DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018–AD02

Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Mexican Spotted Owl

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: The U.S. Fish and Wildlife Service (Service) designates critical habitat for the Mexican spotted owl (*Strix occidentalis lucida*), a subspecies federally listed as threatened under the Endangered Species Act of 1973, as amended (Act). The Mexican spotted owl, also referred to herein as spotted owl or owl, inhabits canyon and montane forest habitats across a range that extends from southern Utah and Colorado, through Arizona, New Mexico, and west Texas, to the mountains of central Mexico. The designation includes 107 units totaling 1,874,935 ha (4,632,901 acres) in Arizona, Colorado, New Mexico, and Utah.

This critical habitat designation provides additional protection requirements under section 7 of the Act with regard to activities that are funded, authorized, or carried out by any Federal agency. As required by section 4 of the Act, the Service considered economic and other impacts of designation prior to making a final decision on the size and scope of critical habitat. Critical habitat is located primarily on Federal and Tribal land and, to a lesser extent, on state and private lands.

EFFECTIVE DATE: This rule becomes effective July 6, 1995.

ADDRESSES: The complete administrative record for this rule is on file at the U.S. Fish and Wildlife Service, New Mexico Ecological Services State Office, 2105 Osuna N.E., Albuquerque, New Mexico 87113; telephone: (505) 761–4525. The complete file for this rule will be available for public inspection, by appointment, during normal business hours at the above address.

FOR FURTHER INFORMATION CONTACT: Jennifer Fowler-Propst, State Supervisor, at the above address.

SUPPLEMENTARY INFORMATION:

Background

The Mexican spotted owl is a medium-sized bird ranging from parts of central Colorado and Utah, south through Arizona, New Mexico, and western Texas, then south through Mexico to the States of Michoacan and Puebla. Mexican spotted owl habitat typically consists of dense, multi-storied, montane forests with closed canopies, and deep, cool, fractured canyons. Analysis by the Mexican Spotted Owl Recovery Team has determined that the owl is threatened primarily by modification of habitat caused by commercial timber harvest methods and wildfires.

Previous Federal Actions

The entire spotted owl species (*Strix occidentalis*) was classified on the Service's 1989 Animal Notice of Review (54 FR 554, January 6, 1989) as a category 2 species. A category 2 species is one for which listing may be appropriate, but for which additional biological information is needed to support a proposed rule. The northern spotted owl subspecies (*S. o. caurina*) was listed as a threatened species on June 26, 1990 (55 FR 26194), and critical habitat was designated for it on January 15, 1992 (57 FR 1796). The California spotted owl subspecies (*S. o. occidentalis*) remains a category 2 candidate.

On December 22, 1989, the Service received a petition submitted by Dr. Robin D. Silver requesting the listing of the Mexican spotted owl as an endangered or threatened species under the Act. On February 27, 1990, the Service found that the petition presented substantial information indicating that listing may be warranted and initiated a status review. In conducting its review, the Service published a notice in the **Federal Register** (55 FR 11413) on March 28, 1990, requesting public comments and biological data on the status of the Mexican spotted owl. On December 6, 1990, the Mexican Spotted Owl Status Review Team completed a draft report, and on February 20, 1991, the Service made a finding, based on the contents of the report, that listing the Mexican spotted owl pursuant to section 4(b)(3)(B)(i) of the Act was warranted. Notice of this finding was published in the **Federal Register** on April 11, 1991 (56 FR 14678). A proposed rule to list the Mexican spotted owl as threatened without critical habitat was published in the **Federal Register** on November 4, 1991 (56 FR 56344).

In the November 4, 1991, proposed rule and associated notifications, all interested parties were requested to submit factual reports or information regarding whether the Mexican spotted owl should be listed. The comment period was reopened from May 11, 1992, to September 1, 1992 (57 FR 20073, May 11, 1992) to allow submission of additional comments. Appropriate Federal and state agencies, and Tribal and county governments, organizations, and other interested parties were directly contacted and requested to comment, and newspaper notices inviting public comment were published in Arizona, New Mexico, Utah, and Colorado. The Service held six public hearings, which were announced in the proposed rule. A notice of the hearing dates and locations was published in the **Federal Register** on January 2, 1992 (57 FR 35), and in notices published in Arizona, New Mexico, Utah, and Colorado newspapers. Interested parties were directly contacted and notified of the hearings.

After a review of all comments received in response to the proposed rule, the Service published a final rule to list the Mexican spotted owl as a threatened species on March 16, 1993 (58 FR 14248). Section 4(a)(3) of the Act requires that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time a species is determined to be endangered or threatened. The Service's regulations (50 CFR 424.12(a)(2)) state that critical habitat is not determinable if information sufficient to perform required analyses of the impacts of the designation is lacking or if the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat. At the time of listing, the Service found that, although considerable knowledge of Mexican spotted owl habitat needs had been gathered in recent years, habitat maps in sufficient detail to accurately delineate these areas were not available. Subsequent to listing, the Service began gathering the data necessary to develop a proposed rule. On March 17, 1993, letters requesting information on owl habitat and distribution were sent to 14 Federal agencies. On April 14, 1993, letters requesting information on owl habitat and distribution were sent to 37 Tribal agencies.

On June 25, 1993, and again on August 16, 1993, the Service received petitions to remove the Mexican spotted owl from the List of Endangered and Threatened Wildlife. In subsequent petition findings published in the **Federal Register** (58 FR 49467, 59 FR 15361) the Service addressed the issues raised in the petitions and determined that the delisting petitioners did not present substantial information indicating that the delisting of the Mexican spotted owl was warranted.

The petitioners have challenged this decision in Federal District Court in New Mexico in *Coalition of Arizona/ New Mexico Counties for Stable Economic Growth* v. *United States Fish and Wildlife Service, et al.,* CIV 94–1058–MV.

On February 14, 1994, a lawsuit was filed in Federal District Court in Arizona against the Department of the Interior for failure to designate critical habitat for the Mexican spotted owl (*Dr. Robin Silver, et al.* v. *Bruce Babbitt, et al.*, CIV–94–0337–PHX–CAM). On October 6, 1994, the Court ordered the Service to * * * ''publish a proposed designation of critical habitat, including economic exclusion pursuant to 16 U.S.C. 1533(b)(2), no later than December 1, 1994, * * * (and) publish its final designation of critical habitat, following the procedure required by statute and Federal regulations for notice and comment,'' by submitting the final rule to the **Federal Register** no later than May 30, 1995. Pursuant to an extension granted by the court, the Service issued the proposal rule to designate critical habitat on December 7, 1994 (59 FR 63162).

Prior to issuance of the proposed rule, the Service held a press briefing in Albuquerque, New Mexico, on November 30, 1994, announcing the proposal, and issued a press release to major regional newspapers. In addition, the proposed rule was sent to affected Federal, Tribal, state, county, and local agencies and governments, and notice of the availability of the rule were sent to all interested parties on the Service mailing list. Public legal notices of the proposal were also sent to 18 newspapers in Arizona, Colorado, New Mexico and Utah on December 5, 1994. The general and newspaper notices requested data and comments from the government and public on all aspects of the proposal, including data on the economic impacts of the designation. The notice also announced a 90-day comment period open until March 7, 1995.

On December 19, 1994, the Service sent a request for information on the potential economic impacts of designating critical habitat to 13 Federal, 12 Tribal, and 10 state agencies, and 4 Governors' and 42 county government offices. A Draft Economic Analysis (DEA) was prepared based on the information received and notice of its availability was published in the **Federal Register** on March 8, 1995 (60 FR 12728, 60 FR 12730). The publication also proposed several revisions to the original proposal, solicited additional information and comments, opened an additional 60-day comment period extending to May 8, 1995, and announced the schedule and location of public hearings. More than 700 parties on the Service's mailing list also received an announcement of the above subjects. On February 23, 1995, the Service also sent for publication as legal notices in 36 regional newspapers an announcement of the availability of the DEA, solicitation for additional information and comments, the opening of the additional comment period, and the schedule and location of public hearings. Public hearings were held in Santa Fe and Socorro, New Mexico, on March 22 and 23, 1995, and Tucson and Flagstaff, Arizona, on March 29 and 30, 1995. Comments from the public on the critical habitat proposal and DEA were recorded and evaluated for input to the final designation. More than 800 letters addressing the proposal were received during the comment periods. The correspondence and comments have been evaluated in the decision whether to designate critical habitat. Numerous other Federal actions have occurred in relation to the Mexican spotted owl, including the Service's recovery planning effort, plus management actions by other Federal agencies. Those topics are discussed under ''*Management Considerations*'', below.

Habitat Characteristics

The physical and biological habitat features essential to the conservation of the Mexican spotted owl, referred to as the primary constituent elements, include those that support nesting, roosting, and foraging. These elements were determined from studies of Mexican spotted owl behavior and habitat use throughout the range of the owl.

The vegetative communities and structural attributes used by the owl vary across the range of the subspecies. The vegetative communities consist primarily of warm-temperate and cold-temperate forests, and, to a lesser extent, woodlands and riparian deciduous forests. The mixed-conifer community appears to be most frequently used throughout most portions of its range (Skaggs and Raitt 1988; Ganey and Balda 1989, 1994; Service 1995).

Mixed-conifer forests contain several species of overstory trees. The most common are white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), and ponderosa pine (*Pinus ponderosa*). Less common species are southwestern white pine (*P. strobiformis*), limber pine (*P. flexilis*), aspen (*Populus tremuloides*), and corkbark fir (*Abies lasiocarpa* var. *arizonica*). The understory within mixed-conifer communities provides important roosting sites for Mexican spotted owls. The understory usually contains the same conifer species found in the overstory, with Gambel oak (*Quercus gambelii*), maples (*Acer grandidentatum* and *A. glabrum*), and New Mexico locust (*Robinia neomexicana*) also present. Montane riparian canyon bottoms used by owls in the mixed-conifer zone may contain box elder (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), maples (*Acer* spp.), and alders (*Alnus* spp.).

In southeastern Arizona, owl habitat types include mixed-conifer and Madrean Evergreen Forest and Woodland (Ganey and Balda 1989a; Duncan and Taiz 1992). Below the mixed-conifer vegetative zone are found two series of Madrean Evergreen Woodland: the upper oak-pine occurs at 1,675 to 2,200 meters (5,500 to 7,200 feet), and the lower evergreen oak (encinal) occurs at 1,525 to 1,980 meters (5,000 to 6,500 feet). Within these vegetative zones, and particularly at lower elevations, Mexican spotted owls are usually found in steep, forested canyons with rocky cliffs.

At the northern edge of their range in northeastern Arizona, southwestern Colorado, and southern Utah, Mexican spotted owls occur during the breeding season between 1,340 to 2,160 meters (4,400 to 7,100 feet) in canyon habitats within pinyon-juniper woodland (*Pinus edulis* and *Juniperus osteosperma*) or mixed-conifer forests. Canyon habitat is characterized by the cool, humid conditions found in the deep, steep-walled, fractured structures of sandstone slickrock. Canyons frequently contain riparian and conifer pockets, and adjacent slopes and mesa tops are vegetated by a variety of plant associations. Although no studies have been completed, preliminary studies show most Mexican spotted owl activity during the breeding season to occur within and in proximity to canyons. Owls roost in the riparian and coniferous pockets of canyon bottoms, on ledges, or in cavities in the slickrock canyon walls (Gutiérrez and Rinkevich 1991; van Riper and Willey 1992).

Structural characteristics associated with forested Mexican spotted owl habitat vary depending on the behavioral function it supports. Although Mexican spotted owl habitat is also regionally variable, some general attributes are common to the subspecies' life-history requirements throughout its range. Studies of nest and roost habitat use at both stand and site scales indicate that areas selectively used by owls contain attributes typically associated with older forest stands (Service 1995 and references therein). The attributes of

forested nesting and roosting habitat typically include a high basal area of large diameter trees; a moderate to high canopy closure; a pronounced large-tree component; a wide range of tree sizes suggestive of uneven-age stands; a multi-layered canopy with large overstory trees of various species; high plant species richness; high snag basal area; and high volumes of fallen trees and other woody debris. These attributes usually develop with increasing forest age, but their occurrence may vary by location, past forest management practices or disturbance events, forest type, and productivity. These characteristics may also develop in younger stands, especially when the stands contain remnant large trees or patches of large trees from earlier stands. Certain forest management practices may also enhance tree growth and mature stand characteristics where the older, larger trees are allowed to persist.

Spotted owls apparently use a wider array of habitat types for foraging than for nesting and roosting, including fairly open and non-contiguous forest, small openings, pure ponderosa pine stands, woodland, and rocky slopes. Ganey and Balda (1994) found a greater selectivity in forested habitat used for foraging than for random sample sites. As for roosting sites, foraging areas had larger logs, greater canopy cover, and higher densities and basal areas of both trees and snags than random sites. Owls also appeared to avoid foraging in stands in which the overstory had been partially harvested. However, the significance of this analysis may be low because of the limited sample size.

Little is known about the habitat requirements for dispersal. Habitat that meets the subspecies' needs for nesting and roosting may also provide for foraging and dispersal. The definition of the term ''dispersal'' is frequently limited to post-fledging movements of juveniles. For the purposes of this rule, the Service considers the term to include all movement, including winter shifts in territory and dispersal from natal areas, and to encompass the important biological concepts of connectivity within and between clusters of Mexican spotted owl territories. Although habitat that allows for dispersal may be marginal or unsuitable for nesting or roosting, it provides connectivity between blocks of nesting habitat both locally and over the Mexican spotted owl's range that is essential to demographic interaction and genetic flow. Thus, dispersal habitat includes unoccupied habitat of varying quality that may support intermittent use as a ''stepping stone'' between occupied areas.

Mexican spotted owls occur in relatively isolated mountain ranges, often separated by wide expanses of Sonoran, Chihuahuan, and Great Basin desert and other nonforested lands. Preliminary studies of juvenile owl dispersal in southern Utah (Willey 1993) and New Mexico (Peter Stacey, University of Nevada, Reno, *in litt.*, 1993) have shown movements across a wide variety of habitat types, including both riparian areas and vegetation types considered too open for consistent use by Mexican spotted owls.

The results of a 3 year telemetry study of owls and habitat in southern Utah have shown seasonal shifts in habitat use (van Riper and Willey 1992, Willey 1993). During the breeding season, up to 25 percent of adult owl locations occurred outside of steep canyon terrain. During the fall and winter seasons, about half of the locations occurred on mesa-tops, benches, and warm slopes above the canyons. Movements out of the summer home ranges during the winter season were highly variable. A few owls moved completely out of their summer ranges, several shifted into adjacent areas with some overlap of seasonal ranges, and others remained within the same area year round.

Current Situation

Federal, state, Tribal, and private lands contain habitat for the owl. The Forest Service, Bureau of Indian Affairs (BIA), National Park Service (NPS), Bureau of Land Management (BLM), and Department of Defense are the Federal land managing agencies for much of the lands harboring owl habitat and known owl sites. Efforts to estimate habitat acreage and survey efforts for owls have varied between agencies, with the most intensive work being done by the Forest Service.

Currently, most land-managing agencies characterize Mexican spotted owl habitat under the term ''suitable.'' Suitable habitat is often only applied to habitat able to sustain the combined nesting, roosting, and foraging needs of the Mexican spotted owl's life history. The definition often excludes additional habitat utilized only for foraging, and may underestimate the total habitat available within an owl territory and across the subspecies' range.

The Forest Service estimates that it manages about 1,853,000 ha (4,579,000 acres) of suitable owl habitat on 18 national forests in Arizona, New Mexico, Utah, and Colorado (Fletcher and Hollins 1994). Forest Service land in Arizona and New Mexico contains 1,161,000 ha (2,869,000 acres) of this total, with an additional 432,400 ha (1,068,500 acres) described as being ''capable'' of returning to suitable habitat condition. Colorado national forests are estimated to have about 355,300 ha (878,000 acres) and Utah national forests are estimated to have about 336,700 ha (832,000 acres) of forested suitable habitat. However, under a narrower set of definitions, a second recent estimate places suitable canyon habitat in Utah national forests at about 58,000 ha (143,000 acres) (Kate Grandison, Dixie National Forest, *in litt.*, 1994). No capable acreage figure is available for Utah and Colorado. Addition of the capable habitat figure yields a total owl habitat acreage of 1,593,500 ha (3,937,500 acres) for Forest Service lands in Arizona and New Mexico.

Forest Service inventories through 1994 resulted in the establishment of 841 management territories (MTs) in Arizona and New Mexico (Fletcher and Hollis 1994). Four MTs have been established from the six sites with owl detection records in Utah (K. Grandison, pers. comm., 1994). No MTs have been established from the six owl sites in Colorado (John Verner, Pike/San Isabel National Forests, pers. comm., 1994). Each MT represents the occurrence of either a single owl or pair of owls, and was either established from confirmed nest or roost locations, or from nighttime calling responses.

There are potentially up to 435,000 ha (1,075,000 acres) of Mexican spotted owl habitat on Indian reservations. The actual amount of habitat may be lower because estimates may be developed from forest cover timber-type maps containing little information about understory conditions or slope. On the other hand, the estimates may also omit minimally or non-forested canyon habitat acreage. Complete information is not available on owl survey efforts or results from several Tribes. As of the end of 1992, seven owl sites (three pairs and four singles) have been located on the Fort Apache Indian Reservation (White Mountain Apache Tribe, *in litt.*, 1993). No recent estimates were made available by the Tribe. Owl surveys on the Navajo Reservation have resulted in the confirmation of owls at 26 sites (13 pairs and 13 singles) (John Nysted, Navajo Fish and Wildlife Department, pers. comm., 1994). The Jicarilla and the Hualapai wildlife departments have conducted owl surveys; however, no owls have been detected. Current owl records exist, but only limited information is available on population estimates for the San Carlos Apache and Mescalero Apache Indian Reservations.

Only limited information specific to the Southern Ute Indian Reservation is available; however, presently the are no known owls, although occupied habitat on adjacent lands indicate owls may occur on Reservation land.

A total of 297,000 ha (734,000 acres) of potential owl habitat occurs on BLM lands in Colorado, Utah, Arizona, and New Mexico (BLM, Colorado State Office, *in litt.* 1990; BLM, Utah State Office, *in litt.* 1990; BLM, New Mexico State Office, *in litt.* 1990; Ted Cordery, Arizona BLM, pers. comm., 1992). In 1993, a total of 25 owl locations were known from BLM lands. There were 15 locations in Utah, 7 locations in Colorado, and 1 location in New Mexico. There are several historical records and two current records for sites on BLM lands in Arizona.

Most Mexican spotted owl habitat on national parks and monuments consists of minimally forested, steep, shaded canyons in the northern part of the owl's range. It is difficult to estimate acreage for this type of habitat. The NPS estimated that 23 parks and monuments in the southwest contained between 96,000 and 177,000 ha (238,000 to 438,000 acres) of Mexican spotted owl habitat (NPS, Southwest Region, *in litt.* 1990; NPS, Rocky Mountain Region, *in litt.* 1990; J. Ray, NPS, Grand Canyon National Park, pers. comm., 1990). As of 1995, the NPS had records for a total of 37 sites in Utah, Colorado, and New Mexico (NPS, unpublished data). No recent records were available for NPS land in Arizona.

Between 72,000 and 82,000 ha (177,000 to 202,000 acres) of New Mexico and Arizona State lands contain forests and canyons that could be suitable Mexican spotted owl habitat. Several historical and recent records exist for New Mexico State lands. In Arizona, surveys conducted by the Arizona State Land Department and the Coconino National Forest resulted in the establishment of three MTs. No information was available on suitable Mexican spotted owl habitat on State lands in Utah and Colorado. However, a single owl was recorded on Utah State lands in 1992.

Private lands in Arizona and New Mexico are currently estimated to contain up to 53,000 ha (130,000 acres) of owl habitat (Service 1994). No estimates exist for owl habitat acreage on private lands in Colorado and Utah. This is partly due to the difficulty in assessing the extent of existing canyon habitat in the Colorado Plateau physiographic province, and partly a result of the insufficient amount of owl surveys currently accomplished to accurately determine the limit of the subspecies' range.

The estimates, as reported by individual land managing agencies, of Mexican spotted owl suitable habitat within the United States total about 2,959,400 ha (7,312,500 acres). These estimates of habitat available for nesting and roosting activity are derived from median figures where estimates were given as an acreage range, include capable habitat estimates where available, and include the lower estimate for suitable habitat on Forest Service land in Utah. The approximate proportion of habitat for the Forest Service is 68 percent; Tribal, 15 percent; BLM, 10 percent; NPS, 5 percent; the States of Arizona and New Mexico, 1 percent; and private lands, 2 percent.

The proportion of total habitat for each landowner is probably fairly accurate. However, the total acreage of owl habitat is likely overestimated. The error is a result of inadequate information on land status and disagreement about the types of vegetative communities that provide owl habitat. For instance, the Forest Service included many acres of the ponderosa pine community type in its estimate of suitable and capable habitat. Several agencies expressed uncertainty about the accuracy of their habitat estimates.

Ninety-one percent of Mexican spotted owls known at the end of 1990 occurred on national forests, 4 percent on Indian reservations, 4 percent on national parks, and 1 percent on BLM lands. Because the Service has received incomplete 1991 to 1994 survey data, it is not possible to identify exact percentages since 1990.

Definition of Critical Habitat

Critical habitat is defined in section 3(5)(A) of the Act as: ''(i) the specific areas within the geographic area occupied by a species * * * on which are found those physical and biological features (I) essential to the conservation of the species, and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species.'' The term ''conservation,'' as defined in section 3(3) of the Act, means ''* * * to use and the use of all methods and procedures which are necessary to bring an endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary,'' i.e., the species is recovered and removed from the list of endangered and threatened species.

