposed action, most activities that may affect the Mexican spotted owl and its critical habitat are Federal activities and subject to additional section 7 consultation. Exceptions include private actions on small inholdings within Forest lands. Activities that may result in cumulative effects include livestock grazing activities, small-scale development, and road construction on these private lands. In some cases, these activities may directly or indirectly affect Mexican spotted owls or their habitats. Many illegal activities associated with cross-border smuggling and illegal immigration also occur in the action area. These activities result in creation of trails and routes that can degrade Mexican spotted owl habitats and disturb individual birds. Persons involved in these illegal activities often build cooking or warming fires, some of which escape and become wildfires.

Conclusion

After reviewing the current status of the Mexican spotted owl, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the Mexican spotted owl, nor likely to destroy or adversely modify designated critical habitat for the species. We present these conclusions for the following reasons:

- Site preparation activities at the LZs will occur during daylight hours and will use only hand tools and small motorized implements (i.e., chainsaws).
- The PCEs of Mexican spotted owl critical habitat do not exist at the Tub Spring, South Pat Scott, and Miller Peak LZs in the Huachuca Mountains nor in the Italian Canyon and Cumero LZs in the Patagonia Mountains and thus, they will not be removed.
- Approximately 1.2 acres of habitat with owl-appropriate PCEs will be affected during preparation of the Aliso Well, Mount Washington, Santo Nino, and 5th Cattle Guard LZs in the Patagonia Mountains. This represents a measurable impact to critical habitat, but is unlikely to be biologically relevant to Mexican spotted owls due to the lateral and elevational separation between the LZs and known or likely core areas. Construction of all nine LZs will not adversely modify or destroy critical habitat, nor will the critical habitat's ability to contribute to the recovery of the Mexican spotted owl be reduced. This is primarily because of the small scale of the effects relative to the remaining critical habitat that remains unaffected.
- The LZs are separated from known and probable roost and nest sites by considerable horizontal and vertical distances [no less than 1,320 feet (0.25 mile)] as well as topographic

features (such as steep-sided canyons). The exception is the Upper Bear Canyon PAC, which has the approximately 0.25-mile lateral separation, but only 500 feet of vertical separation from the Tub Springs Miller Peak LZ. The construction and operation of the LZs are thus unlikely to measurably affect Mexican spotted owl breeding activities or nest success.

- The sub-345-foot flight elevations that may occur during ingress and egress, at night, and during the breeding season, are likely to elicit a flush response to foraging Mexican spotted owls present in peripheral areas of PACs (in the Huachuca Mountains) or the presumed-to-be-analogous areas in the Patagonia Mountains. We do not anticipate such effects will result in reduced nest success, but the effects cannot be discounted nor considered insignificant.
- The occasional entry of helicopter-borne personnel into Mexican spotted owl habitat is anticipated to occasionally disturb birds, including the flushing of breeding individuals from a roost site. We cannot, however, be reasonably certain that measurable changes in reproductive success will result from this presumed-to-be infrequent activity.
- As detailed in the Effects of the Proposed Action section, above, the impacts of construction and operation of the LZs will not affect recovery of Mexican spotted owls, either through effects to individual animals, owl sites, PACs, or critical habitat. This is due to both the small scale of the effects relative to the number of owls and the acreage of critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "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.

Amount or Extent of Take

We expect that the proposed conservation measures will ensure that the action does not incidentally take any Mexican spotted owls through harm, harassment, or mortality, nor do we anticipate that habitat modifications will reach the scale where harm occurs. We therefore do not anticipate that implementation of the proposed action will result in the incidental take of any Mexican spotted owls.

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. The Coronado National Forest should survey for and monitor the status of Mexican spotted owls in the Huachuca and Patagonia mountains, with increased focus on determining whether core areas and PACs can be designated in the latter.
2. The Coronado National Forest, CBP, and FWS should meet to discuss research needs and funding opportunities related to the effects of helicopter and ground-based law enforcement operations on Mexican spotted owls and their habitat in locations where LZs are in close proximity to foraging areas. Research topics could include quantification of flight timing and frequencies; effects on owl behavior, energetics, movements, and reproduction; and effects to the habitat resulting from new foot traffic associated with the LZs.
3. The Coronado National Forest and Border Patrol should implement applicable sections of the 1995 and draft first revision to Mexican Spotted Owl Recovery Plan.