The Service is required to base critical habitat designations upon the best scientific and commercial data available (50 CFR 424.12) after taking into account economic impacts and other relevant data. In designating critical habitat for the Mexican spotted owl, the Service has reviewed the overall approach to the conservation of the Mexican spotted owl undertaken by land management agencies since its proposed listing in 1991. The Service has also reviewed available information that pertains to the habitat requirements of this subspecies, including material received during the public comment periods from state and Federal agencies, and other entities. Finally, the Service considered the economic and other relevant impacts of designation prior to making this final determination.

Role in Species Conservation

The use of the term ''conservation'' in the definition of critical habitat indicates that its designation should identify lands needed for a species' eventual recovery and delisting. However, when critical habitat is proposed or designated at the time a species is listed, the Service frequently does not know precisely what may be needed for recovery. In this regard, critical habitat serves to preserve options for a species' eventual recovery.

The designation of critical habitat will not, in itself, lead to recovery, but, through regulations under section 7 of the Act, may assist the Service and all Federal agencies in preventing the further deterioration of habitat and, in this way, contributing toward a species' conservation. Critical habitat helps focus conservation activities by identifying areas that contain essential habitat features (primary constituent elements), regardless of whether they are currently occupied by the listed species, thus alerting the public and land managing agencies to the importance of an area in the conservation of a listed species. Critical habitat also identifies areas that may require special management or protection. Critical habitat receives protection from destruction or adverse modification through required consultation under section 7 of the Act with regard to actions carried out, funded, or authorized by a Federal agency. Aside from the added protection provided under section 7, the Act does not provide other forms of protection to lands designated as critical habitat. The added protection of these areas may shorten the time needed to achieve recovery.

Designating critical habitat does not create a management plan for a listed species. Designation does not establish numerical population goals, prescribe specific management actions (inside or outside of critical habitat), nor does it have a direct effect on areas not designated as critical habitat. Recovery planning and critical habitat designation are different processes. Specific management recommendations for critical habitat are most appropriately addressed in recovery plans, management plans, and through section 7 consultation.

Critical habitat identifies specific areas essential to the conservation of a species. Areas not currently containing all of the essential features, but with the capability to do so in the future, may also be essential for the long-term recovery of the species, particularly in certain portions of its range, and may be designated as critical habitat. However, not all areas containing the features of a listed species' habitat are necessarily essential to the species' survival. Areas not included in critical habitat that contain one or more of the primary constituent elements are still important to a species' conservation and may be addressed under other facets of the Act, and other conservation laws and regulations.

Primary Constituent Elements

In identifying areas as critical habitat, the Service considers those physical and biological attributes that are essential to a species' conservation. In addition, the Act stipulates that the areas containing these elements may require special management considerations or protection. Such physical and biological features, as outlined in 50 CFR 424.12, include, but are not limited to, the following:

—Space for individual and population growth, and for normal behavior;
—Food, water, or other nutritional or physiological requirements;
—Cover or shelter;
—Sites for breeding, reproduction, or rearing of offspring; and
—Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The primary constituent elements of critical habitat for the Mexican spotted owl include, but are not limited to, those habitat components providing or with the potential to provide for nesting, roosting, or foraging activities. Forested habitats used for nesting and roosting are typically characterized as supporting mature stand attributes including high canopy closure, multi-canopied structure, coniferous vegetation (sometimes including a hardwood understory), large diameter trees, high basal areas of live trees and snags, and high log volumes. Nesting and roosting habitat also supports owl foraging activity; however, a wider array of habitat attributes may be found in areas used solely for foraging, including fairly open and non-contiguous forest, small openings, woodland, and rocky slopes. Canyon habitat is typically characterized by the cool, humid conditions found in deep, steep-walled, fractured structures. Canyons frequently contain riparian and conifer pockets, and adjacent slopes and mesa tops are vegetated by a variety of plant associations. Owl habitat may also exhibit a combination of attributes between the forested and canyon habitat types. Habitat that meets the subspecies' needs for nesting, roosting, and foraging also provides for dispersal. However, habitat that provides for dispersal may not support the other primary constituent elements. Currently, little is known about the habitat requirements for foraging or dispersal.

Areas of designated critical habitat include both ''suitable'' and ''unsuitable'' forest and canyon habitat. Several definitions of ''suitable'' are currently used by different land managing agencies; however, the term ''suitable'' generally refers to habitat that supports the combined activities of nesting, roosting, and foraging. This critical habitat designation is not limited to habitat that meets ''suitable'' definitions, but includes habitat with any of the primary constituent elements described above.

Criteria for Identifying Candidate Critical Habitat Units

The primary objective in designating critical habitat is to identify existing and potential Mexican spotted owl habitat considered essential for the conservation of the subspecies, and to highlight specific areas where management considerations should be given highest priority. The Service focused on available nesting and roosting habitat to identify locales that provide a nucleus for delineation of critical habitat units. Additional habitat was added as needed to develop units based on the criteria described below. In the designation of critical habitat, the Service has considered all habitat types needed by the subspecies through its definition of the primary constituent elements.

The Service used owl habitat and territory maps, vegetation maps, aerial photography, and field verification to identify areas for designation as critical habitat. Because habitat maps available to the Service were generally based on the varying definitions of ''suitable habitat'' used by the agencies, the major focus was on habitat that provides nesting, roosting, and some foraging attributes. To assist in these determinations, the Service relied upon the following principles developed by the Interagency Scientific Committee (Thomas *et al.* 1990) for the northern spotted owl, and by others working in the field of conservation biology:

—Develop and maintain large contiguous blocks of habitat to support multiple reproducing pairs of owls;
—Minimize fragmentation and edge effect to improve habitat quality;
—Minimize distance between blocks to facilitate dispersal among blocks of breeding habitat; and
—Maintain range-wide distribution of habitat to facilitate recovery.

Several qualitative criteria were considered when determining identification of critical habitat. The following discussion describes the criteria and provides an explanation of their use in selecting and designating specific areas.

(1) *Currently Suitable Habitat:* The Service concentrated on the existence of currently suitable Mexican spotted owl forested and canyon habitat (primarily nesting and roosting, but also foraging) that contained one or more of the primary constituent elements. The Service evaluated the quality of existing habitat based on available habitat maps and delineated the best available habitat (i.e., the least fragmented, most contiguous forest habitat areas; areas showing characteristic topographic features of canyon habitat) in the critical habitat units.

(2) *Large Contiguous Blocks of Habitat:* The Service identified, where available, large, contiguous blocks of habitat or areas that mostly consist of Mexican spotted owl habitat. In forested habitat, areas were selected so that critical habitat units would include as little low quality habitat as possible. In canyon habitat, drainage systems and adjacent terrain determined the branching shape of critical habitat units.

(3) *Occupied Habitat:* In evaluating potential critical habitat units, the Service gave primary consideration to habitat currently occupied by pairs or resident singles; however, some unoccupied areas were selected if they were important for other reasons (e.g., territory cluster contiguity). Some habitat within units was selected based on suitability although no surveys were yet conducted. All areas selected,

however, have potential for supporting the territorial needs of Mexican spotted owls.

(4) *Rangewide Distribution:* The Service is designating critical habitat units well distributed within the existing United States range of the Mexican spotted owl to maintain demographic connectivity and genetic variation between territory clusters.

(5) *Special Management or Protection:* The Service evaluated the need for special management because of the existing situation (e.g., current quality of existing habitat), low population density, the relative importance of territory clusters, or management activities and threats. All areas were selected because of their need for special management or protection.

(6) *Adequacy of Existing Regulatory Mechanisms:* The Service considered the existing legal status of areas (i.e., reserved areas such as wilderness or parks) and, with few exceptions, has not designated reserved areas as critical habitat. In general, the current classification of wilderness areas and parks provides adequate protection against potential habitat-altering activities because they are primarily managed as natural ecosystems. These lands are often essential to the conservation of the subspecies, as they provide important links and contain large areas of habitat in relatively pristine condition. However, these lands by themselves do not provide adequate habitat to support a viable range-wide Mexican spotted owl population. The Service considered their relative contribution to the Mexican spotted owl's conservation but did not include them in critical habitat because of the protection afforded by their current classification unless there was a threat of significant impacts to habitat in these areas or they were inclusions within larger surrounding critical habitat units.

Critical Habitat Designation

The designation includes 107 critical habitat units totaling 1,874,935 ha (4,632,901 acres) in Arizona, New Mexico, Utah and Colorado. The approximate acreage of critical habitat by land ownership is shown in Table 1.

TABLE 1.—CRITICAL HABITAT ACREAGE BY LAND OWNERSHIP AND STATE

	Arizona	New Mexico	Colorado	Utah	Total
Forest Service	1,510,148	[a] 1,848,351	34,500	188,386	[a] 3,581,385
Bureau of Land Management	0	10,743	562	72	11,377
National Park Service	45,892	0	0	0	45,892
Department of Defense	2,013	0	0	0	2,013
State	3,333	5,847	620	20	9,820
Tribal	401,829	[b] 407,604	61,531	0	[b] 870,964
Private	28,396	[b] 75,621	6,890	543	[a] 111,450
Total	1,991,611	[a b] 2,348,166	104,103	189,021	[a b] 4,632,901
Total critical habitat units	38	62	7	1	[c] 107

[a] Includes a correction to acreages cited in the proposed rule.
[b] Includes changes to ownership and deletion of Jicarilla Apache acreages cited in the proposed rule.
[c] One critical habitat unit overlaps two States.

Management Considerations

Forest Practices

Management direction for lands with Mexican spotted owl habitat varies within and between agencies. A multiple-use management emphasis is in effect on much of Forest Service and Tribally managed land. Much BLM Mexican spotted owl habitat is managed primarily for natural resources extraction, including oil, gas, minerals, and timber, but is still available for wildlife and recreation. National Park Service lands are managed for recreation and preservation of natural values. State lands within owl habitat are typically intermingled with Federal lands and are usually not large enough to support owl territories of their own. State lands are managed to generate maximum financial return to the State trusts. Management emphasis on private lands providing Mexican spotted owl habitat varies.

Current Forest Service management plans call for harvestable timber land in Arizona and New Mexico to be primarily managed under even-aged shelterwood systems. Commercial forests on the Navajo Indian Reservation are being converted to shelterwood management (James Carter, BIA, pers. comm., 1990). Other commercial forests on Indian lands in the Southwest are managed primarily as uneven-aged stands by selective logging. Under the shelterwood system, a stand is scheduled for a series of harvests culminating in a full rotation cycle in 120 years or less. This cycle maximizes timber production, but does not provide enough time for stands to reach the mature to old-growth conditions characteristic of most forested Mexican spotted owl habitat, and results in forest age distributions unnaturally skewed toward younger stands. The past and threatened conversion of complex structured forest stands to even-aged stands was identified by the Service (Service 1991, 1993, 1995) as the greatest threat facing the Mexican spotted owl.

Half of all shelterwood management on national forests has been occurring in forest habitat suitable for nesting and foraging. The Service has determined habitat loss trends from current national forest plans, which provide the only available data on timber harvest trends into the future. An estimated 0.4 percent of Mexican spotted owl habitat is projected to be made unsuitable for breeding each year in the future if timber extraction continues as outlined under current forest plans.

Region 3 of the Forest Service is currently in the process of amending forest plans to incorporate the recommendations contained in the Service's draft Mexican Spotted Owl Recovery Plan (Service 1995), and to change the dominant silvicultural system in the southwest from even- to uneven-age management. Uneven-aged management maintains and promotes development of complex forest structures. Methods include individual tree selection and group selection. Individual tree selection entails the harvest of trees selected from a size-distribution curve appropriate for forest type, site conditions, and desired regeneration levels. Trees of various size and age classes are retained, and multi-storied attributes and vertical diversity are maintained. Group selection creates

openings in the forest stand from a fraction to a hectare (¼ to 2.5 acres) in size, developing small even-aged clumps of trees and within-stand horizontal diversity. The Service considers the use of uneven-age management the silvicultural method most compatible with maintenance of Mexican spotted owl habitat.

Previous Management Attempts

Prior to listing, the Migratory Bird Treaty Act (MBTA) provided the only Federal statutory protection for the Mexican spotted owl. Under the provisions of the MBTA, it is unlawful to pursue, hunt, take, capture, or kill in any manner any migratory bird unless permitted by regulations. Although the Mexican spotted owl typically remains in its summer range throughout the year, it is included on the list of birds protected under the MBTA.

An interagency agreement with the purpose of ensuring population viability of the spotted owl (*Strix occidentalis*), including the Mexican spotted owl, was signed by the Service, BLM, NPS, and Forest Service on August 12, 1988 (U.S. Department of Interior 1988). Under this agreement, each agency agreed to manage its lands to provide owl habitat, to carry out habitat and population inventories sufficient to indicate long term trends, and to carry out research activities sufficient to provide empirical information on the validity of planning assumptions. The degree to which this agreement has been implemented has varied within and among agencies.

The States of Arizona, Utah and Colorado list the Mexican spotted owl as a threatened species. Capture, handling, transportation, and take of the Mexican spotted owl are regulated by game laws and special licenses for live wildlife. Thus, the States only regulate hunting, recreation, and scientific investigation. Habitat management is not considered.

Most Federal agencies have policies to protect State threatened or endangered species, and some agencies also protect species that are candidates for Federal listing. The NPS Organic Act protects all wildlife on national parks and monuments. However, these general policies lack standards and guidelines that can be used to measure policy success. The Service believes that until agencies develop specific protection guidelines, evaluate them for adequacy, and test them through implementation, it is uncertain whether any general agency policies will adequately protect the Mexican spotted owl.

Specific management policies for the Mexican spotted owl have been developed by BLM in Colorado and New Mexico. The policy in Colorado states, ''In areas with a confirmed nest or roost site, surface management activities will be limited and will be determined on a case by case basis to allow as much flexibility as possible outside of the core area.'' Management policy in New Mexico states that habitat core areas and territories of appropriate size will be established and preserved wherever owls are found. The Service believes these policies are likely to be too general to ensure the Mexican spotted owl will be adequately protected on BLM lands.

Mexican spotted owl protection guidelines have been developed by the White Mountain Apache, Mescalero Apache, and Jicarilla Apache Tribes. The White Mountain Apache Mexican Spotted Owl Management Plan was discussed in some detail in the proposed rule for critical habitat designation. Details of the Mescalero Apache conservation plan are considered proprietary by the Tribe and are not available for release by the Service. The Jicarilla Apache conservation plan addresses the identified threats to owl habitat by maintaining sufficient suitable habitat across the landscape and the site-specific retention of complex forest structure following timber harvest. Nest/roost habitat, primarily mixed conifer and steep slope areas, are not managed for timber extraction and are to remain in suitable nest-roost condition. Foraging habitat consisting of ponderosa pine is to be managed almost entirely by uneven-aged methods. Timber harvest may lower the quality of a fraction of the foraging habitat base, but adequate residual structure remains such that the habitat rapidly reattains suitable condition. At any point in time the majority of foraging habitat remains in suitable foraging condition across the landscape. Site-specific management of territories address both habitat conditions and behavioral disturbance within owl territories. Territorial management includes the establishment of 300-acre protected activity centers around nest-roost sites. No timber, and oil and gas development is to occur within these areas, and no behaviorally disturbing activities are permitted within ¼ mile of any nest or roost site during the breeding season. Habitat in the areas surrounding the protected activity centers are to be managed as described above.

Detailed guidelines for Mexican spotted owl management have been developed by the Forest Service Southwest Region. The guidelines were first issued as Mexican spotted owl Interim Directive (ID) No. 1 in June 1989, and reissued as Mexican spotted owl ID No. 2 in June 1990. Utah and Colorado national forests adopted ID No. 2 in 1991. The guidelines expired December 26, 1991, but the Forest Service is continuing to manage under ID No. 2. The IDs require establishment of a Mexican spotted owl MT around each nest or roost site. Each MT has a core area of 182 ha (450 acres) and an overall size of 810 ha (2,000 acres). Activities within the core area are limited to road construction. Within the MT, activities, including timber harvest, are limited to a maximum of 314 ha (775 acres). The intent of the guidelines is to retain at least 405 ha (1,000 acres) of suitable habitat within the MT after proposed management activities are identified and located. Forest Service estimates indicate that suitable habitat within MTs currently averages 466 ha (1,150 acres) for territories in New Mexico and Arizona. In Utah, MTs encompass 1,340 ha (3,350 acres) with a core of 350 ha (875 acres) (K. Grandison, pers. comm., 1994). The IDs provide no protection for unoccupied suitable Mexican spotted owl habitat, nor do they address forest activities not related to timber harvest.

In March of 1995, the Service released for public review the draft Mexican Spotted Owl Recovery Plan (Service 1995). That plan, when finalized, will become the Service's policy on recommendations for managing Mexican spotted owls in the southwest. As previously mentioned, the Forest Service has shown interest in adopting the recommendations in the recovery plan by amending forest plans for National Forests in Arizona and New Mexico. It is the Service's hope that other involved Federal agencies, including other regions of the Forest Service, will adopt the Service's final recovery recommendations as spotted owl management policy.

Summary of Economic Impacts

The Act requires that critical habitat be designated after consideration of the economic impact, and any other relevant impact, of specifying any specific area as critical habitat. An area may be excluded from designation if the benefits of its exclusion outweigh the benefits of its inclusion in critical habitat, unless failure to designate the area would result in extinction of the species concerned. The Service has analyzed the probable impacts of designating critical habitat for the Mexican spotted owl. Availability of a draft economic analysis was announced in the **Federal Register** on March 8, 1995 (60 FR 12730), simultaneous with publication of a supplementary

proposed rule that proposed to exclude certain areas from critical habitat on economic grounds (60 FR 12728). Pursuant to an order of the United States District Court for the District of Arizona issued December 30, 1994, the Service was required to publish any proposed exclusions from the critical habitat for the Mexican spotted owl in the **Federal Register** and provide a 60-day comment period on them. Consequently, the only areas potentially subject to economic exclusion from this final designation are those treated in the supplementary proposal.

A final economic analysis has now been completed and will soon be made available to the public. Its principal findings are summarized below.

The study estimates the incremental economic effects of designating critical habitat for the owl. It does not estimate the economic benefits and costs related to other conservation measures in place as a result of listing the owl, or the economic effects of actions taken by other Federal or state agencies. The study assesses impacts on activities that occur on Federal land or are authorized, funded, or carried out by agencies of the Federal government. Activities that occur on private lands and that do not involve Federal authorization, funding, or assistance are not affected by critical habitat designation.

Analytical Methodology

The economic region described in the study includes 28 counties in four states that contain land proposed for designation as critical habitat for the owl. The subregions are groups of counties that allow evaluation of economic impacts in a smaller area. The Northeast subregion contains 2 counties in Colorado (Archuleta and La Plata) and 9 in New Mexico (Colfax, Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe, Taos, Torrance). The Southeast subregion comprises two counties in southern New Mexico (Lincoln and Otero). The West subregion is the largest and most populated, and includes 7 counties in Arizona (Apache, Coconino, Gila, Graham, Greenlee, Navajo, and Yavapai), 7 counties in New Mexico (Catron, Cibola, Grant, McKinley, San Juan, Sierra, and Socorro), and 1 in Utah (San Juan).

The economic subregions are defined by county boundaries, which are the smallest economic divisions available for analysis with the database used in the study. The subregions approximate as nearly as possible the counties in which critical habitat has been proposed. The profile of the economy of the region describes economic activity in 1991, prior to Federal listing of the owl and the proposal to designate critical habitat. The economic descriptions and the modeling of economic impacts were conducted primarily with Micro IMPLAN (Taylor et al. 1993) and the Micro IMPLAN database.

The economic analysis is restricted to effects anticipated in the foreseeable future within proposed CHUs. The effects of the proposed action on Federal agencies and other entities were estimated using data requested by the Service from Federal, state, county, and Tribal entities known to be involved in land management or ownership within the counties containing proposed critical habitat. The agencies were asked to estimate current and planned timber harvest that involved modification or destruction of owl habitat and that would be affected by the proposed action.

The economic effects of designation include those that result in changes in social welfare. Regional (distributional) economic impacts may include household income foregone from employees permanently displaced through critical habitat designation; changes in specific county tax revenues due to changes in land use; regional social costs and benefits from factors such as transient unemployment, job training, or redistribution of existing job-mix categories. The analysis of effects of critical habitat designation considers both national economic efficiency effects and regional (distributional) impacts when possible. These include effects on the changes in total employment, changes in household income, and the effects on local communities.

Regional Demographic Profile

Land Ownership

More than three-fourths of the acres proposed for critical habitat designation are federally owned, primarily under jurisdiction of the Forest Service. Much of the remaining land is within the boundaries of Tribal Reservations (20 per cent).

Critical habitat designation for the owl was proposed on 922,600 acres of Native American Tribal lands including land owned by five Tribes: Jicarilla Apache, Mescalero Apache, Navajo, San Carlos Apache, and Southern Ute. Tribal lands are included in CHUs in all three subregions, and represent 17 percent of the total proposed designated critical habitat in the Northeast and West subregions, and 38 percent of the Southeast subregion.

Human Population

The 1990 census reported the region's residents numbered 1,054,800, 20 percent higher than a decade earlier and double the population of 1960. The 1990 census reported 19 counties in the region that each had fewer than 50,000 residents; population exceeded 100,000 in one of the 28 counties in the region.

The region includes six incorporated communities with populations that exceeded 25,000 in 1990, including Flagstaff and Prescott, Arizona; and Alamogordo, Farmington, Rio Rancho, and Santa Fe, New Mexico. Santa Fe was the largest community in the region, reporting a 1990 census of 55,900 residents. The Arizona counties containing Phoenix (Maricopa County) and Tucson (Pima) and the New Mexico county containing Albuquerque (Bernalillo) are excluded from the region defined for this impact analysis because their large economies would substantially deemphasize the economic impacts in the remainder of the region. Pima County, which includes the Tucson metropolitan area, contains almost 34,000 acres proposed for critical habitat designation; however, current Forest Plans do not include timber harvest from the CHUs in Pima County.

Native Americans account for 24 percent of the population in the region, and the 250,000 residents of Native American descent represent 13 percent of the Native Americans in the United States. Residents of Hispanic descent account for 24 percent of the 1990 population in the region, or 258,000 residents.

Regional Economic Profile

Employment

Employment in the Mexican spotted region totaled 451,000 full- and part-time workers in 1991. The most striking characteristic of the region's employment base is the predominance of government employment. Nearly one-quarter (23.7 percent) of all jobs in the region in 1991 were based on Federal, State, and local governments—much higher than the rate of government employment in the national economy. Relative to the national economy, the region provided a higher proportion of employment in the Government, Retail Trade and Mining sectors, and a lower proportion of jobs in the Manufacturing and Services sectors. Employment in the Solid Wood & Paper sector represented 1.1 percent of the region's total job base, nearly matching the national rate of 1.2 percent.

Household Income

Household income totaled $13.9 billion in the region in 1991. The largest proportion of household income, $5.7 billion or 40.8 percent, was provided by sources outside the region, including pensions, government support payments, other ''unearned'' income, and wages paid by firms outside the region (e.g., wages paid to a resident of Sandoval County who works in Bernalillo County). The Government sector generated the second largest proportion of household income in the region (20.1 percent), followed by Services (12.8 percent). The Solid Wood & Paper sector provided $107.9 million in household income (0.8 percent of total) in the region in 1991.

Sales Revenues

Gross sales revenues (including resale of domestic and foreign imports and excepting the Trade sector which reports value added) in the region totaled $27.2 billion in 1991. The Mining sector generated about $4.5 billion in sales (16.6 percent of total), followed by the Services sector, the sales from which totaled $4.3 billion (15.8 percent). The Solid Wood & Paper sector generated $516 million (1.9 percent) of sales revenues in the region in 1991.

Role of Forests in the Region

Forests in the owl's range contribute to the regional economy as timber, a commodity input to the Solid Wood & Paper sector, and nontimber, a recreation resource and contributor to quality of life. The impacts created by commodity uses are market-based and measurable. The second set of impacts are partially nonmarket in nature, and are acknowledged to exist but often are difficult to quantify.

Timber Resources

Few timber harvest data are available for non-Federal lands in the region. The following analysis relates to timber harvest from Forest Service land, unless otherwise noted. Forest Service timber statistics for the Southwestern Region (includes all of Arizona and New Mexico) were used, and thus reflect an area slightly different than the region included in critical habitat. (The Southwestern Region statistics exclude the three counties in Colorado and Utah, and they include more than a dozen counties in Arizona and New Mexico outside the region).

During the last 20 years, timber harvest in the Southwestern Region exhibited two distinct periods, punctuated by the national recession in the early 1980s. From 1975 to 1980, harvest of all timber species averaged 378 million board feet (MMBF) annually. From 1983 to 1989, annual harvest averaged 460 MMBF. Timber harvests declined sharply in 1990 and again in 1993 as changes in forest management policies occurred. In 1990, the Forest Service projected a peak in employment in softwood lumber and plywood industries in the Rocky Mountain region (includes 12 States from Montana to New Mexico) by the turn of the century, with a steady decline in employment thereafter. The Forest Service forecast identified reduced harvest potential and the continued implementation of labor-saving technology as bases for the decline. Timber harvest from the Southwestern Region totaled 141 MMBF in 1993. The Southwestern Region supplied about 5.0 percent of the volume of timber harvested from the western U.S. during the last decade, ranging from 3.5 percent in 1993 (141 MMBF harvested from Arizona and New Mexico) to 5.9 percent in 1992.

The average price of timber harvested from Forest Service land has varied widely since 1975, but it has risen since 1990 (prices not adjusted for inflation). Timber price averaged $48/thousand board feet (MBF) from 1975 to 1990, before doubling to $103/MBF in 1993. Through the first nine months of 1994, 133 MMBF had been harvested with an average price of $113/MBF.

Employment

Timber cutting in the region directly provides employment in timber harvesting and processing industries. Employment also is generated indirectly in firms providing services and supplies to timber-related industries and their employees.

State-wide direct employment in wood industries in Arizona and New Mexico totaled 9,800 jobs in 1990. Direct employment in Solid Wood and Paper industries in the region totaled nearly 4,800 full- and part-time workers in 1991, just over one percent of the total jobs in the region. Sawmills provided the most jobs among Wood industries in 1991, followed by Logging Camps.

Household Income

Household income generated by the Solid Wood and Paper sector in the region totaled approximately $108 million in 1991, less than one percent of the $13.9 billion total household income in the region. Sawmills provided $40 million in household income in 1991 (37 percent of the Solid Wood and Paper sector's total in the region), followed by paper mills with $29 million (27 percent). Logging camps and millwork industries each provided about $11 million in household income in 1991.

Nontimber Forest Uses

Forests in the region support a variety of uses in addition to providing raw materials for wood and paper industries. Recreation, biological diversity, water quality protection, and intrinsic benefits all are generated by forests in the owl range. Some of these activities contribute directly to the regional economy; others are nonmarket impacts that benefit the public without affecting the market economy.

Reduced timber harvest on Federal land may improve natural resource-based recreational opportunities in the owl range if public access is not significantly affected. Recreation activities that depend on water quality (fishing, swimming, and boating), the presence and abundance of wildlife (wildlife viewing and nature study), and the general quality of forest surroundings (motorized and nonmotorized travel for sightseeing, camping, and picnicking) may increase in frequency and value with improved forest quality.

Spending on outdoor recreation by nonresidents brings money into the economy of the region. If the quality of natural resources declines, total spending by residents of the region is unlikely to change significantly; rather, spending will be redistributed from recreation to nonrecreation activities, or residents may increase recreation outside the region. In either case, the reduced quality of natural resources is likely to result in lower recreation expenditures in the region. That portion of spending that relocates outside the region represents a loss of economic activity due to the degradation of natural resources.

Recreational fishing occurred frequently throughout the region in 1991. Approximately 639,000 anglers fished in the region in 1991, recording nearly 4.9 millon angler days. These anglers spent about $50.42 per day, or $245.3 million in the region in 1991. About 196,000 anglers (31 percent) were nonresidents who fished 1.2 million angler days (24 percent) and spent about $88.17 per day, or $104.1 million (44 percent). More than 440,000 resident anglers averaged about $38.32 spending per day during 3.7 million angler days to record $141.2 million total spending.

Net benefits due to recreational fishing can be estimated for these fishing trips. Walsh et al. (1990) summarized net economic benefits for 39 coldwater fishing trips and found

these averaged about $30.62 per day in 1988. Assuming a per-day value of $36.69 ($30.62 adjusted for inflation to 1991 dollars), the 4.9 million fishing-days provided an estimated annual consumer surplus to anglers of $179.8 million in 1991.

Recreational hunting was pursued by 240,000 participants during 1991. These hunters recorded about 1.9 million days while hunting in the region, and spent about $29.49 per day, or $56.0 million during the year. About 48,000 participants (20 percent of total) were nonresidents who hunted 278,000 days (15 percent), averaging about $85.93 per day in expenditures, or $23.9 million annually (43 percent). The 192,000 resident hunters recorded 1.6 million days and spent $19.71 per day, or $31.6 million for the year.

Net benefits from recreational hunting can be estimated for these trips. Walsh et al. (1990) summarized net economic benefits for big-game and small-game hunting. Big-game hunting estimates in 1990 for net value per person per day averaged $45.47 while small-game hunting averaged $30.82. Assuming a daily value for hunting of $49.37 (inflation-adjusted weighted average of big- and small-game hunting), the 1.9 million days provided an estimated annual consumer surplus to hunters of $93.8 million.

Throughout the region in 1991, 884,000 participants observed, photographed, and fed wildlife. Nonresident participants numbered 340,000 (38 percent), while 544,000 participants lived in the region. In total, 4.6 million trips occurred during 7.1 million days in 1991 involving nonconsumptive wildlife activities.

These 884,000 participants spent an average $57.62 per day on nonconsumptive wildlife activities, for a total $50.9 million in 1991. These expenses included items such as field guides, binoculars and spotting scopes, cameras and accessories, bird seed, and feeder boxes. Net benefits can be estimated using the average of $22.20 per person per day obtained by Walsh et al. (1990) for wildlife observation. In 1991, the 7.1 million participant-days, at $26.60 per day ($22.20 adjusted for inflation to 1991 dollars) generated total net benefits for the region of $188.9 million.

A national survey sponsored by the Forest Service in April 1994 found there is strong support for conservation of public forests and preservation of threatened and endangered species. The survey results indicate the public's support for reduced commercial and recreation uses and increased conservation uses of national forests. When asked whether ''threatened and endangered species in American public forests and grasslands should be protected even if it has a negative economic impact on U.S. citizens,'' 61 percent of the survey respondents agreed or strongly agreed, while 24 percent disagreed or strongly disagreed. A larger majority (79 percent) agreed or strongly agreed with the statement ''(l)ong term health of public forest land should not be compromised by the short term need for natural resources.''

The survey indicates the environmental importance of the public lands over commercial uses and concern for future impacts of public forest uses. Eighty-two percent of respondents agreed that ''(t)he primary purpose of managing public forests is to maintain a healthy environment.'' The statement ''(t)he consumer needs of the American public should be satisfied even if the natural resources on public forests are eventually depleted'' elicited disagreement from 73 percent of respondents. Ninety percent of survey participants agreed or strongly agreed that ''(t)he Federal government has the responsibility of conserving public forest resources for future generations,'' and 80 percent agreed that ''(t)he need for the conservation of natural resources on public forest lands will increase in the 21st century.''

Economic Consequences of Designating Critical Habitat for the Mexican Spotted Owl

The Service has identified commercial timber harvest as the primary activity to be curtailed by proposed critical habitat designation, and concluded that activities such as recreational uses, cutting firewood for personal use, and surface disturbances (e.g., minerals extraction) that do not affect standing timber will not be affected by the proposed action. The time constraints under which the Economic Analysis was conducted allowed no independent estimates of timber harvest and little verification of agency responses. With few exceptions, therefore, the economic consequences are based on projections from the respondents outlined below.

Agency Responses

Three scenarios were presented to more than 80 Federal, State, county, and Tribal agencies by the Service in the request for information on economic impacts resulting from the proposed critical habitat designation. Two of the three centered on impacts resulting from changes to timber harvest volumes. ''Alternative 1'' was defined as the current management guidelines or baseline harvest, ''Alternative 2'' described the implementation of the draft Recovery Plan, and ''Alternative 3'' defined additional restrictions associated with the proposed designation of critical habitat above those described in the draft Recovery Plan. Therefore, the Economic Analysis estimates the reduction in timber harvest and accompanying costs in incremental steps, first from baseline harvest to allowable harvest under the draft Recovery Plan and then from that level to allowable harvest with critical habitat designation in place. The Economic Analysis also includes a measurement of impacts that would result from the critical habitat designation if the draft Recovery plan were not implemented, which essentially are the combined impacts on timber harvest under the draft Recovery Plan and critical habitat designation. This range of alternatives was presented to allow the Economic Analysis to fully consider the entire range of economic impacts that could result from the various management approaches to timber harvest.

During the comment period following publication of the proposed rule, there were numerous discussions within and between the Service and the Forest Service regarding various criteria to be used to determine potential effects to the owl and its critical habitat from timber harvest. As a result, Region 2 of the Service issued an interim policy on April 14, 1995, to clarify how section 7 consultations would be conducted. The interim policy stated, ''* * * any activity in compliance with the draft recovery plan should be considered insignificant in terms of effects on the species' recovery and survival.'' and therefore would not be required to undergo formal section 7 consultation. In essence, the policy made protective measures under the draft Recovery Plan and the proposed critical habitat designation equivalent; no additional restrictions would be applied within critical habitat units. Therefore, in the economic analysis, the costs attributable to critical habitat designation in areas managed to implement the Recovery Plan reflect a worst-case scenario, and are greater than what is expected under the interim policy. The costs resulting from the critical habitat designation are expected to be equivalent to those predicted under the draft Recovery Plan. The impacts on timber harvest within the region from the proposed action are presented in Table 2.

TABLE 2.—REDUCTIONS IN TIMBER HARVEST (IN THOUSAND BOARD FEET) FROM MANAGEMENT ALTERNATIVES

	Baseline level	Enaction of the proposed recovery plan	Critical habitat after enaction of the proposed recovery plan	Critical habitat without enaction of the proposed recovery plan
Non-Tribal Timber Harvest:				
Northeast	14,800	(3,400)	(3,400)	(6,800)
Southeast	1,500	(800)	(0)	(800)
West	57,700	(42,200)	(6,800)	(49,000)
Total	74,000	(46,400)	(10,200)	(56,000)
Tribal Timber Harvest:				
Northeast	3,600	(2,700)	(500)	(3,200)
Southeast	6,100	(4,400)	(700)	(5,100)
West	18,700	(10,800)	(7,700)	(17,800)
Total	28,400	(17,900)	(8,200)	(26,100)
Total Timber Harvest:				
Northeast	18,100	(6,100)	(3,900)	(10,000)
Southeast	7,600	(5,200)	(700)	(5,900)
West	76,400	(53,000)	(13,800)	(66,800)
Total	102,400	(64,300)	(18,400)	(82,700)

The following Federal agencies and Tribes responded to the Service's request to estimate impacts resulting from designating critical habitat as proposed.

The Acting Area Director of the Phoenix office of the Bureau of Indian Affairs (BIA) objected to the proposal to designate critical habitat on Tribal lands as ''contrary to policy direction and principles'' of standing agreements. Information he provided regarding possible impacts to the San Carlos Apache Tribe is described below.

The Acting Area Director of the Albuquerque office of the BIA objected to the proposal to designate critical habitat on Tribal lands for several primarily biological reasons. He estimated the impacts of the proposed critical habitat designation on the Jicarilla Apache, Mescalero Apache, and Southern Ute Tribes. His reply regarding timber harvest levels is also described below.

The Bureau of Land Management's (BLM) State offices in Arizona and New Mexico did not foresee economic or other impacts due to the proposed critical habitat designation. The BLM'S Colorado State office identified one area of potential timber harvest, but stated ''there are no current or future plans to harvest or conduct forest operations in the area.'' The area, if accessible, could yield 1.2 MMBF of timber. Because there are no plans to harvest this timber due to access problems, this timber volume was not included in the impact modeling. The Utah State office did not respond to the Service's request for data.

The NPS administers two sites (Canyon de Chelly and Walnut Canyon National Monument) in its Southwest Region that may be affected by the proposed critical habitat designation. The NPS Regional Director identified potential impacts to Native American residents at Canyon de Chelly, but was unable to quantify the effects or estimate the probability of the impacts being realized.

As requested, the Southwestern Region of the Forest Service provided three levels of timber harvest for each National Forest affected by the proposed critical habitat designation.

The Regional Forester from the Rocky Mountain Region (includes Colorado) foresaw no impacts due to critical habitat designation as proposed because no harvest is planned in CHUs.

The Intermountain Region of the Forest Service (includes Utah) did not expect Alternative 2 to impact timber sales, except in very limited areas (along the mesa rims) where mixed conifer occurs. With respect to Alternative 3, an Acting Forest Supervisor responded ''it is difficult to determine the costs and benefits from implementing these prescriptions because similar guidelines are already being considered in order to maintain ecosystem complexity and other rare species.''

The Acting Area Director of the Albuquerque Office of the BIA estimated the effect of the proposed designation on the Jicarilla Apache, Mescalero Apache, and Southern Ute Tribes. The BIA estimated that, currently, 23.5 MMBF are harvested annually from 9,700 acres (2,400 BF/acre), with a value of $7.8 million ($332/MBF). He stressed that Tribes have high unemployment and low per capita annual income, and that 60 percent of the jobs generated by timber harvest on the Reservations are held by Tribal members.

The BIA estimated that 184 jobs and $3.7 million in annual payroll ($20,100 per job annually) would be lost by implementing the proposed Recovery Plan and the proposed designation of critical habitat. The BIA's estimate of harvest quantity impacts to the three Tribes was difficult to evaluate for several reasons: (1) Alternative 1 was defined as the current management, yet the BIA predicted a reduction of harvest from present levels; (2) harvest levels under each alternative were not specified—impacts were stated in terms of protected activity centers (PACs), but the number of PACs was not specified; and (3) the effects for all three Tribes were aggregated. Timber harvests under each alternative were based on reduction patterns derived from other respondents (primarily the Forest Service).

The Southern Ute Tribe's timber harvest averaged about 1.6 MMBF during the last six years. Based on the Tribe's estimate of seven jobs per MMBF, just over 11 jobs per year were

created in the Solid Wood & Paper sector. Administration and reclamation efforts employ another six to nine persons annually, several of whom are Tribal members. For this analysis these are treated as direct jobs in the Solid Wood & Paper sector. The Tribe estimates critical habitat designation will affect about 75 percent of the Southern Ute timber harvest, impacting 1.4 MMBF (allowable harvest) and presumably a similar portion of jobs. This represents a slight increase of job losses (and a corresponding impact to income and revenues) from impacts originally estimated using data from the BIA.

The impact analysis assumes the timber harvested was processed in the counties according to the BIA reply. Two of the mills were located in Otero County, at which the timber (13.5 MMBF) from the Mescalero Apache Reservation was assumed to be processed. The remaining 10 MMBF were processed in Rio Arriba County and assumed to be harvested from the Southern Ute or Jicarilla Apache Reservations.

The current timber program of the Navajo Nation produced 12.4 MMBF in 1994 from the Chuska/Tsaile forest (within proposed critical habitat), and 6.7 MMBF from the Defiance Plateau forest (outside proposed critical habitat). This 19.1 MMBF of annual timber harvest was processed by the Navajo Forest Products Industry (NFPI) mill in Navajo, New Mexico, which provided 130 direct jobs before its temporary closure in July 1994 (approximately seven jobs per MMBF). The NFPI mill closed in July 1994 because the Navajo Nation Ten Year Forest Management Plan [FMP] was not complete. All timber harvest on the Navajo Nation has ceased until the FMP is complete, which is estimated to be around June or July 1996. The Navajo Nation reports that ''18 million board feet is needed for NFPI to operate feasibly'' and that critical habitat designation would reduce timber harvest below this level. The NFPI attempted to remain open (prior to closing in mid-1994) by purchasing timber outside of the Navajo Nation, but was unable to do so. Current Navajo Nation policies prohibit selling timber off the Reservation.

The Navajo Nation estimated that implementing the proposed Recovery Plan (Alternative 2) would reduce timber harvest from the Chuska/Tsaile forest to 6.2 MMBF (50 percent reduction), reducing potential timber harvest to 12.9 MMBF annually (including the undiminished harvest from the Defiance Plateau), a harvest level too low for the NFPI mill to operate. According to the Tribe, designating critical habitat as proposed will eliminate all harvest from the Chuska/Tsaile forest, thereby reducing the Nation's potential timber harvest to 6.7 MMBF (the harvest from the Defiance Plateau), also too low for the NFPI mill to operate profitably.

Per capita income in the Navajo Nation totaled $5,300 in 1994, much lower than the national average of $18,700 in 1990 (U.S. Bureau of the Census 1994). Unemployment in the Navajo Nation measured nearly 39 percent in 1992, sharply higher than the 28 percent rate in 1990, and matching the 39 percent unemployment in 1980. The Solid Wood & Paper sector provided 1.5 percent of employment to the Navajo Nation in 1992, a level slightly higher than regional (1.1 percent) and national (1.2 percent) proportions of the preceding year. Information provided by the Navajo Nation indicates the proportion of employment of wood-related employment was considerably lower by 1994. The NFPI mill was the 10th largest employer in the Navajo Nation before its temporary closure in mid-1994.

For purposes of the analysis, the sequence of implementation of management alternatives is essential to estimating the effects of critical habitat designation to the Navajo Nation. If the Recovery Plan is implemented *before* critical habitat designation (Alternative 2), the Nation's timber harvest already will have fallen to 12.9 MMBF, resulting in the closure of NFPI. Because the mill already will have closed (or not reopened) due to insufficient harvest, and timber is not sold off the Reservation, there would be no incremental effect of the designation. However, if critical habitat were designated first, the Navajo Nation timber harvest would fall from 19.1 MMBF to 6.7 MMBF—and the effects of the mill closure (or failure to reopen) would be attributable to the designation. These scenarios assume the mill's closure is temporary and will reopen upon approval of the FMP.

The proposed designation was estimated to disrupt timber availability to the San Carlos Apache sawmill, thereby possibly causing the enterprise's closure and loss of 31 Tribal jobs. Closing the sawmill would ''impair economic development [of the Tribe] beyond the sawmill enterprise.'' Neither the BIA nor the San Carlos Apache Tribe provided estimates of timber harvest under the three scenarios. The impact analysis assumes that harvest levels on the San Carlos Reservation are affected in proportions similar to those in other forests in the region.

Several state or county agencies provided information to the Service, as described below.

The Arizona Game and Fish Department concluded that it would not be affected by the proposed action.

The Arizona State Land Department (ASLD) identified four timber product sales that might be affected by designating critical habitat as proposed for the owl, one of which is planned for sale in 1995 and three of which will be sold in consecutive years beginning in 2007. According to the ASLD, none of the sales is ''likely to adversely affect the MSO.'' The impact analysis reflects the ASLD response that designating critical habitat for the owl will not affect timber harvest on Arizona State lands.

Graham County, Arizona estimated direct, indirect, and induced impacts totaling nearly $37 million due to factors ranging from reduced Federal timber harvest to decreased livestock grazing to canceled campground expansions. The impacts identified by the County included effects from spending multipliers, lost wages from displaced workers, and forfeited county share of Federal receipts. Because most impacts were site-specific the Arizona Ecological Services State Office reviewed the County's projections, and provided the following comments:

(1) The County estimated impacts of $24 million due to canceling construction-expansion on 8.6 acres at the Steward Observatory. Informal consultations in November 1993 on a portion of the 24-acre Observatory site had resulted in a '''not likely to adversely affect''' finding for the owl. If the Service conducted a section 7 consultation on the Steward Observatory project, it would be highly unlikely that an ''adverse modification'' determination would be made for these proposed actions; therefore only discretionary recommendations would be given by the Service. The action agency may choose whether or not to implement these recommendations.