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitat, we request notification of the implementation of any conservation recommendations.

Reporting Requirements/Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the FWS's Division of Law Enforcement, 2450 West Broadway, Mesa, Arizona (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, and any other pertinent information. Care must be taken in handling injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to the nearest FWS or Arizona Game and Fish Department office, educational, or research institutions (e.g., University of Arizona in Tucson) holding appropriate state and Federal permits.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, the FWS should be contacted regarding the final disposition of the animal.

Reinitiation and Closing Statement

This concludes formal consultation on the proposed maintenance and/or construction of nine helicopter landing zones in the Huachuca and Patagonia Mountains in Santa Cruz and Cochise counties, Arizona. 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 maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may adversely affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by this action.

We appreciate the Coronado National Forest's efforts to identify and minimize effects to listed species from this project. For further information please contact Jason Douglas (520) 670-6150, (x226) or Jean Calhoun (520) 670-6150, (x223). Please refer to the consultation number, 22410-2010-F-0410 in future correspondence concerning this project.

for Steven L. Spangle

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Appendix A: Concurrences

Jaguar

Status of the Species

Jaguar was listed as Endangered in the United States in 1997 (62 FR 39147). The FWS initially found the designation of critical habitat to be not prudent because designation was found to increase the chance of direct taking. Critical habitat designation was again analyzed in 2006, and FWS again found it not be prudent because there would be no conservation benefit to the species (71 FR 39335). In 2010, the FWS reconsidered critical habitat for the jaguar and found it prudent to consider determination; a final determination is anticipated in spring of 2012.

The primary threat to jaguars in the United States is from shooting and possibly the reduction in understory vegetation density in riparian areas (59 FR 35675). Jaguars in Arizona declined concurrently with predator control that was associated with land settlement and development of the cattle industry (Brown 1983). Hunting still remains a threat to jaguars. At least 64 jaguars have been killed in Arizona since 1900 (Brown 1991), one as recently as 1986 (Girmendonk 1994). Other actions that may affect jaguars include clearing of habitat, destruction of riparian areas, fragmentation or blocking of corridors that jaguars may use between Mexico and the United States, and any trapping or animal control activities that target jaguars or other large predators (59 FR 35675).

Habitat studies in the core jaguar range indicate a close association with water, dense cover (Schaller and Crawshaw 1980; Quigley and Crawshaw 1992), and sufficient prey (Seymour 1989; Swank and Teer 1989) and an avoidance of highly disturbed areas (Quigley and Crawshaw 1992). Range-wide, jaguars occupy a variety of habitats but generally occur in well vegetated areas (Seymour 1989). Ortega-Huerta and Medley (1999) found jaguars were more common on moderate to steep slopes in the Sierra de Tamaulipas, Mexico. Several studies have shown that jaguars selectively use large areas of relatively intact habitat away from roads and human settlements (see references in Johnson and Stuart 2007).

In the American Southwest, Brown and López-González (2000) noted kill-location elevations for 62 jaguars killed since 1900 ranged from 1,649 feet to more than 9,843 feet; most were above 4,921 ft in mountains. Most Arizona records have been from shrub-invaded semidesert grassland and Madrean evergreen-woodland, in intermediately to extremely rugged terrain, and within 6.2 miles of a water source (Brown 1991, Hatten *et al.* 2002).

Numerous sightings of jaguars have been recorded in northern Mexico and southwestern United States since the 1997 listing (Brown and López-González 2001, McCain and Childs 2008), either because of increased efforts in detecting individuals or increased movements of individuals across the border, or both. Recently (1996 through 2007), four male jaguars have been documented in the United States. In March 1996, an adult male (more than 3-5 years old) was photographed in the Peloncillo Mountains of southwestern New Mexico near the Arizona border

(Glenn 1996). In August 1996, a younger male (2 to 3 years of age) was photographed in the Baboquivari Mountains southwest of Tucson (Childs 1998). A possible third unidentified jaguar was photographed in the same area (McCain and Childs 2008). In February 2006, another male jaguar (different from the Peloncillo jaguar and Baboquivari jaguar) was photographed in the Animas Mountains of southwestern New Mexico (McCain and Childs 2008). Prior to these sightings, the last confirmed report of a jaguar in Arizona was in 1986 when one was killed in the Dos Cabeza Mountains (Girmendonk 1994).