(2) The County estimated impacts of $12 million due to canceling construction activities at Discovery Park, including a new visitor center and its access road. The visitor center is understood to be planned outside forested habitat, however, and therefore will not have an effect on proposed critical habitat. Repaving Discovery Trail in its existing road bed would not cause direct loss of critical habitat, while widening or realignment of the road would likely cause some habitat loss, but it is highly unlikely that enough habitat would be affected for

adverse modification to occur. Thus, only discretionary recommendations would likely be given.

(3) Impacts to timber harvesting (Federal timber and firewood use) will cost Graham County $78,000 annually in gross timber sale revenues, according to the County. Federal impacts are discussed above. Firewood harvest should not be impacted by designating critical habitat, and extractive use of small and mid-diameter trees is not a component that has been limited as a result of Service review and recommendations. In fact, projects (such as thinning and prescribed fire) that have sought to address some of the structural changes resulting in increased fire danger have been strongly encouraged by the Service.

(4) Graham County estimated impacts of $179,000 annually to electronic sites at Heliograph Peak due to the ''potential to adversely affect the communications industry.'' The existing electronic sites at Heliograph Peak are on a small unforested site, however, and given the site characteristics it would appear that no habitat modifying activity would be necessary to continue to operate this facility. There thus should be no effect attributable to critical habitat.

(5) The County estimated impacts to grazing would cost Graham County $445,000 annually. However, at this time there is no direct evidence that grazing adversely affects Mexican spotted owl critical habitat, and thus grazing allotments should not be affected by critical habitat designation. Further, the Service has not required discontinuation of grazing to protect the owl in any action related to critical habitat designation.

(6) The County estimated canceling expansions at three campgrounds would cause impacts of more than $120,000 annually. The sites may be affected by critical habitat designation, depending on their location and size. One of the three campgrounds identified by the County was issued an incidental take permit during previous formal consultations. The other two campgrounds could, but are not likely to, adversely modify critical habitat.

Graham County likely will incur added costs due to project redesigns or added costs of consultation, but these presently are not quantifiable. The impact to Graham County from reduced commercial timber harvest on Federal land as identified by the Forest Service is described below under ''Economic Impacts and Effects.''

Assessing the potential impacts to private landowners requires separation of the effects due to listing the owl and those of designation of critical habitat. Activities on private lands are affected by the designation only when a Federal nexus exists, such as mandatory authorization or permits, or when Federal funding is involved. Given that commercial timber harvest is the primary activity affected by the designation, private landowners are unlikely to be impacted by the proposal. None of the Federal agencies contacted by the Service identified ways in which private landowners might be affected indirectly by the proposed action.

Economic Impacts and Effects

The following are estimates of short-term consequences of the proposed designation of critical habitat for the Mexican spotted owl. Economic costs are created when the losses of income and employment are not temporary. Historically, a number of small communities in the region have received substantial employment and income generated by timber industries. Reducing a community's reliance on timber as a commodity to one based on other economic activity may negatively impact some communities.

From the agencies' responses, two levels of employment impacts were estimated: (1) Job losses attributable to implementing the proposed Recovery Plan, and (2) job losses attributable to the proposed critical habitat designation following the enactment of the proposed Recovery Plan. If the proposed Recovery Plan is not implemented the impacts from critical habitat designation as proposed would be the combined impacts of Alternatives 2 and 3. Once again, these estimates are based on an assumption that critical habitat designation has effects over and above those of implementing a recovery plan. Under current consultation policies, this assumption causes an overestimate of the impacts of designation. Short-term regional economic consequences are presented in Table 3.

Employment

Curtailing timber harvest due to the proposed designation of critical habitat will result in job losses in the short run, primarily in the timber industry. In addition to those jobs ''directly'' affected by reduced timber harvest, others will lose employment ''indirectly'' due to the reduced spending by employees and firms in the Solid Wood and Paper sector. To gauge the proportional impact, direct employment losses should be compared to employment in the Solid Wood and Paper sector, while total impacts (direct plus indirect) should be compared to employment in all sectors (Table 3).

The economy of the region would lose 366 jobs (0.08 percent of total regional employment) from implementation of the draft Recovery Plan. Of these, 271 jobs are direct employment in the Solid Wood and Paper sector (5.7 percent of 1991 employment in wood industries) and 94 are jobs in other sectors. Reduced Tribal timber harvest would account for the loss of 156 jobs of the 271 jobs lost in the Solid Wood and Paper sector (58 percent of direct employment losses), and 26 of 94 jobs lost in other sectors (28 percent of indirect employment losses).

The economy of the region would lose 147 jobs (0.03 percent of total regional employment), if the proposed critical habitat designation follows implementation of the proposed Recovery Plan. Of these, 120 jobs are direct employment in the Solid Wood and Paper sector (2.5 percent of 1991 employment in wood industries), and 27 are jobs in other sectors. Reduced Tribal timber harvest would account for the loss of 95 of 120 jobs lost in the Solid Wood and Paper sector (80 percent of direct employment losses), and 12 of 27 jobs lost in other sectors (44 percent of indirect employment losses).

The economy of the region would lose 513 jobs (0.11 percent of total regional employment), if critical habitat is designated without the proposed Recovery Plan having been implemented. Of these, 391 jobs are direct employment in the Solid Wood and Paper sector (8.1 percent of 1991 employment in wood industries), and 121 are jobs in other sectors. Reduced Tribal timber harvest would account for the loss of 250 of 391 jobs in the Solid Wood and Paper sector (64 percent of direct employment losses), and 37 of 121 jobs lost in other sectors (30 percent of indirect employment losses).

Household Income

The household income of some residents in the region will decline in the short run due to the proposed action. The households at greatest risk of income loss are those of employees of the timber industries. As timber industries reduce spending, the employment and income levels of other nontimber firms will also be negatively affected. Household income totaled $13.9 billion for the region in 1991 (Table 3).

TABLE 3.—REGION-WIDE SHORT-TERM EMPLOYMENT LOSSES AND REDUCTIONS IN HOUSEHOLD INCOME AND SALES REVENUES FROM MANAGEMENT ALTERNATIVES

	Baseline level	Enaction of the proposed recovery plan	Critical habitat after enaction of the proposed recovery plan	Critical habitat without enaction of the proposed recovery plan
Employment (in full- and part-time jobs):				
All sectors	451,050	(366)	(147)	(513)
Solid wood and paper sectors	4,770	(271)	(120)	(391)
Household Income (in $ million):				
All sectors	13,939	(4.7)	(1.3)	(6.0)
Solid wood and paper sectors	108	(3.3)	(0.9)	(4.2)
Sales revenues (in $ million):				
All sectors	27,189	(20.7)	(5.9)	(26.5)
Solid wood and paper sectors	516	(15.9)	(4.5)	(20.4)

The economy of the region would lose $4.7 million in household income (0.03 percent of total regional household income) from implementation of the proposed Recovery Plan. Of this amount, $3.3 million would be lost from the Solid Wood and Paper sector (3.0 percent of regional household income from the sector), and $1.4 million from other sectors. The loss of household income due to reduced Tribal timber harvest would total $1.4 million (30 percent of tribal household income lost).

The economy of the region would lose $1.3 million household income (0.01 percent of total regional household income), if the proposed critical habitat designation follows implementation of the proposed Recovery Plan. Losses from the Solid Wood and Paper sectors would total $0.9 million (0.8 percent of sector total), and $0.4 million from other sectors. Reduced Tribal timber harvest would account for the loss of $0.7 million (50 percent of tribal household income lost).

The economy of the region would lose $6.0 million household income (0.04 percent of total regional household income) from designating critical habitat if the proposed Recovery Plan has not been implemented. Of this amount, $4.2 million (3.8 percent of sector total household income) would be from the Solid Wood and Paper sector, and $1.8 million from nonwood industries. The household income lost from reduced Tribal timber harvest would total $2.0 million in (33 percent of tribal household income lost).

Sales Revenues

As timber harvests are curtailed throughout the region, business activity dependent on timber industries will slacken in the short run as well. Local governments' tax receipts may fall accordingly in the short-term. Total gross sales in the region totaled $27,189 million in 1991 (excepting the Trade sector, which reports value added), including gross sales revenues in the Solid Wood and Paper sector totaling $516 million (Table 3).

Gross sales revenues in the region economy would fall $20.7 million (0.08 percent of total regional sales revenues) from implementation of the proposed Recovery Plan. Of this, $15.9 million revenues would be lost from the Solid Wood and Paper sector (3.1 percent of 1991 sales by wood industries), and $4.8 million would be lost from other sectors.

Gross sales revenues in the economy of the region would fall $5.9 million (0.02 percent of total regional sales revenues), if the proposed critical habitat designation follows implementation of the proposed Recovery Plan. Of this, $4.5 million revenues would be lost from wood industries (0.9 percent of 1991 sales revenues by the Solid Wood and Paper sector), and $1.4 million of the reduction would be borne by nonwood sectors.

The economy of the region would experience a loss of $26.5 million of gross sales revenues (0.10 percent of total regional gross sales) if critical habitat is designated without enacting the proposed Recovery Plan. Of this amount, gross sales in the Solid Wood and Paper sector would fall by $20.4 million (3.9 percent of 1991 sales revenues in wood industries), and $6.1 million would be lost from other sectors.

Impacts to Local Communities and Counties

The proposed action could affect smaller communities and counties whose economies are closely tied to timber harvests. Most of the impacts that will occur from efforts to protect the owl probably have occurred already, brought about by listing of the owl and other species and by other management changes within the Forest Service. Nonetheless, the proposed critical habitat designation can further impact these counties by reducing taxable sales revenues and curtailing payments from Federal agencies.

Forest Service payments to counties may be reduced by the proposed critical habitat designation. The Forest Service pays 25 percent of its timber and other receipts to counties for support of county roads and schools. Most of the receipts in the region are from timber harvest. Forest Service receipts from timber harvest totaled about $32 million in 1989 and dropped to $22 million in 1993. Counties' shares totaled about $8 million in 1989 and about $5.4 million in 1993.

However, the actual impact to communities from reductions in Forest Service payments may be less than it seems at first. For most communities, reductions in payments from the Forest Service are offset by increases in other payments. Counties receive funds from the Federal government through payments in lieu of taxes (PILT). Among the factors that determine the amount of PILT paid to counties is Forest Service receipts. As Forest Service receipts decline, PILT payments increase. The impact on most counties is small, although a few counties in the region receive a substantial share of funds from the Forest Service and decreased timber receipts may not be offset entirely by higher PILT payments.

Catron County is one of the counties that receive a substantial share of Forest Service payments. In 1993, Catron County received $209,000 in county road and school funds from the Forest Service, an amount which would not be fully compensated for by PILT if it is lost. While it is unlikely that all of the Forest Service payments would be

eliminated, this amount is at risk in Catron County. Coconino County also is at risk from reduced timber harvests. The county received about $2.5 million in 1993 from Forest Service timber sales receipts. As with Catron County, a portion of these payments is at risk of not being replaced with PILT increases.

Nonmarket Benefits and Costs

Society stands to realize benefits and costs from the proposed designation of critical habitat for the owl. Economic benefits and costs are created when the effects of designation are not temporary, or do not adjust after the economy's transition. Benefits may include sustained biodiversity of the region, heightened intrinsic benefits from ensuring future environmental quality, and increases in the value of recreation opportunities. According to the Forest Service, ''Areas managed for Mexican spotted owl and northern goshawk habitat will have beneficial effects on the soil, water, and air resources due to restrictions on ground-disturbing activities.'' Costs may include increased expenses related to fire danger from limitations on some timber harvest activities, reduction of income to some sectors of the economy, and impact on tax receipts.

Arguments persist as to the economic sustainability of Federal timber programs in Arizona and New Mexico: critics point to Forest Service reports that show timber harvests in the region are conducted below cost, and claim harvest reductions will reduce losses to the U.S. Treasury. Supporters counter that Federal timber programs sustain the economies of rural communities and reduce the risk of stand replacing forest fires. An independent evaluation was not conducted for this analysis.

The nonmarket benefits accruing to society from species preservation are sometimes costly to quantify. Costs, in contrast, are more easily estimable and attract notice because effects often are market-based and localized. To properly compare benefits and costs, the full range of each must be considered. Benefits such as preserving species and increased environmental quality accrue to a large regional or national constituency. Costs follow an opposite trend; they are most significant locally but diminish rapidly as the focus becomes more national in scale. Data are not available at this time to estimate specifically the nonmarket costs and benefits of the designation.

One nonmarket benefit of the proposed action is the complementary impact on other listed and candidate species. The New Mexico Ecological Services State Office of the Service has described the benefits related to biological diversity that may result from the proposed critical habitat designation for the owl. The description is provided in the complete Economic Analysis.

Valuing Species and Their Habitat

Nonmarket economic benefits stemming from ecological preservation have not been quantified for the proposed action. However, other research has estimated benefits gained from preserving rare or endangered species and their habitat.

Estimates of species and habitat values, usually stated in terms of ''willingness to pay per household,'' range from $5.55/year per household (1984 dollars) for preserving habitat of the striped shiner to $86.32/year per household (1991 dollars) to preserve northern spotted owls and their old-growth habitat in the Pacific Northwest. These figures could be extrapolated from their sample sizes to a range of between $12 million per year for the striped shiner to residents of Wisconsin, and $8.287 billion per year for the northern spotted owl to households nationwide. Residents might be expected to be willing to pay within this range to preserve the Mexican spotted owl and its habitat.

Other empirical research offers evidence of nonmarket benefits of preserving components of ecological systems, including preventing forests from being developed, preserving air quality in parklands in the American Southwest, protecting spotted owls and old-growth forests in the Pacific Northwest, preserving river basins and preserving open space and ranchland from urbanization. These studies provide insights about public values for the presence (existence value), availability for future use (option value), and ability to preserve the resource for future generations (bequest value).

Nonconsumptive and recreation uses of the owl, such as viewing and photography, may be limited due to its nocturnal nature. However, protection of the owl's habitat may provide for recreation uses in the region, including increased enjoyment of a nonlogged environment and enhanced hiking and camping, photography, bird watching, and similar nonconsumptive uses.

Fishing, picnicking, horseback riding, and backpacking are examples of outdoor recreation that may be enjoyed in the range of the owl. These activities are not always sold in identifiable markets and thus their value must be quantified indirectly. Increased economic value from recreation can be observed from their contributions to sales and employment in sectors that provide outdoor recreationists with goods and services. In addition, ''net value'' to the consumer measures additional economic value after all costs to the consumer are subtracted. One survey-based study has estimated values on these types of outdoor recreation at between $17 and $49 per person per day (Walsh et al. 1990). These studies conclude that millions of dollars of net benefits are created annually for participants in these recreational activities.

The increased threat of fire is a potential cost of designation. Curtailing timber harvest within CHUs may cause an increase in tree density and fuel loads within the forest. This can increase fire danger, decreasing the value of the forests and increasing the threat to those living or recreating in or near forests. This threat may be mitigated in part through removal of the timber creating the danger.

According to the Forest Service (USDA 1994) fire suppression has allowed buildup of natural fuels, increasing the probability of fire spread and intensity. The Forest Service states that fire potential is affected by management activities—changing the age, distribution, density, and species selection can impact how fire affects the forest and habitat for the owl. The Forest Service supports proactive management practices such as prescribed fire and thinning treatments. A major obstacle preventing thinning may be the cost, as thinning has been supported by receipts from timber harvest.

The Service expressed concern for fire and other forest health issues when the owl was listed, and acknowledged that fire suppression has resulted in large tracts of small trees at high densities that are now susceptible to wildfires. The Service supports thinning and prescribed fire used to control the increased fire danger. The increased threat of fire danger is a factor related to forest management practices of the past, including fire suppression and timber harvest regimes in the region. The analysis does not assess specifically the economic consequences of increased fire threat.

The total value of social benefits of species preservation has been shown to be substantial in a variety of studies. The value of these benefits is expected to continue to rise over time as the number of households, relative to species and natural areas, increases. Given the information at hand, and without better understanding the network of consequences from management alternatives, it is not possible to disaggregate the sum of

benefits to identify that portion directly attributable to the designation.

Exclusion Process and Indian Lands

The maintenance of stable, self-sustaining, and well-distributed populations of Mexican spotted owls throughout their range is dependent upon habitat quality and its ability to support clusters of successfully reproducing owls that are sufficiently integrated to avoid or reduce demographic and/or genetic problems through time. Native American lands upon which units of critical habitat were designated were considered in a hierarchial fashion, first in terms of the quality of habitat and size of the cluster of owl territories, then for their relationship to surrounding units, and ultimately for their contribution to groups of units in larger, regional populations.

Native American lands occur in four general areas within the range of the Mexican spotted owl: the Four Corners Area where the states of Arizona, New Mexico, Utah, and Colorado meet; the Mogollon Rim Area extending in an arc across Arizona and New Mexico; the Western Basin and Range encompassing a small portion of southwestern New Mexico and the majority of southern Arizona; and the Eastern Basin and Range of central and eastern New Mexico.

The majority of the Four Corners Area is dominated by Great Basin desert scrub, grassland and woodland at lower elevations, and Petran montane conifer forests at higher elevations. Riparian vegetation is primarily confined to a relatively narrow band along water courses and is most apparent along major streams. Owl habitat is found in both montane forests and minimally or non-forested canyon habitats.

Navajo Nation

The habitat of the Mexican spotted owl on lands of the Navajo Reservation lie within the Chuska and Carrizo mountains. This region has had very limited survey work, and current records are restricted to 9 locales. The region may be an important demographic link between the subpopulations of owls to the east and southeast, and those owl clusters in the Colorado Plateau further to the northwest.

Due to rugged terrain, habitat in much of the forested and non-forested canyon habitat is expected to be in good condition. The more accessible forested areas on the mesas, the above-canyon flats, and foothills have had considerable overstory removal and are primarily second-growth, particularly on the Defiance Plateau. Even-aged silvicultural management across large management units has resulted in fairly extensive modifications of habitat (typically to those areas most likely to be utilized as foraging habitat).

Continued adverse modification of forest habitat is the greatest threat to habitat occupancy. Thorough application of even-age silviculture to large management units may result in extensive areas lacking minimal amounts of habitat able to sustain occupancy. Demographic persistence and connectivity between the smaller CHUs in the area may be hindered by the compounding factors of naturally disjunct habitat, the potential decrease in immigrants from larger neighboring clusters (AZ–NAIR–1), and the (primarily foraging) forest habitat being converted to young/mid-age and even-age/even-structure condition. The risk of catastrophic habitat loss due to fire at the lower and middle elevations is moderately high.

Critical Habitat Units

AZ–NAIR–1, AZ–NAIR–2, AZ–NAIR–3, AZ–NAIR–4, and AZ–NAIR–5

The CHUs comprise a chain of forested montane and canyon habitats in the Chuska Mountains and the adjacent Carrizo Mountains to the north; additionally units are located at the upper reaches of the Canyon de Chelly drainage system, and the Defiance Plateau.

Voluntary Tribal Conservation Measures

The Service is currently working with the Navajo Nation in the development of a Habitat Conservation Plan and the tribe and BIA are currently working on a 10-year management plan. However, these efforts have not yet culminated in planning documents. Although the Navajo Nation has not provided information concerning management and/or conservation of the Mexican spotted owl on the Reservation, the service understands that no timber harvesting will take place until those documents and the associated NEPA processes are completed, which is estimated to occur in June or July 1996.

Jicarilla Apache Indian Tribe

The Jicarilla Apache Indian Tribe and the Southern Ute Indian Tribe are also located in the Four Corners Area, in close proximity to the Santa Fe National Forest, Carson National Forest, and San Juan National Forest.

The region spans a large area at the interface of the Colorado Plateau and the Southern Rocky Mountains. Habitat ranges from heavily forested canyons and mesas, to rocky canyons with thin conifer/riparian stringers. Many of the territories have a high component of pinyon-juniper woodland in the more xeric areas. Rocky exposures may be an important component of owl habitat even at the close proximity to and influence of Southern Rocky Mountains. Habitat conditions vary between landownership. The habitats in the Southern Ute and the Jicarilla Apache Indian Reservations are managed with selective logging methods in the ponderosa pine stands, and minimal use is made of the mixed conifers that typically occurs on steep slopes. The CHUs on the San Juan and Santa Fe National Forests exhibit even-age/size and minimal mature overstory structure in most of the accessible, lower elevation forest stands. CHUs on the Carson National Forest are not exploited for timber, but are heavily roaded and have a high density of oil and gas well pads in many areas.

The region supports a long string of habitat and CHUs, it is directly connected by mostly forest and woodland habitat to the Jemez Mountains (Santa Fe National Forest) to the south, and less directly connected by woodland and grassland to Bureau of Land Management lands in Utah and Colorado.

Continued adverse modification of forest habitat and high levels of oil and gas development are the greatest localized threats to sustaining or recovering the subpopulation in the region. Demographic recovery and connectivity within the region and between this region and other critical habitat may be hindered by the compounding factors of naturally disjunct habitat, long dispersal distances, and much of the inter-CHU forest habitat being in generally young/mid-age and even-age/even-structure condition. The risk of catastrophic habitat loss due to fire is moderately high at lower and middle elevations.

Critical Habitat Units

NM–JAIR–1, NM–JAIR–2, NM–JAIR–3, NM–JAIR–4, and NM–JAIR–5

The five CHUs within the Jicarilla Apache Indian Reservation run north-south along a series of canyon incised mesas, and lie between the CHUs in the Santa Fe National Forest to the south and the Colorado-New Mexico State line. A parallel north-south series of CHUs in the Jicarilla Ranger District of the Carson National Forest lie 5 to 18 kilometers to the west. The majority of the high-potential breeding habitat (steep slope, mixed conifer) receives little or no timber management, and the

surrounding foraging habitat is managed primarily under uneven-age silviculture. The habitat within the Jicarilla Apache Indian Reservation has had limited survey to date. There are no known owls; however, two historical records exist for the Reservation, and territories and records exist for habitat to the north in Colorado, in the nearby Jicarilla Ranger District of the Carson National Forest, and on the adjacent Archuleta Mesa in NM–BLM–5. NM–JAIR–1 is contiguous to CO–SUIR–3.

Voluntary Tribal Conservation Measures

Informal discussions between the Service and the Jicarilla Game and Fish Department on owl-related issues were initiated during the data collection period for critical habitat development in early summer 1993. Continued discussions led to a mutual recognition of the significant differences between resource management and habitat conditions on federally administered lands and Jicarilla Reservation lands. These differences afforded an opportunity to address the threats identified in the listing proposal through the development of a tribal management plan for the owl. Working independently, the Jicarilla Game and Fish Department developed a draft ''Conservation Plan for the Mexican Spotted Owl on the Jicarilla Apache Reservation, New Mexico'' and requested review of the document by the Service at a meeting on November 21, 1994. Reviews were conducted and recommendations provided by the Service at that meeting and during subsequent telephone conversations with representatives of the Tribe. On December 16, 1994, the Jicarilla Apache Tribal Council approved the plan and formally submitted it to the Service.

The plan fully incorporates the Service's recommendations for management of critical habitat. These recommendations were adopted, in part, from the recommended guidelines outlined in the Draft Recovery Plan prepared by the Mexican Spotted Owl Recovery Team. In addition, the Jicarilla plan has increased protection in ponderosa pine foraging habitat above those levels identified in the Draft Recovery Plan.

Based on the removal of identified threats to the Mexican spotted owl and on the commitment of the Jicarilla Apache Tribe to enforce the Conservation Plan, the Service has proposed that the lands of the Jicarilla Reservation (101,923 acres within 5 critical habitat units) be deleted from further consideration for designation.

Southern Ute Indian Tribe

CO–SUIR–1, CO–SUIR–2, and CO–SUIR–3

The CHUs comprise a series of mesas with incised canyons. The habitat ranges from minimally forested canyon stringers to heavily forested slopes and mesa-tops. CO–SUIR–1 is contiguous and complementary to habitat in CO–SJNF–1; CO–SUIR–2 is contiguous and complementary to CO–SJNF–2; and CO–SUIR–3 is contiguous and complementary to NM–JAIR–1 and CO–BLM–4. The areas encompassed by the CHUs have not been surveyed, and no owls are known on the Reservation; however, a current record exists on BLM land (NM–BLM–5) across the Colorado-New Mexico State line in contiguous habitat.

Voluntary Tribal Conservation Measures

The Southern Ute Indian Tribe is engaged in continuing discussions with the Service. One of the goals of the discussions has been the development of a Memorandum of Understanding to facilitate cooperation between the Tribe and the Service. In a letter of April 28, 1995, on the proposal to designate critical habitat, the Southern Ute Tribe stated that, once a Memorandum of Understanding is in place, it is anticipated that cooperative efforts can be undertaken to develop mutually acceptable conservation plans for threatened and endangered species. At this time, no conservation plan for the Mexican spotted owl has been provided by the Tribe to the Service.

San Carlos Apache Indian Reservation

Owl habitat on the San Carlos Apache Reservation is located primarily in the Western Basin and Range province, and a portion of the Mogollon Rim area. The province is characterized by numerous mountain ranges that rise abruptly from broad plain-like valleys and basins. Within southern Arizona the mountain ranges are sometimes referred to as the ''Sky Islands'', and include the Mazatzal Mountains and the Natanes Plateau on the San Carlos Indian Reservation.

The isolated mountain ranges are vegetated by Madrean evergreen/oak woodland and chaparral, Madrean pine/oak forest, and mixed conifer forest; the mountains are surrounded by Sonoran and Chihuahuan desert-scrub.

Other CHUs of this region are administered by the Prescott, Tonto, Apache-Sitgreaves, and Coronado National Forests. The Army administers the lands within Fort Huachuca in the Huachuca Mountains. Although not included within critical habitat units, the Saguaro and the Chiricahua National Monuments also harbor some owl habitat.

Forested owl habitat on the San Carlos Apache Indian Reservation is predominately inaccessible and is in mostly suitable condition. Demographic persistence and connectivity may be hindered by the compounding factors of naturally disjunct habitat and the potential decrease in immigrants from larger neighboring clusters. The risk of catastrophic habitat loss due to wildfire is moderately high throughout the region.

Critical Habitat Units

AZ–SCIR–1, AZ–SCIR–2, and AZ–SCIR–3

The CHUs include fairly rugged forested and canyon habitats. Portions are contiguous with and complementary to habitat in AZ–FAIR–1 and AZ–ASNF–2. The habitat is mostly timber-unsuitable and in suitable habitat condition.

Voluntary Tribal Conservation Measures

Discussions between the Service and the San Carlos Apache Tribe are ongoing but have not yet resulted in the formulation of a conservation plan. Although there is good forested habitat on the reservation, much is inaccessible to timber harvest.

Mescalero Apache Indian Tribe

The Mescalero Indian Reservation encompasses a portion of the Sacramento Mountains, within the Eastern Basin and Range province that includes much of central and eastern New Mexico. The area is characterized by broad, flat basins and relatively isolated mountain ranges. The province includes the Manzano, San Andres, Sacramento, and Guadalupe mountains. The vegetation in the majority of this province is Chihuahuan desert scrub and Great Basin grasslands, with Great Basin woodland and Petran montane conifer forest at higher elevations. The Mescalero Indian Reservation borders sections of the Lincoln National Forest and includes a large area of critical habitat.

Forest habitat within the majority of the Sacramento Mountains had been railroad logged in the early part of the century. The high site productivity of the montane forests allowed for rapid regeneration of much of the owl habitat within 70 to 90 years. Currently, the majority of habitat is in suitable breeding and foraging condition. Habitat on the Mescalero Apache Indian Reservation is managed primarily under an uneven-age (selective) silviculture system. In general, most habitat on the

Reservation appears in suitable breeding habitat condition. In some areas, however, the widely applied uneven-age harvest methods appear to have resulted in homogenous stand conditions across the forested landscape. Large areas appear ''thinned'' and show little structural variance between stands. Stands may retain adequate structure and remain suitable for foraging, and be able to return rapidly to a suitable nesting condition, but at any one time, the lack of any significant amount of suitable nesting habitat may result in large areas subject to intermittent owl occupancy and unable to support breeding pairs.

The Sacramento Mountains support one of the largest owl clusters in the Southwest. Currently, there are 123 established territories on the Lincoln National Forest. There very limited available data on population size or owl occupancy for the Mescalero Apache Indian Reservation; however, the proximity of the Reservation lands to the Lincoln National Forest would lend support to the expectation of a significant number of territories (approximately 100) on the Reservation. Applying to this figure the average occupancy rates from the Lincoln National Forest gives an estimate of about 58 territories occupied by pairs, 21 territories occupied by single adults, and 21 unoccupied territories. This figure may be an overestimate, as occupancy rates are expected to be somewhat lower for the habitat patches at the northern end of the range (NM–LINF–1, NM–LINF–2, NM–LINF–3, and NM–LINF–4) due to disjunct habitat patches, small patch size, and relatively greater inter-habitat distances, and perhaps poorer habitat quality.

Continued adverse modification of forest habitat is the greatest threat to habitat occupancy. The area may also play an important role in source/sink dynamics with neighboring clusters. Diminished emigrant rates from the Sacramento Mountains may threaten the viability of the smaller, proximate clusters. The risk of catastrophic habitat loss due to fire at the lower and middle elevations is moderately high.

Critical Habitat Unit

NM–MAIR–1

The CHU is a large block of habitat comprising most of the northern half of the Sacramento Mountains. It is contiguous to NM–LINF–10 to the south, and NM–LINF–8, NM–LINF–6, and the White Mountain Wilderness to the north. There are no available data on owl occupancy; however, extrapolation of occupied habitat patterns to the north and south of the Reservation permits an estimate of about 100 territories for the CHU.

Voluntary Tribal Conservation Measures

The Service has met with representatives of the Tribe to discuss conservation planning for the Mexican spotted owl. The Mescalero Apache Tribe provided a rough draft (without biological or management details) of a conservation plan on May 3, 1995, for review by the Service. However, insufficient time remained in the comment period on the proposed designation of critical habitat to discuss Service recommendations for the document with the Mescalero Apache Tribe.

Delineation Criteria Applied to Indian Lands

Over and above the biological criteria used to delineate all areas, regardless of ownership, to be included in the proposal to designate critical habitat for the Mexican spotted owl, the Service also addressed the following considerations in determining to either retain or delete Native American lands in the final designation.

The restrictions are reasonable and necessary for the conservation of the Mexican spotted owl; and are the least restrictive available to achieve the conservation purpose.

The inclusion of Indian lands within critical habitat units was based solely on biology and the contribution of those lands to the conservation of the species. Where determined to be unnecessary, as with the removal of threats to the owl by the implementation of conservation plans by the White Mountain and Jicarilla Apache Tribes, the lands were either not proposed, or have been deleted from the final designation.

The interdependence of critical habitat and the recovery goals and management recommendations in the draft Mexican Spotted Owl Recovery Plan also present reasonable and necessary restrictions for the conservation of the species. The Mexican Spotted Owl Recovery Team has assembled and analyzed the best available data on the species, which were issued in the March 1995 publication of the Draft Recovery Plan. The goals are flexible and the guidelines for owl habitat management are considered the least restrictive for achieving recovery. The guidelines primarily limit management to protection of occupied sites and the highest quality nest/roost habitat. These are the minimum needed to ensure stable populations for the time necessary to assess population trends.

The restrictions do not discriminate against Indian activities.

The restrictions of critical habitat derive from the obligation, under the Endangered Species Act, of Federal agencies to ensure that their actions do not result in the destruction or adverse modification of critical habitat. The identified range-wide threat to the Mexican spotted owl is timber management relying on harvest methodologies that convert habitat that supports Mexican spotted owl to habitat that cannot. There is no prohibition of timber activities, nor of any other activity upon which the Indian Tribes might rely.

The Mexican Spotted Owl Recovery Team has a representative selected by the Tribal land management agencies. In addition, the Recovery Team frequently communicated with and solicited information from the Tribal land management agencies and governments. Tribal input was actively sought and received throughout the process.

The selection of Tribal lands for critical habitat was based on the biological significance of the contribution of those lands to the conservation of the Mexican spotted owl. The threats and the opportunities for recovery were considered on a range-wide basis and were not identified to discriminate or favor particular land owners.

The restrictions are necessary because current voluntary tribal conservation measures are not adequate to achieve the conservation purpose.

The proposed rule to designate critical habitat stated that ''If agreements can be reached (with the Tribes) and implementation ensured so that special protection is not necessary, the Service may consider excluding those areas from critical habitat.'' Conservation or management plans have been developed by the Jicarilla Apache and the White Mountain Apache tribes that meet these conservation objectives. Discussions are ongoing with several other tribes to develop conservation plans. However, at this time, implementation of those remaining plans under discussion is not ensured, and there are no final commitments that insure that owl populations and habitat will be managed to contribute to the survival and recovery of the species.

Consideration of Exclusions

Based on the analysis described above, the Service has considered whether the benefits of excluding any area proposed as critical habitat exceed the benefits of including it in the final designation. In particular, the areas proposed for potential exclusion in the

March 8, 1995, supplemental proposal have been considered for exclusion. At that time, lands of the Navajo Nation, and the Southern Ute, Mescalero Apache, and San Carlos Apache Tribes were proposed for exclusion under section 4(b)(2) of the Act contingent upon receipt and review by the Service of specific economic information pertinent to these lands and biological data concerning the presence, distribution, and habitat use of owls on these lands.

As described above, the data concerning the lands proposed for exclusion are presently inconclusive, and at this time do not provide an adequate basis upon which to exclude them from designation as critical habitat. Consequently, they have been retained within the critical habitat designated in this final rule. The Service will continue to provide technical assistance to the Tribes to develop an adequate database upon which to determine whether the benefits of their exclusion would exceed the benefits of including them in the designation.

The March 8 supplemental proposal also proposed to exclude lands of the Jicarilla Apache Tribe from final designation, not under section 4(b)(2) of the Act, but because that Tribe's Mexican Spotted Owl Conservation Plan, approved by the Jicarilla Apache Tribal Council, adequately addressed the conservation needs of the species and rendered these lands no longer in need of special management consideration or protection as specified in the Act's definition of critical habitat. The Service continues to consider the existing management of lands of the Jicarilla Apache Tribe to disqualify them from designation as critical habitat, and consequently critical habitat units NM–JAIR–1, NM–JAIR–2, NM–JAIR–3, NM–JAIR–4, and NM–JAIR–5 have been excluded from the final designation on these grounds.

The Service will continue to provide assistance to and cooperate with the other tribes on whose land critical habitat is being designated, with the goal of developing acceptable Mexican spotted owl conservation plans. When effective management regimes are developed for these lands as was done for those on the White Mountain Apache and Jicarilla Apache lands, the Service will propose revision of critical habitat to remove them from designation.

The final rule includes several revisions to the acreage indicated in the proposed rule. The change in the Forest Service acreage reflects a correction to an error in acreage accounting. The changes to BLM, Tribal, and private acres reflects a change in ownership for an area initially incorporated into critical habitat on the Jicarilla Apache Indian Reservation and subsequently removed from the final designation. The revisions are tabulated below in Table 4.

TABLE 4.—REVISIONS TO CRITICAL HABITAT ACREAGE BY LAND OWNERSHIP

	Proposed rule	Final rule	Revision
Forest Service	3,616,366	[a] 3,581,385	−34,981
Bureau of Land Management	11,424	11,377	−47
National Park Service	45,892	45,892	0
Department of Defense	2,013	2,013	0
State	9,820	9,820	0
Tribal	962,694	[b] 870,964	−91,730
Private	122,014	[b] 111,450	−10,564
Total	4,770,223	[a b] 4,632,901	−137,322

[a] Includes a correction to acreages cited in the proposed rule.
[b] Includes changes to ownership and deletion of Jicarilla Apache acreages cited in the proposed rule.

Available Conservation Measures

Recovery Planning

Recovery planning under Section 4(f) of the Act provides the guidance for the Act's activities and promotes a species' conservation and eventual delisting. Section 4(f)(1) requires the Secretary of Interior (usually delegated to the Director of the Service) to ''* * * develop and implement (recovery) plans for the conservation of endangered species and threatened species * * *'' Recovery plans may include population and habitat trend objectives, habitat management recommendations, and the steps necessary to remove a species from the List of Threatened and Endangered Wildlife and Plants.

The Service appointed the Mexican Spotted Owl Recovery Team (Team) in March 1993. Since that time, the Team has assembled all available data on Mexican spotted owl biology, the threats faced across the subspecies' range, current protection afforded the subspecies, and other pertinent information. Using that information, the Team developed the draft Mexican Spotted Owl Recovery Plan (Service 1995)(Plan or Recovery Plan) that outlines an initial short-term management strategy. If made final, the Plan will guide management until long-term guidelines are developed prior to delisting. The Plan recommends a short-term landscape management strategy to conserve the subspecies as population and habitat trends are assessed. Although a recovery plan is not a regulatory document, management recommendations outlined in the Plan are considered for application to critical habitat. The Forest Service Southwest Region has informally communicated its intent to incorporate the Plan's recommendations into all 11 national forests' Forest Land and Resource Management Plans (Forest Plans).

Section 7 Consultation

Section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to destroy or adversely modify critical habitat. Regulations found at 50 CFR 402.02 define destruction or adverse modification of critical habitat as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations that adversely modify any of those physical or biological features that were the basis for determining the habitat to be critical. This Federal responsibility accompanies, and is in addition to, the requirement in section 7(a)(2) of the Act that Federal agencies ensure their actions do not jeopardize the continued existence of any listed species. As required by 50 CFR 402.14, a Federal agency must consult with the Service if it determines an action may affect a listed species or critical habitat. Thus, the requirement to consider adverse modification of critical habitat is an incremental section 7 consideration above and beyond section

7 review to evaluate jeopardy and incidental take of the species. Regulations implementing this interagency cooperation provision of the Act are found at 50 CFR part 402.

The Act's definition of critical habitat indicates that its purpose is to contribute to a species' conservation, which by definition is the process of bringing a species to the point of recovery and removal from the lists of endangered an threatened species. Section 7 prohibitions against the destruction or adverse modification of critical habitat apply to actions that would impair survival and recovery of a listed species, thus providing a regulatory means of ensuring that Federal actions within critical habitat are considered in relation to the goals and recommendations of a recovery plan. As a result of the direct link between critical habitat and recovery, the prohibition against destruction or adverse modification of the critical habitat should provide for the protection of the critical habitat's ability to contribute fully to a species' recovery.

A number of Federal agencies or departments fund, authorize, or carry out actions that may affect lands the Service is designating as critical habitat. Among these agencies are the Forest Service, BIA, BLM, Department of Defense, Bureau of Mines, and Federal Highway Administration. The Service has identified numerous activities proposed within the range of the Mexican spotted owl that are currently the subject of formal or informal section 7 consultations.

Examples of Proposed Actions

Section 4(b)(8) of the Act requires, for any proposed or final regulation to designate critical habitat, a brief description of those activities (public or private) that may adversely modify such habitat or may be affected by such designation. Activities that would have no effect on the critical habitat's primary constituent elements would not adversely affect critical habitat. However, although an action may not adversely affect critical habitat, it may still affect individual spotted owls (e.g., through disturbance) and, therefore, be subject to consultation under the jeopardy standard of section 7 of the Act.

An activity cannot cause adverse modification of critical habitat in an area that does not contain or have the potential to contain the physical and biological features comprising the primary constituent elements. Due to the limitations in the fineness of the mapping data and the interspersed nature of suitable and unsuitable habitat types, some such areas are incidentally included in the designation.

Activities that disturb or remove the primary constituent elements within designated critical habitat units may adversely modify the owl's critical habitat. These activities may include actions that reduce the canopy closure of a forest stand, reduce the density or the average diameter of the trees in a stand, modify the multi-layered structure of a stand, reduce the availability of nesting structures and sites, reduce regeneration or modify the structure of riparian habitat, reduce the suitability of the landscape to provide adequate cover, or reduce the abundance or availability of prey species.

Areas designated as critical habitat for the spotted owl support a number of existing and proposed commercial and noncommercial activities. Some of the commercial activities that may affect spotted owl critical habitat include timber harvest, timber salvage, tree density control activities such as thinning, insect and disease suppression activities, snag removal, livestock grazing in riparian habitat, certain fire suppression activities such as fire break construction and use of chemical fire retardants. Additional actions include land disturbance activities such as those associated with oil and gas leases, sand and gravel extraction, mining, military maneuvers, road development, construction of hydroelectric facilities, geothermal development, and construction of campgrounds, ski areas and associated facilities. However, whether the above activities would be prohibited or require modification under section 7(a) of the Act would depend on their magnitude of effects.

Actions not likely to destroy or adversely modify critical habitat include livestock grazing in upland habitats, ''personal use'' commodity production such as fuelwood, latilla and viga, and Christmas tree cutting, and most recreational activities including hiking, camping, fishing, hunting, cross-country skiing, off-road vehicle use, and various activities associated with nature appreciation. The Service does not expect any restrictions to those activities as a result of critical habitat designation.

Some activities may be considered to be of benefit to Mexican spotted owl habitat and, therefore, would not be expected to adversely modify critical habitat. Examples of activities that could benefit critical habitat may include some protective measures such as fire suppression, prescribed burning, brush control, snag creation, and certain silvicultural activities such as thinning.

Consultation Process

Federal agencies are responsible for determining the effects of an action and whether or not to consult with the Service. When requested, the Service will review the action agency's determination on a case-by-case basis to determine concurrence on whether the action is or is not likely to adversely affect critical habitat. Section 7 consultation on critical habitat focuses on the effects of actions on owl habitat regardless of occupancy. The presence or absence of individual or pairs of spotted owls does not factor into the determination on whether an action does or does not initiate section 7 consultation on effects to critical habitat. The trigger initiating consultation on critical habitat is the action agency's determination that a project may affect any of the primary constituent elements of critical habitat or reduce the potential of critical habitat to develop these elements, and is independent from any action that would affect known individuals. Federal project assessments should also take into consideration actions outside critical habitat that may affect areas within critical habitat.

In section 7 evaluation of proposed activities within critical habitat, the Service uses project descriptions and biological assessments provided by the action agency. Proposed actions are individually examined in terms of site-specific impacts to the primary constituent elements and the reasons for which the critical habitat unit has been designated. In addition to assessment of individual proposed actions, the Service also considers the additive effects of past, on-going, and proposed actions. Proposed projects within critical habitat are also examined spatially to determine adverse effects to habitat across the surrounding landscape. The additive effects of actions in proximity to the proposed project may collectively result in the appreciable reduction of the value of a critical habitat unit. Conversely, an isolated proposed action within a large expanse of unmodified habitat may not adversely affect the function for which a critical habitat unit was designed.

The range of the owl is subdivided into a number of provincial areas discussed in the Recovery Unit (RU) section of the draft Recovery Plan (Service 1995), which constitute the demographic units by which recovery is to be measured. These geographic subdivisions are based partly on physiographic and biotic factors, and patterns of owl distribution. The provinces and local sub-populations of owls are for the most part interrelated

and interconnected. Provinces, subprovinces, and individual critical habitat units are all part of a habitat network important to maintaining a stable and well-distributed population over the range of the owl. The loss of one or more provinces, or even a major part of a province, could lead to genetic and demographic isolation of parts of the subspecies' range. Potential isolation could have a greater near-term effect on some areas (e.g., the Southern Rocky Mountains—New Mexico and Colorado RU) because of the present status of owl numbers and distribution within those areas, than on other areas (e.g., Upper Gila Mountain RU). Population stability for the owl may depend on the relative location of large stable population reserves that act as sources for areas where mortality exceeds recruitment, or where owls are subject to population fluctuation, or exhibit low reproductive success (Thomas *et al.* 1990; Service 1995).