On February 18, 2009, the AGFD captured and radio-collared an adult male jaguar (named "Macho B") southwest of Tucson at approximately 4000 ft elevation, in a transition between desert grassland and oak woodland (Johnson and Stuart 2007). Previous camera-trap photographs had confirmed Macho B's presence in the Arizona borderlands from August 31, 1996, through January 21, 2009. Sadly, the animal succumbed to renal failure 12 days after its release into the wild and had to be euthanized.

McCain and Childs (2008) maintained trail cameras and conducted track surveys for jaguars in southeastern Arizona from March 2001 to July 2007. Surveys focused on major travel routes and natural funnels through core and connective habitats in mountain ranges from the Baboquivari Mountains east to the San Rafael Valley and approximately 50 miles north of the international border (BA Figure 2). Cameras were placed along washes, trails, dirt roads, ridges and canyon bottoms, and in areas where wildlife travel was naturally directed by landscape features. They documented 2 adult males and a possible 3rd unidentified jaguar. Movements appeared focused in key connective habitats in several mountain ranges and canyon bottoms that span the international border (McCain and Childs 2008; BA Figure 3). On 5 occasions, jaguars were photographed and tracked as they moved back and forth across the United States–Mexico border.

Historically, jaguars may have been a resident species in Arizona (Brown 1983; Hoffmeister 1986) as indicated by more frequent sightings, including several females and one with cubs (Brown and Lopez Gonzales 2000). Recent U.S. jaguar sightings (post 1963) have been of males, suggesting possible dispersal of individuals originating in northern Mexico (Rabinowitz 1999): males are more prone than females to wander (Brown and Lopez Gonzales 2001) and have been known to roam hundreds of kilometers in search of new territory (Seymour 1989). Based on finding jaguars in their study area "frequently, continuously, and year-round", McCain and Childs (2008) assert adult jaguars might be resident (albeit in very low numbers) in the Arizona-New Mexico borderlands shared with Mexico.

Jaguars in the United States are part of a population, or populations, that occur largely in Mexico. In northwestern Mexico, jaguars occur from the rugged barrancas connecting northeastern Sinaloa, southeastern Sonora, and southwestern Chihuahua, north to the border with the U.S. The most northern recently documented breeding population of jaguars is now known to be centered in (but not restricted to) east-central Sonora, around Huasabas, Sahuaripa, and Nácori Chico, about 130 miles south of the U.S.-Mexico border (Brown and López-González 2001). The Arizona and New Mexico jaguars reported from 1996 through 2009 (Childs 1998,

Glenn 1996, Childs and Childs 2008, McCain and Childs 2008) almost certainly belong to the northernmost (Huasabas-Sahuaripa) population known in Mexico (Rosas-Rosas 2006).
It is generally accepted that an established jaguar population was extirpated from the United States by the 1960s (Swank and Teer 1989) and the recent sightings of male jaguars in the southwestern U.S. are dispersing animals from populations in Sonora, Mexico. Jaguar habitat in Mexico is becoming smaller and more fragmented due to expanding human populations (Swank and Teer 1989, Rabinowitz 1999). While Rabinowitz (1999) considered the southwestern United States marginal habitat for jaguars in terms of cover, water, and prey availability, any habitat in the U.S. may potentially be significant for Sonoran jaguar populations. Furthermore, with no known breeding north of the border since 1910, jaguars in the U.S. are dependent on reproduction in Mexico, emphasizing the importance of protecting and creating travel corridors between the U.S. and Mexico (Johnson and Stuart 2007; BA Figure 3). The Jaguar Scientific Advisory Group (Johnson and Stuart 2007) has stressed the importance of identifying and maintaining a travel corridor between the jaguar population in Sonora, Mexico and Arizona.