For a wide-ranging subspecies such as the Mexican spotted owl, where multiple critical habitat units are designated, each unit has both a local, regional, and rangewide role in contributing to the conservation of the subspecies. The loss of a single unit may not jeopardize the continued existence of the subspecies, but may result in local demographic instability and declines in local population trends. This may affect dispersal and connectivity, and thus, have a detrimental effect on the stability of the regional population or at the least on that portion of the region's population where the loss occurred. This, in turn, may have an adverse effect on linkage to other provinces leading to further isolation and instability, and reduce the likelihood of survival of the subspecies. Section 7 analysis of proposed activities should assess the baseline condition and expected role of the unit at several scales to determine whether any particular action would appreciably diminish the value of a critical habitat unit for the survival and recovery of the owl. These scales should include the management area and immediate surroundings, and the individual critical habitat unit and collective units that constitute a recovery unit.

Reasonable and Prudent Alternatives and Conservation Recommendations

Where a proposed action is likely to result in the destruction or adverse modification of critical habitat, the Service is required to provide reasonable and prudent alternatives to the proposed action, if any, in its biological opinion. Reasonable and prudent alternatives are designed to allow the intended purpose of the proposed action to go forward, and to remove or mitigate the conditions that would adversely modify critical habitat. The Service recommends that an action agency initiate discussions early enough in the planning process to reduce the likelihood that an action may result in the destruction or adverse modification of critical habitat, and to ensure that the planning process is not to the point where the development of alternatives is infeasible. Reviewing widespread and long-term actions such as timber sale and forest health programs on a programmatic basis would facilitate this process.

For actions that result in adverse effects but do not result in the destruction or adverse modification of critical habitat, the Service may provide discretionary conservation recommendations to minimize or avoid the adverse effects of a proposed action. The Service may suggest minor modifications to a proposed action that results in moderate impacts to critical habitat. For projects that may result in more severe impacts, more substantial project changes may be recommended. For example, in the case of a timber sale, the Service may recommend that certain cutting units be reduced in size, reconfigured, relocated, or dropped altogether to avoid impacts to primary constituent elements. The Service may also recommend alternate timber harvest prescriptions, or that specific features such as a minimum of large diameter live trees be retained for snag recruitment.

Other Conservation Measures

To the maximum extent possible, state and private lands were excluded from the delineation and designation of critical habitat. If an action carried out by a non-Federal entity affects spotted owls, that action would be subject to the prohibitions under section 9 of the Act, that prohibit intentional and non-intentional ''take'' of listed species and applies regardless of whether or not the lands are within critical habitat. The term ''take'', as defined by the Act, means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

There may be some instances where activities on non-Federal lands may be subject to section 7 requirements. For example, a private party may require a right-of-way permit through critical habitat on Federal lands for an action on private lands. In this type of case a section 7 consultation may be required on the Federal land right-of-way permit because the action requires Federal involvement. The Service does not expect that there will be many of these types of situations and most may be handled through informal consultation. However, if a biological opinion is required, recommendations will be provided to help avoid impacts to critical habitat consistent with those examples identified in the previous section.

Frequently actions taken on Indian lands are authorized, funded or carried out by a federal agency. In those circumstances, that federal agency, which is frequently the Bureau of Indian Affairs, is required to consult under section 7 to insure that the action does not jeopardize a protected species or adversely modify or destroy critical habitat. However, a number of Tribes (and federal agencies as well) have begun working with the Service early in their resource management planning stage to insure that the plan builds in protections for listed and candidate species and their protected habitat. Although section 7 consultations may still be necessary, sound resource development/conservation plans minimize the need for additional mitigation measures.

Section 7 and section 10(a)(1)(B) authorize the Service to permit the taking of listed species incidental to otherwise lawful activities such as timber harvesting. Biological opinions completed as part of formal section 7 consultation may authorize a set amount of incidental take associated with Federal activities. For non-Federal actions, incidental take permit applications must be supported by a Habitat Conservation Plan (HCP) that identifies conservation measures that the permittee agrees to implement to conserve the species, usually on the permittee's lands. A key element of the Service's review of an HCP is a determination of the plan's effect upon the long-term conservation of the species. An HCP would be approved and a section 10(a) permit issued if it would minimize and mitigate the impacts of the taking and would not appreciably reduce the likelihood of the survival and recovery of that species in the wild.

The Service expects limited Federal involvement for projects on state lands and, therefore, few formal section 7 consultations on state lands that are included in designated critical habitat. For those areas of private land within critical habitat, section 7 would apply only for actions that are funded, authorized, or carried out by a Federal agency. The states and private individuals are still subject to the ''take'' prohibitions under section 9 of the Act,

however, and may enter into the section 10 HCP process where appropriate.

Other Federal laws, such as the National Forest Management Act, the Federal Land and Policy Management Act, the National Environmental Policy Act, and various other state and Federal laws and regulations, also require the conservation of endangered and threatened species.

Summary of Comments

The final rule listing the Mexican spotted owl as threatened was published in the **Federal Register** on March 16, 1993 and announcements of the listing and availability of the final rule were mailed to Federal, Tribal, state, county, and local agencies and governments, and all interested parties on the Service mailing list. The rule announced that the Service had concluded that designation of critical habitat was prudent, but found that critical habitat was not presently determinable, and was initiating the gathering of information and the studies needed to ascertain critical habitat areas. Based on the information received, the Service issued the proposal rule to designate critical habitat on December 7, 1994. The proposed rule was sent to affected Federal, Tribal, state, county, and local agencies and governments, and notices of the availability of the rule was sent to all interested parties on the Service's mailing list. Public notices of the proposal for publication as legal notices were also sent to 18 newspapers throughout the four-state region on December 5, 1994. The general mailing and newspaper notices requested data and comments from the government and public on all aspects of the proposal, including data on the economic impacts of the designation. The notice also announced a 90-day comment period open until March 7, 1995. On December 19, 1994, the Service sent a request for information on the potential economic impacts of designating critical habitat to 13 Federal, 12 Tribal, and 10 state agencies, and 4 Governor's and 42 county government offices. A Draft Economic Analysis (DEA) was prepared based on the information received and a notice of the availability of that draft was published in the **Federal Register** on March 8, 1995 (60 FR 12728; 60 FR 12730). The publication also proposed several revisions to the original proposal, solicited additional information and comments, opened an additional 60-day comment period extending to May 8, 1995, and announced the schedule and location of public hearings. More than 700 parties on the Service's mailing list also received an announcement of the above subjects. On February 23, 1995, the Service also sent for publication as legal notices in 36 regional newspapers, an announcement of the availability of the DEA, solicitation for additional information and comments, the opening of the additional comment period, and the schedule and location of public hearings.

Because of anticipated widespread public interest, the Service held 4 public hearings. Approximately 532 people attended the hearings. About 23 people attended the hearing in Santa Fe, New Mexico; 138 in Socorro, New Mexico; 46 in Tucson, Arizona; and 325 in Flagstaff, Arizona. Transcripts of these hearings are available for inspection by appointment (see **ADDRESSES**).

A total of 844 written comments were received at the Service's Ecological Services State Office in Albuquerque, New Mexico: 25 supported the proposed listing; 249 opposed the proposed listing; 9 either commented on information in the proposed rule but expressed neither support nor opposition, provided additional information only, or were non-substantive or irrelevant to the proposed listing; and 561 form letters expressed opposition to the designation. Oral or written comments were received from 158 parties at the hearings: 10 supported the proposed listing, 146 opposed the proposed listing, and 2 expressed neither support nor opposition.

In total, oral or written comments were received from 29 Federal, Tribal, and state agencies and offices; 31 local government offices; and 172 private organizations, universities, companies, and individuals. All comments, both oral and written, received during the comment period are addressed in the following summary. Comments of a similar nature are grouped into a number of general issues. These issues and the Service's response to each, are discussed below. Issues that were addressed in the final rule to list and the petition findings to remove the owl from the list of threatened species have not been reiterated and may be found in those **Federal Register** publications.

General Issues

Issue 1: The Service has characterized owl nesting and roosting habitat as having a high incidence of large trees with various deformities but has not quantified these attributes. In addition, the term old-growth is not properly used or defined when describing owl habitat and does not correspond to the definition used by the Forest Service. These inaccuracies preclude the inclusion of this habitat in critical habitat.

Service Response: The owl uses a variety of forest types, including deciduous riparian woodlands, pinyon-juniper, pine-oak, mixed conifer, and spruce-fir. The features and proportion of habitat serving the various life history needs of the owl also vary throughout the range of the subspecies and upon vegetation type. However, forested habitat used for nesting and roosting often contains mature or old-growth stands with complex structure (Skaggs and Raitt 1988; Ganey and Balda 1989a, 1989b; Kroel and Zwank 1991; Service 1995 and other references therein). The characteristics typically include a significant component of mature trees, high basal area, high canopy closure, multi-storied forest structure, and abundant dead and down woody material.

The commenter is correct in noting that old-growth definitions are often not quantified when used and may vary among both agencies and individuals using the term. However, the Service's use of the term has been limited to noting the incidence of specific attributes in mature and old-growth habitat, and summarizing the conclusions reached by studies that may use the term. Quantification of these attributes is not necessary for qualitative or summary descriptions of owl habitat, and detailed definitions and methodology may be found in the original literature source. Features such as large diameter trees, multi-layered canopy, and snags, may be found in any of numerous definitions of mature and old-growth conditions. Furthermore, the identification of owl habitat areas considered for inclusion in critical habitat did not depend on the identification of old-growth. Identification of habitat was based primarily on the owl habitat information provided by land-managing agencies to the Service.

Issue 2: Some commenters stated that pure ponderosa pine vegetative types are not suitable habitat for nesting and roosting, and should therefore not be included within critical habitat. Others believe that ponderosa pine is a habitat type used by the owl and should be included in critical habitat.

Service Response: Ponderosa pine is found in numerous vegetative associations. The Service does not consider ponderosa pine associations where other coniferous tree species such as Douglas fir and hardwoods such as Gambel oak are not found or exist as minor accidental occurrences to be habitat suitable for nesting and roosting. However, relatively pure ponderosa

pine associations may be used for foraging where they are found in proximity to other vegetative associations that do support nesting and roosting activity. Where ponderosa pine exists as a codominant with other tree species, the habitat may support the combined nesting, roosting, and foraging needs of territorial owls. The inclusion of ponderosa pine habitat types within critical habitat was determined by its presence in known owl territories and proximity to other nest/roost habitat. It also may occur as inclusions and intervening stretches between other habitat types. However, extensive areas of pure ponderosa pine were generally not included in critical habitat. Where these areas do occur and have no potential for use by foraging owls, they may be considered lacking primary constituent elements and be managed as unsuitable habitat.

Issue 3: The Service's premise that foraging areas may be determined by their proximity to areas serving as nest/roost habitat is unsubstantiated.

Service Response: Many of the habitat components that serve the nesting and roosting needs of individual owls are more restrictive and less widespread than those found in areas used solely for foraging activity, and are likely to be a limiting factor in determining owl presence and habitat use. In most cases, known territories determined the areas for inclusion in critical habitat. Where unsurveyed habitat or areas with low owl densities were considered, the Service identified areas of ''suitable'' or nest/roost habitat as essential ''nuclei'' for the delineation of habitat that may support the territorial needs of owls. Activity centers are areas within which owls find nest and roost sites, and in which a significant amount of foraging activity occurs (Gutiérrez *et al.* 1992; Service 1995). Owls appear to concentrate foraging activity within a relatively small portion of the home range, and this activity center is typically located around nest or roost sites. Foraging habitat can only be used by territorial owls if it lies within the effective radius of an owl home range. Therefore, it is reasonable to assume that, adjacent to habitat determined by land managing agencies to be suitable for nesting and roosting, may be areas available for foraging activity. Examination of territories delineated by land-managing agency biologists on the basis of detection locations supports this conclusion.

Issue 4: Owls may disperse in a wide variety of habitats. The inclusion in critical habitat of areas for facilitating dispersal is not justified.

Service Response: There is little information available on the dispersal behavior of the Mexican spotted owl. Consequently, it is not possible to describe any primary constituent elements or manage for the habitat attributes necessary to support this behavior. The Service did not select for inclusion in critical habitat any areas capable only of supporting dispersal movements. This type of habitat may be found only as inclusions and intervening stretches within larger areas identified with the potential to support owl territories.

Issue 5: The term ''capable habitat'' is not defined or supported by research, and should be excluded from critical habitat.

Service Response: The term ''capable'' is used in the proposed rule in the following context: ''* * * capable of returning to suitable condition * * *'' It is a term used by other land-managing agencies and in the geographic information provided to the Service. The Service acknowledges the qualitative nature of the term.

Issue 6: Total critical habitat acreage is greater than prior estimates of suitable owl habitat. Critical habitat contains much unsuitable habitat that should be excluded from the designation. Lands that are not occupied by the Mexican spotted owl and/or do not exhibit the physical and biological features essential to the owl should not be included in critical habitat. Potential habitat should not be included in critical habitat.

Service Response: Owl habitat includes a wide variety of vegetative and topographic features, and is fairly heterogeneous at both landscape and home-range scales. Habitat characterized by land-managing agencies as ''suitable'' is defined as areas able to support the combined nesting, roosting, and foraging needs of the subspecies. Suitable habitat occurs in a matrix of habitat suitable only for less restrictive behavioral needs such as foraging and dispersal, and may itself have inclusions and intervening stretches of unsuitable habitat. Based on previous land-managment agency estimates, there exists a wide range in the proportion of suitable habitat within owl home ranges. Frequently, the proportion of suitable to other habitat types may comprise half of a home range area. In canyon habitat characterized by minimal forest cover, the vegetative types classed as suitable may comprise a small fraction of the total area within a home range. Therefore, suitable and unsuitable habitat may occur in a combined area two to several times as large as the 2 to 4 million acres of suitable habitat cited by various agencies and Service estimates. Areas lacking or without the potential to regain primary constituent elements may be considered and managed as unsuitable habitat.

The use of the term ''potential'' in the proposed rule refers to the capability of a site that has undergone past habitat modification to return to a condition in which it may become owl habitat again. It does not refer specifically to any successional processes or management objectives to create owl habitat where none existed before. It also does not refer to uncertainty in whether an area actually serves as habitat.

Issue 7: The Service used data provided by the USFS Southern Forest Experiment Station (SFES) to determine the vegetation type of each proposed critical habitat unit. These data show that about 95% of the land included in critical habitat are not forest types the Service considers to be critical.

Service Response: The data compiled for the identification of areas to be included in critical habitat came from many disparate sources and land-managing agencies. None of the data used by the Service came directly from SFES, although some agencies may have derived some or all of their data from this source, and in turn have provided it to the Service. The ''95%'' figure cited from Table A3 of the Draft Economic Analysis does represent land cover summaries derived exclusively from SFES data. Further analysis of this data set showed that it used vegetative classifications that did not readily identify other vegetative associations and did not represent complete floristic compositions. Therefore, the ponderosa pine class in the SFES data set frequently includes other coniferous and hardwood tree species that under other classifications may be considered pine-oak or mixed conifer. Analysis of critical habitat using a more detailed data set provided a more accurate representation of vegetative associations within critical habitat. Table 5 below shows vegetative associations derived from U.S. Geological Survey land coverage (figures reflect revised acreages). As discussed previously, vegetative associations such as mixed conifer or pine-oak that support the combined nesting, roosting, and foraging needs (''suitable'') of the owl comprise only a portion of the total habitat utilized, and may occur within unsuitable habitat or habitat used only for foraging. Furthermore, within owl habitat there are inclusions of less frequently or non-utilized areas. These factors combine to limit the relative

proportion of critical habitat that comprises nest/roost habitat.

TABLE 5.—VEGETATION LAND COVER IN CRITICAL HABITAT BY STATE

Land cover	Arizona	Colorado	New Mexico	Utah	Total	Percent total
Agriculture	31,736	351	44,998	33,023	110,108	2.4
Alpine	.....	.....	285	.....	285	<0.1
Chaparral	82,508	.....	70,938	14,657	168,103	3.6
Grassland	4,461	.....	251	.....	4,712	0.1
Madrean Woodland	65,702	.....	64,465	.....	130,167	2.8
Mixed Conifer	505,688	67,255	1,103,408	53,759	1,730,110	37.3
Pine-Oak	81,352	494	29,931	1,589	113,366	2.4
Pinyon-Juniper	269,494	22,463	383,516	59,696	735,169	15.9
Ponderosa Pine	899,560	13,541	641,945	18,694	1,573,740	34.0
Shrub Steppe	50,862	.....	7,688	7,603	66,613	1.4
Water	247	.....	741	.....	988	<0.1
Total	1,991,610	104,104	2,348,166	189,021	4,632,901	100
Percent total	43.0	2.2	50.7	4.1	100	.....

Source: National Biological Service, Midcontinent Ecological Science Center.

Issue 8: The Service has not surveyed or determined that critical habitat possesses any or all of the components of suitable habitat. The macroanalysis of aerial photography and forest type maps is inadequate to distinguish the elements that the Service claims comprise suitable owl habitat.

Service Response: The Service relied primarily on map identification of owl habitat and occupancy provided by the land-managing agencies for the delineation of critical habitat. Additional information such as forest type maps and aerial photography was used to supplement owl habitat and site maps. Forest type maps may be compiled by land-managing agencies by use of information at a variety scales. Most scales are fine enough to locate specific areas to within a hundred feet. The Service used 1:24,000 scale aerial photography sufficiently detailed to pick out individual trees and identify vegetation types. Although nest/roost habitat comprises only a portion of the total critical habitat area at the home range scale and primary constituent elements are also only found in a subset of habitat at finer scales, all critical habitat areas have the capability of supporting territories at the landscape scale.

Issue 9: Regulations pertaining to the designation of critical habitat state that the entire geographic range that can be occupied by a species is not to be included in critical habitat. Unoccupied habitat may only be designated if determined to be essential to the conservation of the species.

Service Response: The Service has not designated the entire potential geographic range of the subspecies. However, critical habitat does include the entire subset of the known or expected owl population where there exist resource management actions with known or expected adverse habitat impacts. The Service believes that the current owl population is adequate to achieve delisting should the central subpopulations show stable or increasing demographic trends. Therefore, all known territories and supporting habitat are essential to the recovery and conservation of the subspecies.

Habitat may be unoccupied due to such disparate factors as demographic inviability and extirpation, or natural intermittency and movement between different habitat areas or alternate home ranges. Critical habitat includes some areas with low owl densities and intermittent occupancy. However, no critical habitat units were designated that are incapable of supporting spotted owls.

Issue 10: The Service cites the minimization of fragmentation as a guideline used in the delineation of critical habitat. Southwestern forests are naturally fragmented, and the guideline is not applicable to Mexican spotted owl habitat.

Service Response: The Service agrees that southwestern forests and owl habitat are characterized by heterogeneous and discontinuous vegetative cover types. The minimization of fragmentation, a principle emphasized by the Interagency Scientific Committee for the northern spotted owl (Thomas *et al.* 1990) and others working in the field of conservation biology, was only used in the delineation of critical habitat in the infrequent instances where there was some choice between areas of habitat fragmented because of management activities and other relatively unmodified areas. For the most part, delineation was determined by the presence of owl territories. Extensive tracts of unsuitable habitat were not included to increase the contiguity of critical habitat units.

Issue 11: The Service offers no evidence to support the statement in the proposed rule that National Park Service lands and wilderness areas are not sufficient to support a viable population of owls.

Service Response: The proposed rule states that ''* * * these lands by themselves do not provide adequate habitat to support a viable *range-wide* Mexican spotted owl population * * *'' (emphasis added). National Parks and wildernesses do not constitute a well-distributed land base nor contain a significant proportion of owl habitat. The largest of the wilderness areas supporting Mexican spotted owls are the Aldo Leopold and Gila Wildernesses. These fairly contiguous areas may support a relatively sizeable subpopulation of owls. However, the long-term viability of a population limited to the combined wilderness areas is low because of the local extent of available habitat and the susceptibility of relatively small populations to genetic, demographic and environmentally random events. The great distances between park and wilderness areas further reduce their ability to support viable populations without the complementary function of additional habitat outside the reserved areas. There is ample support for this

general observation in the available literature on the dynamics of small populations.

Issue 12: Exclusion of wilderness areas and National Parks from critical habitat is not justifiable.

Service Response: The Service considers management practices in place and threats to specific areas when determining which areas are in need of special management or protection and therefore meet the definition of critical habitat. The Service acknowledges that some resource extraction and human-caused habitat changes occur in both National Parks and wilderness areas. However, the threat of even-age timber management has been identified as a primary threat to owl habitat, and critical habitat was predominately identified in areas where that activity may occur. The Service is unaware of any plans for logging in wilderness areas or National Parks.

Issue 13: Successional changes in forest habitat types have resulted in forest health problems. Management of owl habitat will increase tree densities, canopy layers, and fuel loads, and in turn, increase the risk and intensity of wildfire. Critical habitat will also preclude the implementation of fire prevention activities.

Service Response: The Service agrees that many vegetative communities have undergone successional and structural changes as a result of past and current management practices. These practices include, to varying degrees, the combined effects of long-term and widespread fire suppression, reduction in surface fuels, rates of tree overstory removal and regeneration treatments on cycles shorter than those found in natural disturbance regimes, inadequate control of tree densities responding to fire suppression and tree harvest, and in xeric forest types, decreases in the proportion of the landscape in stands composed of more fire resistant large-diameter trees. The Service also agrees that the vegetative structural and landscape changes may require proactive management to restore an appropriate distribution of age classes, control regeneration densities, and reintroduce some measure of natural disturbance processes such as fire events. This may include prescribed fire and thinning treatments, restoration of the frequency and spatial extent of such disturbances as regeneration treatments, and implementation of prescribed natural fire management plans where feasible. The Service considers use of such treatments to be compatible with the ecosystem management of habitat mosaics and the best way to reduce the threats of catastrophic wildfire. The Service will fully support land management agencies in addressing the management of fire to protect and enhance natural resources under their stewardship.

Critical habitat objectives do not include the conversion of forest vegetative types, nor the prevention of actions designed to alleviate the risk of wildfire. Management approaches considered for critical habitat primarily focus on the maintenance of mature forest attributes in mixed conifer and pine-oak habitat types over a portion of the landscape and in areas that support existing territories. It does not emphasize the creation of these features where they do not currently exist. It also does not preclude the proactive treatments mentioned above. Clearly, the loss of owl habitat by catastrophic fire is counter to critical habitat management objectives.

It is important to stress several principles in the Service's policy on fire management. The first is that the Service always defers to the expertise and authority of the land-managing agency during response actions to fires. The second is that firefighter safety is of paramount importance and is never superseded by wildlife management objectives. The third is the Service has a responsibility to assist in the protection of life and property. The Service's primary role in dealing with the combined issues of both fire and critical habitat management is to assist in the development and implementation of management practices that incorporate the objectives discussed above without violating the aforementioned principles. These principles are set forth in an issue paper signed May 16, 1995, by the Regional Forester of the Southwest Region of the U.S. Forest Service and the Acting Regional Director of the U.S. Fish and Wildlife Service.

Issue 14: The range of the Mexican spotted owl has changed over the last 100 years. Pre-settlement forests were more open and dominated by ponderosa pine, and were therefore not owl habitat. Fire suppression allowed conversion of ponderosa pine forests to mixed conifer forests, allowing the spotted owl to occupy formerly unoccupied areas. Critical habitat should be limited to the historic distribution of mixed conifer forests.

Service Response: The Service agrees that some areas now occupied by spotted owls may not have been occupied in pre-settlement forests, which in certain vegetative associations were more open-canopied and composed of ponderosa pine rather than mixed conifer species. However, the Service is unaware of any way to estimate how many sites are ''recently'' occupied, nor can it determine where those sites are.

Conversely, the spotted owl was known to nest in the mature forests that dominated the lowland riparian areas in pre-settlement times but are now largely absent. Again, the Service is unable to quantify the number of nesting territories supported by that forest type. The result is that some formerly important areas have become unable to support owls, while other areas have only become owl nesting and roosting habitat recently. These phenomena undoubtedly offset one another but are not quantifiable. The Service recognizes that forest structure is the result of dynamic processes, but must base its decision on the current situation and the best available information.

Issue 15: According to the Forest Service, mixed conifer forest faces severe threats from insects and disease. This supports the position that before fire suppression these forests were less dense, and failure to treat this threat by timber harvest poses a significant threat to the owl.

Service Response: The Service acknowledges that this link may exist, especially in drier mixed conifer associations that under natural fire regimes experienced frequent low-intensity and spatially extensive understory fire events. These mixed conifer associations may have developed higher densities of small-diameter stems that have escaped the thinning effects of fire. In these situations, there may be some benefit from understory and small and mid-diameter tree density regulation. Designation of critical habitat does not preclude this type of management.

Issue 16: In the final rule to list the Mexican spotted owl as threatened, the Service stated that the national forest plans call for a conversion of habitat to an unsuitable condition at an annual rate of 0.4 percent. At that conversion rate it would take 250 years for suitable owl habitat to be completely destroyed. The Service stated in the listing rule that it takes 80 years for habitat recovery of a harvested area. This means that at least 60 percent of owl habitat will always remain, even at 1991 logging levels.

Service Response: The 0.4 percent conversion rate would represent a 250 year ''cycle'' assuming that the national forests operated on such a rotation length. However, most timber lands operate on cycles of 120 years or less, meaning that a stand would be ''regenerated'' as it begins to regain complex structural attributes.

Furthermore, stands that are managed under even-age systems become designated to continue under such a system, and will mostly remain as habitat incapable of supporting the more restrictive habitat needs of nesting and roosting owls. Continued conversion of habitat cumulatively adds to the habitat indefinitely retained in a modified condition.

The Service's statement in the listing rule that 80 years is required for habitat to recover was made in the context of forest habitat on the Lincoln National Forest where high site indices permit rapid recovery. Forest habitat in most other areas of the Southwest have lower indices and may be expected to require longer recovery periods. Fletcher (1990) estimated that 44 percent of habitat modified on national forests would require more than 100 years to recover. This implies that for recent modifications 100 years may be a minimal period of time for recovery. Actual recovery time may be expected to be greatly dependent on site quality, the nature and intensity of the initial modifying event, residual habitat components, and subsequent treatments or management actions.

Issue 17: The northern goshawk guidelines provide adequate protection for owl habitat. Critical habitat is not required where the goshawk guidelines are applied.

Service Response: In general, the guidelines outlined in ''Management Recommendations for the Northern Goshawk in the Southwestern United States'' (Reynolds *et al.* 1992) (guidelines) may support the development of some of the forest habitat attributes suitable for owl foraging activities. However, several premises to the guidelines result in conditions that are inadequate for their use as a comprehensive owl forest habitat management plan. The guidelines use a rotational system based on ''balanced'' (evenly apportioned) age/size classes or vegetative structural stages (VSS) not tempered by such factors as site quality, growing conditions, and management intensity. Inclusion of these factors into the calculation of VSS can result in figures significantly different from the allocations specified in the guidelines. The management strategy of apportioning percentages of the forest base to various VSS may also only be workable where each stage accurately reflects the length of time required by each successional phase, particularly in the older age classes. Currently, however, the application by the national forests of the guideline's VSS allocation percentages typically does not incorporate or reflect these factors, and may, therefore, result in landscapes deficient in or without late successional forest stands. In addition, the short time (between 0 and 65 years depending on said factors) allotted for a stand to abide in old-growth condition may not permit development of senescent forest features such as snags and large diameter logs.

The management guidelines also use a period of time that inadequately represents forest age rotations. Currently, the VSS allocations are based on the selection of a maximum growth period derived from the average life expectancy of individual trees. However, the low to moderate survivorship curves exhibited by populations of many tree species may be expected to heavily weigh and reduce the average life expectancy to relatively short lengths of time. Where a small proportion of all regeneration reaches maximum longevity, the use of median life expectancy may be a more appropriate target for setting forest age rotations.

Other guideline specifics such as the number of large diameter trees retained following harvest may result in deficiencies in age-size classes available for snag recruitment and large diameter logs. In addition, the guidelines are only applied to occupied habitat (with the exception of the forest-wide application by the Kaibab National Forest). Occupancy, and therefore management objectives may change over time and prevent the implementation of the long-term objectives required for development and maintenance of the amounts and distribution of late successional forest stages and forested owl habitat needed for the survival and recovery of the owl.

Issue 18: The Service is required to complete an Environmental Assessment and Environmental Impact Statement on the designation of critical habitat as required under the National Environmental Policy Act of 1969 (NEPA).

Service Response: The Service has determined that an Environmental Assessment or Environmental Impact Statement, as defined under the authority of the NEPA, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244). The Ninth Circuit recently upheld this interpretation in *Douglas County* v. *Babbitt,* 48 F.2d 1498 (9th Cir. 1995), petition for rehearing pending. The Ninth Circuit reversed lower court decision and found the requirements for designating critical habitat pursuant to the Endangered Species Act displaced the requirements of NEPA; that NEPA does not apply to federal actions which do nothing to alter the natural physical environment; and the ESA, by preserving the environment and preventing the irretrievable loss of natural resources, furthers the goals of NEPA without requiring an Environmental Impact Statement. Before the Ninth Circuit issued its decision, a federal district court in New Mexico took the opposite position in *Board of County Commissioners of the County of Catron, New Mexico* v. *United States Fish and Wildlife Service,* No. 93–730–HB (D.N.M., October 13, 1994), appeal pending. There the federal district court set aside the final designation of critical habitat for two endangered fish: the spikedace and loach minnow, until NEPA compliance was completed. That case is currently on appeal before the Tenth Circuit. *Catron County Board* v. *U.S.F.W.S.,* No. 94–2280 (10th Cir.).

Issue 19: Following the filing of the lawsuit *Dr. Robin Silver, et al.* v. *Bruce Babbitt, et al.,* the Federal District Court in Arizona in October 1994, ordered the Service to ''publish a proposed designation of critical habitat, including economic exclusion pursuant to U.S.C. Sec. 1533(b)(2).'' The proposed rule does not contain any information on the areas to be excluded for economic reasons.

Service Response: An amendment to the proposed rule for the designation of MSO critical habitat, published December 7, 1994 (59 FR 63162), was published in the **Federal Register** on March 8, 1995 (Supplemental Proposed Rule, 60 FR 12728). The Supplemental Proposed Rule identified the critical habitat areas proposed for exclusion based on information obtained in the draft economic analysis indicating the designation might have disparate economic impacts in certain areas. Comment on the proposed revisions was specifically solicited. At the same time, the Service also published notice of the availability of the economic analysis (60 FR 12730), announced the dates, times and places for four public hearings and reopened the public comment period for an additional 60 days to assure that the public had an opportunity to comment on the economic analysis, the proposed rule and the proposed exclusions.

Issue 20: The conservation agreements developed or being pursued by the Service with various Tribal governments constitute major Federal actions and are subject to the NEPA process. The specifics in the conservation plan for the Mexican spotted owl developed by

the White Mountain Apache Tribe should be described in the proposed rule since it led to the exclusion of proposed critical habitat on the Tribe's lands.

Service Response: Although many have referred to ''conservation agreements'' with various tribes, actually individual tribes have been developing their own resource management plans. The Service has offered technical assistance in reviewing these plans to assure they contain adequate protections for protected species and habitat. However, the action is not a federal action, but a Tribal action. Both the White Mountain Apache and the Jicarilla Apache Tribes took this approach.

The Service, after examining the White Mountain Apache and Jicarilla Apache management plans for the Mexican spotted owl and each Tribe's ability and willingness to enforce the plans, determined the areas under these tribally managed plans did not require special federal management considerations or protection. Although the lands still had the physical and biological features essential to the conservation of the species, they no longer met the second half of the definition of critical habitat. See section 3(5)(A). It is the Service's position that NEPA process is not required for such decisions, since the process for designating critical habitat under the Endangered Species Act displaces further NEPA requirements. See *Douglas County* v. *Babbitt,* 48 F.2d 1498 (9th Cir. 1995), petition for rehearing pending; for further discussion, see Service's Response to Issue 16.

The Navajo Nation is taking another approach. They are developing a Habitat Conservation Plan (HCP) which will include protections for numerous species and their habitat. NEPA compliance will be done for both the HCP and for any application for an accompanying section 10(a) permit.

Issue 21: The Service failed to adequately notify the public of the proposed rulemaking and public hearings. The Service is required to provide for adequate input by the public and other affected parties such as counties and local governments.

Service Response: The Service has exceeded the requirements of the Administrative Procedure Act and the Endangered Species Act for public notification. The final rule listing the Mexican spotted owl as threatened was published in the **Federal Register** on March 16, 1993 (58 FR 14248), and announcements of the listing and availability of the final rule were mailed to Federal, Tribal, state, county, and local agencies and governments, and all interested parties on the Service's mailing list. The rule announced that the Service had concluded that designation of critical habitat was prudent, but found that critical habitat was not then determinable, and was initiating the gathering of information and the studies needed to ascertain critical habitat areas. On March 17, 1993, letters requesting information on owl habitat and distribution were sent to 14 Federal agencies. On April 14, 1993, letters requesting information on owl habitat and distribution were sent to 37 Tribal agencies. Based on the information received, the Service issued the proposal rule to designate critical habitat on December 7, 1994 (59 FR 63162). Prior to issuance of the proposed rule, the Service held a press briefing in Albuquerque, New Mexico, on November 30, 1994, announcing the proposal. In addition, the proposed rule was sent to affected Federal, Tribal, state, county, and local agencies and governments, and notices of the availability of the rule were sent to all interested parties on the Service mailing list. Public notices of the proposal for publication as legal notices were also sent to 18 newspapers throughout the four-state region on December 5, 1994. The general and newspaper notices requested data and comments from the government and public on all aspects of the proposal, including data on the economic impacts of the designation. The notice also announced a 90-day comment period open until March 7, 1995. On December 19, 1994, the Service sent a request for information on the potential economic impacts of designating critical habitat to 13 Federal, 12 Tribal, and 10 state agencies, and 4 Governors' and 42 county government offices. A Draft Economic Analysis (DEA) was prepared based on the information received, and a notice of the availability of that draft was published in the **Federal Register** on March 8, 1995 (60 FR 12728, 60 FR 12730). The publication also proposed several revisions to the original proposal, solicited additional information and comments, opened an additional 60-day comment period extending to May 8, 1995, and announced the schedule and location of public hearings. More than 700 parties on the Service's mailing list also received an announcement of the above subjects. On February 23, 1995, the Service also sent for publication as legal notices in 36 regional newspapers, an announcement of the availability of the DEA, solicitation for additional information and comments, the opening of the additional comment period, and the schedule and location of public hearings. Public hearings were held in Santa Fe and Socorro, New Mexico, on March 22 and 23, 1995, and Tucson and Flagstaff, Arizona, on March 29 and 30, 1995. Comments from the public on the critical habitat proposal and DEA were recorded and evaluated for input to the final designation. More than 800 letters addressing the proposal were received during the comment periods. The correspondence and comments have been evaluated in the decision whether to designate critical habitat.

Issue 22: The Service is incorrect in citing the use of clearcutting as the prevailing method of timber harvest, and timber harvest as the primary threat to the owl.

Service Response: The Service does not consider clearcutting to be the prevailing method of timber harvest. The final rule to list the owl as threatened and the proposed rule to designate critical habitat identify the even-age harvest methods of shelterwood treatments as the prevailing method of timber harvest, and their use and rate of implementation as the primary threat to the subspecies.

Issue 23: The Service should disclose the analysis and specific scientific data from it which derived its estimates and on which it based the proposal to designate critical habitat.

Service Response: The data and information used to develop the proposed rule to designate critical habitat were summarized in that document, as well as in the proposed and final rule to list the species as threatened, and the two delisting petition finding notices published in the **Federal Register**. Additional information is available in the references cited in these rules and notices. This final rule incorporates information from previous rules and notices, comments received on the proposed rule to designate critical habitat, and data presented in the draft Recovery Plan.

Issue 24: The conclusions drawn from the northern spotted owl (Interagency Scientific Committee) are not applicable to the Mexican spotted owl.

Service Response: The Service used four general principles developed by the Interagency Scientific Committee and others working in the field of conservation biology during the initial process of delineating proposed critical habitat units (see Background section, ''Criteria for Identifying Candidate Critical Habitat Units''). These principles are widely accepted by biologists as a means to achieve viable populations throughout the range of a

species, and to facilitate species' long-term survival and recovery. Specific conclusions drawn during the processes of listing and designation of critical habitat for the northern spotted owl were not used as a basis for this final rule.

Issue 25: Management of critical habitat will have impacts on highway maintenance and safety.

Service Response: Existing highway corridors typically do not have the habitat components relevant to management of owl critical habitat. Therefore, consultations on critical habitat would not be required where there is an action agency determination of ''no effect''. In instances where an action may affect critical habitat, consultation will be required. However, the Service does not anticipate that significant modification of planned highway projects will result from consultation on critical habitat.

Issue 26: Management of critical habitat will have an impact on livestock grazing.

Service Response: Livestock grazing is not known to have any direct impact to the components of upland forest and canyon owl habitats, and will likely not be subject to consultation or restriction in these areas. Livestock grazing may have both direct and indirect effects to the structural components of canyon and montane riparian habitat and to owl prey communities. If requested by Federal action agencies, consultation will likely entail the monitoring of grazing use, the establishment of conservative maximum allowable use levels and the implementation of grazing use standards that would attain or restore good to excellent range conditions in riparian habitats. Much of the consultation on livestock grazing in riparian habitat is expected to deal with implementation of *existing* action agency guidelines and standards.

Issue 27: Critical habitat will prevent recreational activities and access to public lands.

Service Response: Most recreational activities are not known to have any direct impact to the structural habitat components of upland forest and canyon habitats, and will likely not be subject to consultation on critical habitat in these areas. Some recreational activities may have both direct and indirect effects to the structural components of canyon and montane riparian habitat. If requested by Federal action agencies, consultation will likely entail the monitoring and regulation of the volume of recreational use where riparian habitat impacts have occurred or have the potential to occur. Few, if any, restrictions on recreational use of critical habitat areas are likely to result from critical habitat designation.

Issue 28: Water development projects for the City of Blanding, Utah, may be impacted by the designation of critical habitat.

Service Response: Future development of the City of Blanding's water rights on the Manti-La Sal National Forest is already subject to Forest Service review processes, including review for consistency with the Forest Plan standards and guidelines and NEPA procedures. Review of the effects of water development on critical habitat would be part of that process, and so should not impose an additional procedural burden on project applicants. Any activities proposed within the critical habitat unit would be evaluated for effects to primary constituent elements. The scope of such projects mostly entails limited, site-specific impacts that are unlikely to adversely affect the value of the critical habitat unit.

Issue 29: Management of critical habitat for the Mexican spotted owl will conflict with the management objectives of other animal and plant species, ecosystem objectives, and the Mexican gray wolf reintroduction program proposed for southern Apache National Forest.

Service Response: The comments received did not specify how conflicts may arise between owl critical habitat and other management objectives. Critical habitat management primarily focuses on the maintenance of habitat features in mixed conifer and pine-oak habitat types that support existing territories, and the maintenance of good montane riparian habitat conditions. It does not emphasize the creation of these features where they do not currently exist, or do not have the potential to naturally occur. It also does not require maintenance of owl habitat components across all areas.

The management approach to critical habitat addresses diversity at the landscape scale by maintaining spatial variation and distribution of age classes, and at the stand scale by managing for complex within-stand structure. The methods to attain or conserve the desired measure of diversity vary, but are designed to maintain existing mature/old forest characteristics while allowing some degree of timber harvest and management of other objectives such as tree density control and prescribed fire. Older forests are productive successional stages that provide favorable environments for diverse assemblages of plants and animals. The maintenance of this underrepresented seral stage at landscape and stand scales will provide and enhance biological diversity. Therefore, critical habitat management does not preclude managing for other objectives. In addition, critical habitat management is adaptive and will incorporate new information on the interaction between natural disturbance events and forest ecology. The Service continues to support sound ecosystem management and maintenance of biodiversity.

Issue 30: Areas within critical habitat with little or no timber harvest threats to owl habitat should be deleted from the final designation.

Service Response: The use and rate of timber harvest under even-age harvest systems were identified by the Service as the primary threat to the habitat of the Mexican spotted owl. However, other habitat modifying activities have also been identified in the proposed rule as potentially affecting owl habitat, and may require consideration of habitat impacts and consultation. These include vegetative treatments to manage insects and disease, timber salvage, density control of forest and woodland stands, and fire prevention and control programs. However, areas where there is no threat to owl habitat components are functionally excluded from critical habitat since no consultation would be required.

Issue 31: Critical habitat should be modified to reflect changing management practices. Specific areas of critical habitat should revised to reflect new or more detailed information.

Service Response: The Service will incorporate new or more detailed information as it becomes available and will reevaluate critical habitat areas as needed. Periodic modification of critical habitat may occur at later dates. The Service will work with interested agencies or entities with expertise and available data on the refinement and revision of designated critical habitat; however, the Service's court-ordered deadline and requirements for public notice and comment on exclusions preclude any significant revisions at this time.

Issue 32: One commenter maintained that critical habitat designation would have a significant economic impact on the Mount Graham Steward Observatory, Discovery Park and State Highway 366, electronic site development, and campground expansion projects.

Service Response: The Service's position (also stated in the Draft Economic Analysis) is that there is little or no potential for economic impacts as a result of consultation requirements to these proposed or ongoing projects. The

reasons for this are the limited amount of habitat affected by the projects and the negligible effects to the viability of the Pinalenos Mountains Critical Habitat Unit expected from these site-specific actions. Therefore, significant impact to these projects from critical habitat designation are unlikely.

Issue 33: The Service should describe the criteria used in the preparation of the management alternatives outlined in its request to land-managing agencies/governments for information on economic impacts of critical habitat designation. The Service should also describe how progress towards meeting critical habitat objectives is to be ascertained.

Service Response: The alternatives were developed based on existing and proposed management guidelines for owl habitat. The first alternative describes the guidelines developed by the Forest Service and in place up until formal adoption of the Mexican Spotted Owl Recovery Plan. The second alternative constitutes a summary of the draft Recovery Plan management recommendations for mixed conifer and pine/oak forest types. The third alternative includes the same Plan recommendations with additional management guidelines considered for ponderosa pine habitat types. The Service would measure progress towards achieving management objectives by evaluating action agency compliance during consultation.

Issue 34: The Forest Service is committed to implementing the Mexican Spotted Owl Recovery Plan; therefore, the Plan precludes the need for special management and critical habitat for the subspecies.

Service Response: The Service commends the Forest Service for initiating a process to incorporate recovery plan recommendations into their Forest Planning process and to move to mostly uneven age silvicultural regimes. However, the Recovery Plan is a draft document at this time, and the Service is awaiting the results of extensive peer review and public comment, which could result in a final recovery plan that differs from the draft document. In addition, the Recovery Plan is not a ''decision document'' as defined by NEPA, and does not allocate resources on public lands. The implementation of the recovery plan is the responsibility of Federal and state management agencies in areas where the subspecies occurs. Implementation is accomplished by the incorporation, as regulatory mechanisms, of the appropriate portions of the Recovery Plan into agency decision documents such as forest plans, park management plans, and state game management plans. Such documents are then subject to the NEPA process for public review and selection of alternatives. At that point, if implementation is effective, it may supersede the need for special management, and critical habitat may be withdrawn. Until public comment is received and analyzed on both the Recovery Plan and the Forest Service NEPA process, consideration of changes in Forest Service management would be predecisional and premature.