Environmental Baseline

The best-suited area for jaguar conservation in Arizona is located in southeastern Arizona in Santa Cruz, Pima, Cochise and Graham Counties (Hatten *et al.* 2002). The range of elevations and vegetation types, proximity of water, and terrain ruggedness combine to make the Patagonia Mountains a likely area for jaguars to occur in the U.S., either as transients or residents. The Patagonia Mountains provide connective habitat for jaguars dispersing from known populations in Sonora, Mexico, into the U.S. (McCain and Childs 2008; BA Figure 3). Indeed, the relatively large number of jaguar sightings (at least 5 since 1907) from the Patagonia Mountains, including a hunter kill near Mt. Washington in 1965 (Brown and López González 2001) is a strong indication of habitat suitability and potential for jaguars to occur in the project area.
There are no records of jaguars from the Huachuca Mountains. One possible explanation for the absence of jaguar sightings in the range is its isolation from mountain ranges in Mexico. Unlike the Patagonia Mountains, the Huachuca Mountains essentially end at the US-Mexico border. McCain and Childs (2008) established automatic trail cameras in the Patagonia Mountains in canyon bottoms but failed to document jaguars in the mountain range. The estimated minimum home range (525 miles^2) of an adult male jaguar they photographed repeatedly in the mountain ranges to the west of the Patagonia Mountains does not extend as far east as the Patagonia Mountains (BA Figure 3).

The CBP has constructed miles of new fence along the border designed to prevent vehicles and human pedestrians from crossing illegally into the U.S. Fences designed to prevent the passage of humans will also prevent passage of jaguars, as jaguars are unlikely to jump over the 15 to 18-foot fence. The effect of permeable barriers, such as vehicle barriers, on jaguar movements is not known, although information suggests that they may also affect jaguars. McCain and Childs (2008) documented movement of jaguars back and forth across the international border while the fences were being constructed. The jaguar known as "Macho B" was no longer documented near the border after temporary vehicle barriers were installed. It is not known if this avoidance was due to increased human presence, the vehicle barriers, or some other reason. There are no gaps

in the fence except at large washes where the border fence is seasonally removed. Jaguars can move around the ends of the fence, although the extent to which they will do so is unknown. West of Nogales, the border fence ends at the CNF boundary on the lower slopes of the Patagonia Mountains. The fence may channel jaguars into the Patagonia Mountains through remote, currently unfenced areas.

Until recently, the Patagonia Mountains south of Forest Road (FR) 61 were relatively undisturbed by humans, providing secure habitat for transient and resident jaguars. Conditions have changed, however, with recent construction of pedestrian fences and vehicle barriers along the U.S.-Mexico border west and east of the Patagonia Mountains (Figure 3). Border infrastructure, coupled with increased CBP surveillance, is causing a shift in smuggling and law enforcement activity into higher elevations, where disturbance by humans and habitat degradation will have greater negative effects on jaguars than before.

Conclusion

The direct effects of the proposed action would result from construction and maintenance of the LZs. These effects include removal of trees and other vegetation that could provide cover for jaguars and their prey. Jaguars are more likely to use habitat in the Patagonia Mountains than in the Huachuca Mountains due to the former mountain range's remoteness and connectivity to occupied jaguar habitat in Mexico. Vegetation removal at the Patagonia Mountains LZs would impact approximately 1.8 acres of apparently suitable jaguar habitat (0.3 acre per site).

Vegetation cutting and helicopter flights would result in noise. Wildlife response to noise varies with species and is largely determined by the noise level (decibel), frequency, timing and duration. Some species can habituate to traffic noise, particularly if the noise is predictable. Wildlife may avoid areas during the noise generating activity and return to normal behavior within a relatively short period of time. Jaguars are secretive animals and tend to avoid highly disturbed areas (Quigley and Crawshaw 1992). Habitat avoidance due to noise would be infrequent (8 times per year) and short-term (less than 3 hours).

The proposed action may affect, but is not likely to adversely affect jaguar because the potential for jaguar to occur in the project area is unlikely and any effects to the species would be insignificant. The potential for a jaguar to be in the Huachuca Mountains is discountable. While no jaguars have been sighted in the Patagonia Mountains in the last 42 years despite recent intensive surveys, the habitat is suitable (based on AGFD habitat suitability mapping) and there is a slight possibility that a jaguar could occur in the Patagonia Mountains, albeit during transitory use. The amount of habitat disturbance ($\leq$3 acres) would be small relative to the amount of available habitat for jaguars in SE Arizona. Habitat avoidance due to noise during construction and maintenance would be short-term.

Ocelot

Status of the Species

The ocelot is listed as endangered throughout its range in the western hemisphere, where it is distributed from southern Texas and southern Arizona through Central and South America into northern Argentina and Uruguay (47 FR 31670). Critical habitat is not designated for this species. Recovery for the ocelot was originally addressed in *The Listed Cats of Texas and Arizona Recovery Plan (with Emphasis on the Ocelot)* (FWS 1990). An updated recovery plan was released for comment in 2010 (FWS 2010) and revisions are currently underway.

The Texas population has fewer than 50 ocelots, found in 2 separated populations in southern Texas, at the northern limit of the species' distribution. In November 2009, an ocelot (*L. p. sonoriensis*) was documented in Arizona (in Cochise County) with the use of camera traps (Sky Island Alliance 2010, unpubl. data). Additionally, in April 2010, an ocelot was found dead on a road near Globe, Arizona, and a genetic analysis is underway to determine the origin of this specimen, although preliminary data indicate the young male ocelot was not of captive origin (Arizona Game and Fish Department 2010, unpubl. data). AGFD took pictures and collected hair and scat samples to determine if the individual was of wild origin. The hair samples came back inconclusive to determine if the cat was of wild origin. More recently, a male ocelot was documented in Miller Canyon of the Huachuca Mountains on February 8, 2011. This may be the same individual photographed by a remote camera in the Huachuca Mountains on May 26, 2011.

Prior to these findings, the last known ocelot in Arizona was lawfully shot on Pat Scott Peak in the Huachuca Mountains in 1964 (Hoffmeister 1986, Lopez Gonzalez *et al.* 2003). In addition to the recent Arizona sightings, a number of ocelots have been recently verified within 30 miles of the U.S./Mexico international border at Rancho El Aribabi through the use of infra-red cameras. Habitats used by the ocelot throughout its range vary from tropical rainforest, pine forest, gallery forest, riparian forest, semi deciduous forest, and dry tropical forest, to savanna, shrublands, and marshlands. Despite the apparent broad habitat affinity, the species does not appear to be a habitat generalist. Ocelot spatial patterns are strongly linked to dense cover or vegetation, suggesting it uses a fairly narrow range of microhabitats (Emmons 1988, *FWS* 2010). Ocelots in South Texas apparently prefer shrub communities with >95% canopy cover and avoid areas with intermediate (50-75%) to no canopy cover. Other microhabitat features important to ocelots appear to be canopy height (>7.8 ft) and vertical cover (89% visual obscurity at 3.2-6.5 ft). Ground cover at locations used by ocelots was characterized by a high percentage of coarse woody debris (50%) and very little herbaceous ground cover (3%), both consequences of the dense woody canopy.

Little is known about ocelot habitat use in Arizona and Sonora; however, Lopez Gonzalez *et al.* (2003) found that 27 of the 36 records (75%) of ocelots in Sonora were associated with tropical or subtropical habitat, namely subtropical thornscrub, tropical deciduous forest, and tropical thornscrub. Only males (11.1% of the total records) were recorded in temperate oak and pine-oak woodland. We hypothesize that dense chaparral or manzanita stands could be structurally

similar to the subtropical habitat types and thus, support ocelot.

Environmental Baseline

While it is possible that ocelot currently exist in Arizona, there is no evidence that a population has been established. All observations to date have been of single males. It is likely that these individuals had strayed north from breeding populations in Mexico. The San Pedro River east of the Huachuca Mountains supports contiguous riparian/gallery forest that ocelot may use as a travel corridor between Mexico and the U.S. Despite the possibility of ocelot in the area, vegetation at the LZs does not appear suitable to attract or hold the species.

Conclusion

Construction and maintenance of LZs would reduce vegetation cover that may affect ocelots. However, the cover is not apparently suitable for ocelots (<50% canopy and discontinuous). Noise produced by low-flying helicopters may cause ocelots to abandon or avoid the LZs. Noise disturbance would be of short duration, lasting no more than a few hours.

The proposed action may affect, but is not likely to adversely affect ocelot because the potential for ocelot to occur in the project area during a take-off or landing event is discountable and any effects to the species would be insignificant. While there is a slight possibility that a single male ocelot could occur in the project area, its occurrence would be transitory. The amount of habitat disturbance (less than 3 acres) would be small relative to the amount of available habitat for ocelots in SE Arizona and in Mexico. Habitat avoidance due to noise would be infrequent (maximum 8 times per year) and short-term (<3 hours).

Lesser Long-Nosed Bat

The lesser long-nosed bat was listed as Endangered without critical habitat on September 30, 1988 (53 FR 38456). A recovery plan was completed in 1995. The species is migratory and is found in Arizona and New Mexico primarily between April and October (Cockrum and Petryszn 1991, Sidner 1999). Pregnant females arrive in late April and early May and feed on nectar and pollen of saguaros and other columnar cacti. In late-July and early-August, adult males arrive to join females and young as they disperse from maternity roosts to feed on the nectar and pollen of paniculate agaves (*Agave palmeri*, *A. parryi*, and *A. deserti*). At this time, the species' range expands east and north into plant communities generally occurring at higher elevations than the earlier foraging grounds. Day roosts are in caves and mines, while night roosts also include rock crevices, trees and shrubs, and occasionally, abandoned buildings (FWS 1997). Lesser long-nosed bats are known to fly long distances (15-38 miles one-way) from roost sites to foraging sites (Horner *et al.* 1990, Dalton *et al.* 1994). By mid- to late-September, the majority of bats have left Arizona and New Mexico and returned to Mexico; however, they have been recorded as late as November in the Huachuca Mountains. Lesser long-nosed bats are known to be very sensitive to disturbance at their day roosts.

Abandoned mines and caves in the Patagonia Mountains may provide roost sites for lesser long-nosed bat and other species of bats. There are no known mines or caves in the project area. In 2006 and 2007, 18 abandoned mines in Flux Canyon and Alum Gulch were surveyed for bats (U.S. Forest Service 2006). No evidence of use by lesser long-nosed bats was found in the surveys. Abandoned mines on the east side of Washington Peak have not been surveyed for bats. The Patagonia Bat Cave is a large post-maternity roost located >5 miles northeast of the project area. The roost generally has lesser long-nosed bats between July and September. Exit surveys conducted in 2004 estimated over 20,000 bats in late August. At the south end of the Huachuca Mountains, on Coronado National Memorial, the abandoned State of Texas Mine is a large post-maternity roost.

Effects of the Proposed Action

The proposed action would have no affect to bat roosts because none are known within the project area. Forage resources and foraging behavior of lesser long-nosed bats may be disturbed. Nectar from agave is an important food resource for lesser long-nosed bats. Agave plants within LZs could be destroyed, although the number of plants is likely to be low (i.e., <1% of total agave available to bats in the project vicinity).

Given the proximity of known lesser long-nosed bat post-maternity roosts to the project area, bats are likely to forage on flowering agave within and near the project area. Bats may be negatively affected by helicopter noise and lights if flights occur at night from July through August. These impacts could be avoided or minimized by limiting the number and duration of nighttime flights. The maximum amount of foraging habitat that would be disturbed would be small (less than 3 acres).

Conclusion

Helicopter landing zone construction, use and maintenance may affect but is not likely to adversely affect the lesser long-nosed bat. There are two known post-maternity roosts greater than 5 miles from the action area that would not be affected. No abandoned mines (potential bat roosts) would be impacted. The number of agave plants that may be affected (less than 1 percent of total available agave in the immediate area) is not expected to affect bat foraging opportunities or disrupt normal foraging behavior. Helicopter flights at night may cause lesser long-nosed bats to vacate and/or avoid the LZs but this avoidance would be brief and infrequent. The anticipated level of disturbance to bat foraging activity would be insignificant when compared to the total amount of foraging habitat available to lesser long-nosed bats in the general area.

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