Issue 35: Service acceptance of management plans that preclude designation of critical habitat on certain lands is inappropriate.

Service Response: The Act provides for numerous mechanisms to conserve both listed and unlisted species. Critical habitat is one of those mechanisms. To qualify as critical habitat, an area must be one that may be in need of special management considerations or protection. The Service interprets that requirement to mean that if adequate management for a species is already in place, ''special management considerations or protection'' are not necessary, and the species can be conserved without the added regulatory requirements associated with critical habitat.

Issue 36: The Forest Plans are outdated and are not being followed in many respects. The Service should consider the management practices actually implemented in recent years. The Service should also consider the Forest Plan amendments in progress that provide for the needs of the subspecies. The Service should also consider a management plan for ponderosa pine habitats approved by the Manti-La Sal National Forest in 1994.

Service Response: The Service understands that the Forest Plans are outdated, and that other regulatory mechanisms such as Interim Directive #2 (ID2) have been in place to direct management of owl habitat. The Service is also aware of the amendments being prepared for all the national forests in the Southwest Region of the Forest Service. However, past practices such as ID2 and forest plan standards and guidelines were assessed as inadequate regulatory mechanisms and resulted in the listing of the owl. In addition, ongoing policy changes are often in flux, are sometimes contradictory, and until completed, do not constitute established policy that may be used to determine management objectives and directions.

The management plan for ponderosa pine habitats on the Manti-La Sal National Forest has not been provided to the Service by the Forest. Furthermore, the plan is an internal guideline and has not been incorporated into the Forest Plan. However, the Service strongly encourages the development and implementation of improved management plans, and their incorporation into Forest Plans.

Issue 37: The proposal to designate critical habitat does not coincide with the draft Mexican Spotted Owl Recovery Plan. For example, the recovery plan allows ''unrestricted'' management practices above 8,000 feet on the Kaibab Plateau, yet a considerable amount of critical habitat proposed in that area is above that elevation.

Service Response: Recovery planning and the designation of critical habitat are two different processes, each with its own time lines and purposes under the Act. Critical habitat designation is required, if both prudent and determinable, to be designated concurrently with the listing of a species. If not determinable at the time of listing, an additional year is allowed under law. Recovery plans, however, are not under statutory deadlines, although Service policy is to have final recovery plans in place within 30 months of listing a species as threatened or endangered. Thus, as a general rule, critical habitat precedes recovery plan development.

In the case of the Mexican spotted owl, the development of a critical habitat proposal was begun before the recovery planning process had begun, and was published in the **Federal Register** before the draft Recovery Plan was completed. The requirements of the Act and its implementing regulations, as enforced by a Federal Court, did not allow enough time for the Service to go back to the beginning of the critical habitat development process, develop a new proposed rule, and finalize critical habitat by the deadline ordered.

Critical habitat identifies areas containing the physical and biological features essential to the life history needs of a listed species, and that may need special management or protection. Designation of critical habitat does not specify what those special management considerations or protections are; those questions are addressed during the recovery planning process. In other words, critical habitat areas are those where the Service believes greatest management emphasis for a listed species should be placed, while recovery planning explains what that management should be.

In the specific instance involving the Kaibab Plateau, the area is ''unrestricted'' only if no nesting or roosting owls are located. The Recovery Team believes nesting and roosting is

unlikely to occur; however, the plan may be modified should a significant resident owl population be discovered prior the Service's adoption of a final recovery plan. At any rate, once a final recovery plan is adopted, the Service will consider whether to revise critical habitat through a separate rule making process.

Issue 38: Owl use of the habitat above canyon rims is minimal on the Monticello Ranger District of the Manti-La Sal National Forest. Radio telemetry indicates that fewer than 10 percent of recorded locations occur in these areas, with no data on actual use of the area.

Service Response: The Service agrees that very little, if any, nest/roost habitat exists on the mesa tops that constitute the critical habitat unit on the Manti-La Sal National Forest. However, radio telemetry data indicate owl presence in this habitat, and the 10 percent figure cited by the Forest may be considered a minimum, with radio locations probably making up between 10 to 25 percent of all locations (David Willey, High Desert Research Collective, pers. comm., 1995). The commenter is correct in noting that there are no data on the behavioral use of the habitat at the various locations. This is a limitation inherent in this method of analyzing the spatial use of habitat.

Issue 39: Additional areas in Utah should be considered since critical habitat contains less than five percent of known owl sites in Utah. In addition, these owl sites and habitat may experience threats from such sources as recreational activities.

Service Response: The Service, in the final rule to list and the critical habitat proposal, determined that the primary threat to the species was commercial timber harvest. The majority of owl sites in Utah are found in steep canyon habitats within areas not managed for timber harvest. Although there are other threats to canyon-nesting owls besides stand modifying activities, the Service has been unable to find evidence that these threats are significant to the owl population as a whole. The determination was made that these actions can be dealt with through consultation under section 7 of the Act without designation of critical habitat.

Economic Issues

Issue 40: Each critical habitat unit is a separate ''area'' as that term is used in 16 U.S.C. 1533(b)(2), and requires the Service to consider economic impacts by individual unit.

Service Response: The Service is required to use the best available data to conduct its economic analyses under the Endangered Species Act. In the case of the Mexican spotted owl, county level data were not sufficiently reliable to be used to estimate economic impacts for each of the 28 counties. Therefore, the data were aggregated into three subregions. This was the required aggregation for the purposes of creating a viable economic model that could be used in estimating economic impacts.

Issue 41: Several commenters were concerned that the economic analysis hides and dilutes the impact of actions on rural communities, especially when data includes large urban areas.

Service Response: The smallest subdivision with standard, meaningful economic data typically is an individual county; thus, economic impacts are based on county data for regional effects, whereas statewide or nationwide data and effects are addressed only when they become economically relevant. As stated in the economic analysis, urban areas within the region, including Albuquerque, Phoenix, and Tucson, were not included in order to avoid diluting impacts.

Issue 42: Several people stated that the economic analysis does not consider the multiplier effect of base manufacturing impacts including secondary and primary manufacturing jobs and sales, support industries, government jobs, and revenues to local counties.

Service Response: The analysis considers the full impacts due to changes in wood sector businesses and suppliers and the impact due to employee spending changes, all of which are the components of the multipliers. Impacts on communities' revenues and taxes were considered, based on available information, including what was provided by county officials.

Issue 43: Some respondents noted that the economic analysis did not consider reduced property and sales taxes due to the proposed action, and stated that the analysis used Federal payments in lieu of taxes (PILTs) as justification for reductions in counties' shares of timber sale receipts.

Service Response: The economic analysis discusses impacts on property taxes and offsetting PILT payments. According to sources used in the analysis, the net impact will not affect most counties, but will affect two counties more than others. While PILT payments are not stumpage taxes paid by the U.S. Forest Service, they are offsetting funds paid to the counties. Since they offset other taxes, they have little impact to the U.S. Treasury.

Issue 44: A few groups commented that the economic analysis fails to consider the increased cost of doing business for forest products companies, and fails to consider the potential impact to shareholders of the companies.

Service Response: The analysis reports changes in sales revenue for the region, which includes impacts to shareholders of companies in the region. The increased cost of doing business that may occur as a result of higher timber prices is a distributional effect within the region, in that the owners of the timber will benefit from higher timber prices.

Issue 45: One commenter noted that the analysis does not analyze the effects of the withdrawal of Federal timber from the market nor the subsequent changes in property and timber values for private timber owners.

Service Response: Critical habitat designation affects only Federal timber harvest; however, reductions in timber harvest from public lands could increase the value of timber on private lands, thereby benefitting non-Federal timber owners.

Issue 46: One comment was received that the proposed action would cause loss of employment for government workers involved in timber sales, and noted that the economic analysis does not adequately address the costs of not having a forest products industry in the Southwest operating on Federal forests.

Service Response: Most Federal forests in the region are not affected by the proposed action. The proposed CHUs within national forests represent less than 19 percent of the Federal forest acres in the Southwest region of the U.S. Forest Service—the timber harvest is estimated to decline about the same amount. This proposed action will not close down the forest products industry in the Southwest, nor substantially affect Federal employment related to timber sales.

Issue 47: One individual noted that the analysis does not address the impacts of designating critical habitat for the Mexican spotted owl to other previously listed species across the U.S.

Service Response: The impacts estimated in the report reflect only the proposed critical habitat designation for the Mexican spotted owl, as directed by the Endangered Species Act. Appendix E of the economic analysis provides information from the Service about other species that may be affected by this proposed action.

Issue 48: One commenter stated that public opinion polls and non-scientific work have no place in the economic analysis.

Service Response: Data from all credible available sources were considered in conducting the analysis.

In some cases, information requested from Federal, State, local, and Tribal agencies was not provided. Surveys relevant to the topics were used to indicate public preferences for policy actions, an important consideration to public agencies mandated to manage public resources.

Issue 49: A few comments were received maintaining that the exercise was conducted to prove that critical habitat designation is a minor inconvenience, and that the analysis was not an unbiased attempt to describe regional economic impacts.

Service Response: The analysis was undertaken without bias toward a particular goal or level of economic impacts. The results reflect appropriate impacts considering that most timber acres in the Southwest region are not affected by the proposed critical habitat designation.

Issue 50: One group stated that the nonmarket benefits mentioned in the economic analysis assume increased value due to recreational uses such as fishing, hunting, and picnicking, and ignore that these activities occur presently and historically, and that these activities are complementary to timber harvesting. The same group maintained that access to the forest will be reduced due to lack of road maintenance.

Service Response: Some recreational activities may benefit from timber harvest programs (e.g., hunting for species that rely on forest edges), while others (e.g., sightseeing and wilderness camping) will not. While timber programs may contribute to forest access, recreating in areas from which timber has been cut recently may be discontinued. The acres proposed as CHUs will continue to be accessible for recreational uses.

Issue 51: One person wrote that the economic analysis made nonmarket items appear to be the major areas of value resulting from the protection of the owl. Nonmarket values are value judgments, not pure science.

Service Response: Nonmarket values are likely to be the primary benefit resulting from the proposed action. Individuals hold values for resources for personal use and other reasons. People may value continued existence of a resource they do not personally use because of environmental concerns, to preserve the option to use the resource in the future, or to endow the resource to coming generations. Nonmarket values are estimated using contingent valuation method (CVM). This technique is generally accepted as an appropriate means of evaluating this class of values.

Issue 52: Several commenters criticized the report for not including dollar estimates of the nonmarket benefits resulting from the proposed action.

Service Response: Quantifying species benefits is a costly and lengthy process that was not possible within the time constraints of the project. Even with results from such a study, allocating the benefits of preservation and recovery of an endangered species among the various actions required is an extremely difficult task. If species conservation were accomplished entirely through designation of critical habitat, then the full value of benefits could be attributed to that action. However, conservation is achieved with multiple interactive actions (e.g., Federal listing, protection under State laws), each of which may be essential to recovery and no one of which can be singled out as the sole means by which a species is conserved or recovery attained. Without a clear delineation of the results of each management action, it is not possible to disaggregate the sum of benefits to identify that portion directly attributable to critical habitat designation.

Issue 53: The comment was made that the economic analysis omitted major items such as total cost when the Forest Service implemented its pre-listing owl management guidelines, and the resulting impacts on activities such as recreation, grazing, and mining.

Service Response: The economic analysis estimates the impact of the proposed critical habitat designation for the Mexican spotted owl. The Service has indicated in the proposal that the activity of concern is timber harvest. Other activities, such as recreation, mining, and grazing, would not be affected by the proposed action unless they involve changes to constituent elements of critical habitat. Listing a species provides protection under the jeopardy standard. Additional protection is provided through the adverse modification standard after critical habitat is designated. These are separate actions between which the economic analysis clearly distinguishes.

Issue 54: Several letters were received commenting that the analysis excluded the impacts of wildfire that will result from the proposed action.

Service Response: The Service recognizes the danger fire poses to the owl. When the owl was listed and when critical habitat was proposed the Service encouraged reducing this risk with proper forest management. A relatively small portion of the region identified by commenters as being ''under threat of catastrophic fire'' is proposed for designation. The 3.6 million acres of U.S. Forest Service land affected by this proposal represents less than 20 percent of the land under the agency's jurisdiction in the 28 counties. The trend of increased fire danger began decades ago with forest management practices since the 1950s, including fire suppression. This is not a new threat in the region, nor one that has suddenly arisen because of the proposed action. The forest in its current condition is noted as being highly susceptible to fire, *before* critical habitat was proposed.

Issue 55: One timber industry representative asked whether Table 8 reflects total national forest harvests or the harvest from CHUs.

Service Response: The annual harvest levels provided in the report reflect only the harvests projected from the proposed CHU acres. This harvest level was indicated by forest managers. More than 80 percent of Federal forests, and all of non-Federal forests are not affected by the proposed action, and timber harvest can continue in addition to the harvest levels estimated in the report.

Issue 56: Several respondents claimed the regulations proposed under critical habitat designation are targeted at specific mills or industries. Several letters stressed the importance of preserving and enhancing private sector employment in an area where over 23 percent of jobs are in government.

Service Response: While the impacts reflect changes in Federal and private sector activity, no specific firms or industries are targeted by the proposed action for closure or elimination.

Issue 57: A group of counties in eastern Arizona noted that the analysis failed to take into account the impacts of proposed timber harvest restrictions on local schools. For example, one county noted its schools depend heavily on Federal timber fees to maintain their programs—15 percent of the school district budget is derived from U.S. Forest Service fees. The counties claim loss of these revenues will result in closure of the schools.

Service Response: The county cited as an example has approximately 492,000 acres of National Forest, with about 164,000 acres (about one-third of the acres) proposed for inclusion in critical habitat. Based on the data from this comment, this implies that less than five percent (one-third of 15 percent) of the budget of these schools would be affected if all timber harvest and other activities were eliminated in the critical habitat units. This worst case scenario is unlikely to occur.

Issue 58: One letter stated that Appendix D of the draft economic

analysis reviews below-cost timber sales and indicates that critical habitat will reduce losses to the U.S. Treasury, in turn benefitting private timber owners who hold only 85,000 acres in proposed CHUs. The analysis was alleged to be incomplete, failing to account for gross ineffiencies of the Forest Service management, increased costs due to environmental regulations, and increased costs of managing forests under the National Environmental Policy Act.

Service Response: Appendix D provides an overview of below-cost timber sales, pointing out that the U.S. Treasury could benefit if timber harvests were reduced. The analysis recognizes but does not quantify the added costs of the proposed action to the U.S. Forest Service. The agency presently incurs management costs, and the cost of environmental and National Environmental Policy Act compliance. Adding to the costs incurred by the U.S. Forest Service would generate even larger deficits. The analysis cited one of the possible benefits as increased demand for timber from all private landowners in the region, not only the 85,000 acres in the critical habitat units.

Issue 59: Several people noted that increased sales from changes in recreation occur outside the region and do not provide additional value to the population within the region.

Service Response: Part of expenditures by those who recreate is outside the region, but part is within the region, possibly including lodging, gas, food, and other supplies, thereby increasing the economic level of the local community. Increased expenditures can include both increased levels per person and increased numbers of recreationists.

Issue 60: One writer stated that designation of critical habitat caused the closure of most sawmills in the region since 1989.

Service Response: The designation of critical habitat only becomes effective 30 days from the date of this final rule.

Issue 61: The analysis used 1991 data as a baseline, which does not isolate the impacts of critical habitat designation, rather it includes four years of impacts including listing. This fatally flaws the entire analysis.

Service Response: The baseline year used in the analysis is provided as a basis of comparison only, and is not intended to imply the changes have occurred since that year. The impact analysis was conducted using a ''with and without'' framework for comparison, rather than with a ''before and after'' framework in which the impacts would have included previous actions to protect the owl. The 1991 data are the most current available for conducting the impact analysis.

Issue 62: The economic analysis failed to consider impacts due to lumber price increases. The average framing lumber price in 1990 of $233.54 per 1000 board feet rose to a 1994 price of $411.02.

Service Response: Any recent changes in timber price are not due to the proposed action because the regulation has not yet been enacted.

National Environmental Policy Act

The Service has determined that an Environmental Assessment, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. A notice outlining the Service's reasons for this determination was published in the **Federal Register** on October 25, 1983 (48 FR 49244).

Regulatory Flexibility Act and Executive Order 12866 (E.O. 12866)

This rule was not subject to Office of Management and Budget review under E.O. 12866. The Department of the Interior certifies that this designation will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*). Also, no direct costs, enforcement costs, information collection, or recordkeeping requirements are imposed on small entities by this designation. Further, the rule contains no recordkeeping requirements as defined by the Paperwork Reduction Act of 1980.

Takings Implications Assessment

The Service has analyzed the potential takings implications of designating critical habitat for the owl in a Takings Implications Assessment prepared pursuant to requirements of Executive Order 12630, ''Governmental Actions and Interference with Constitutionally Protected Property Rights.'' The Takings Implications Assessment, available upon request (see **ADDRESSES**) concludes that the designation does not pose significant takings implications.

References Cited

A complete list of all references cited herein, as well as others, is available upon request from the New Mexico Ecological Services State Office (see **ADDRESSES** above).

Author(s)

This final rule was prepared by Steve Spangle, U.S. Fish and Wildlife Service, Ecological Services—Endangered Species, Albuquerque, New Mexico; and Jennifer Fowler-Propst, Sonya Jarhrsdoerfer, and Marcos Gorresen, U.S. Fish and Wildlife Service, Ecological Services (see **ADDRESSES**).

The economic analysis was prepared by Richard L. Johnson and Dirk D. Draper, U.S. Fish and Wildlife Service, National Biological Services, Midcontinent Ecological Science Center, Fort Collins, Colorado; and Earl Ekstrand and John R. McKean, Colorado State University, Fort Collins, Colorado.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations is amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

§ 17.11 [Amended]

2. Section 17.11(h) is amended by revising the ''Critical habitat'' entry for ''Owl, Mexican spotted,'' under Birds, to read ''§ 17.95(b)''.

3. Section 17.95(b) is amended by adding critical habitat for the Mexican spotted owl *(Strix occidentalis lucida),* in the same alphabetical order as this species occurs in § 17.11(h).

§ 17.95 Critical habitat—fish and wildlife.

* * * * *

(b) * * *

Mexican Spotted Owl *(Strix occidentalis lucida).*

For the States of Arizona, Colorado, New Mexico, and Utah, critical habitat units are depicted on maps on file and are available for inspection by appointment at: U.S. Fish and Wildlife Service, Arizona Ecological Services State Office, 2321 West Royal Palm Road, Phoenix, Arizona 85021, telephone (602) 640–2720; U.S. Fish and Wildlife Service, Colorado State Sub-Office, 764 Horizon Drive, South Annex A, Grand Junction, Colorado 81506, telephone (970) 243–2778; U.S. Fish and Wildlife Service, New Mexico Ecological Services State Office, 2105

Osuna N.E., Albuquerque, New Mexico 87113, telephone (505) 761–4525; U.S. Fish and Wildlife Service, Utah Ecological Services Field Office, Lincoln Plaza, 145 East 1300 South, Suite 404, Salt Lake City, Utah 84115, telephone (801) 524–5001.

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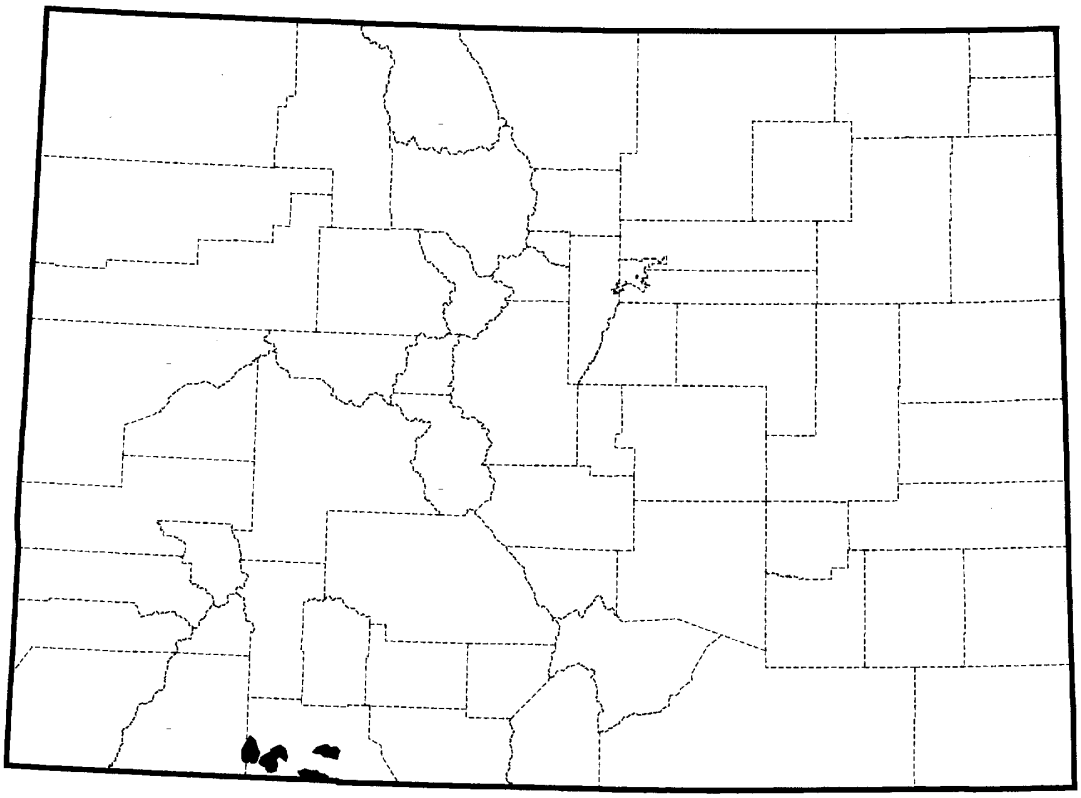
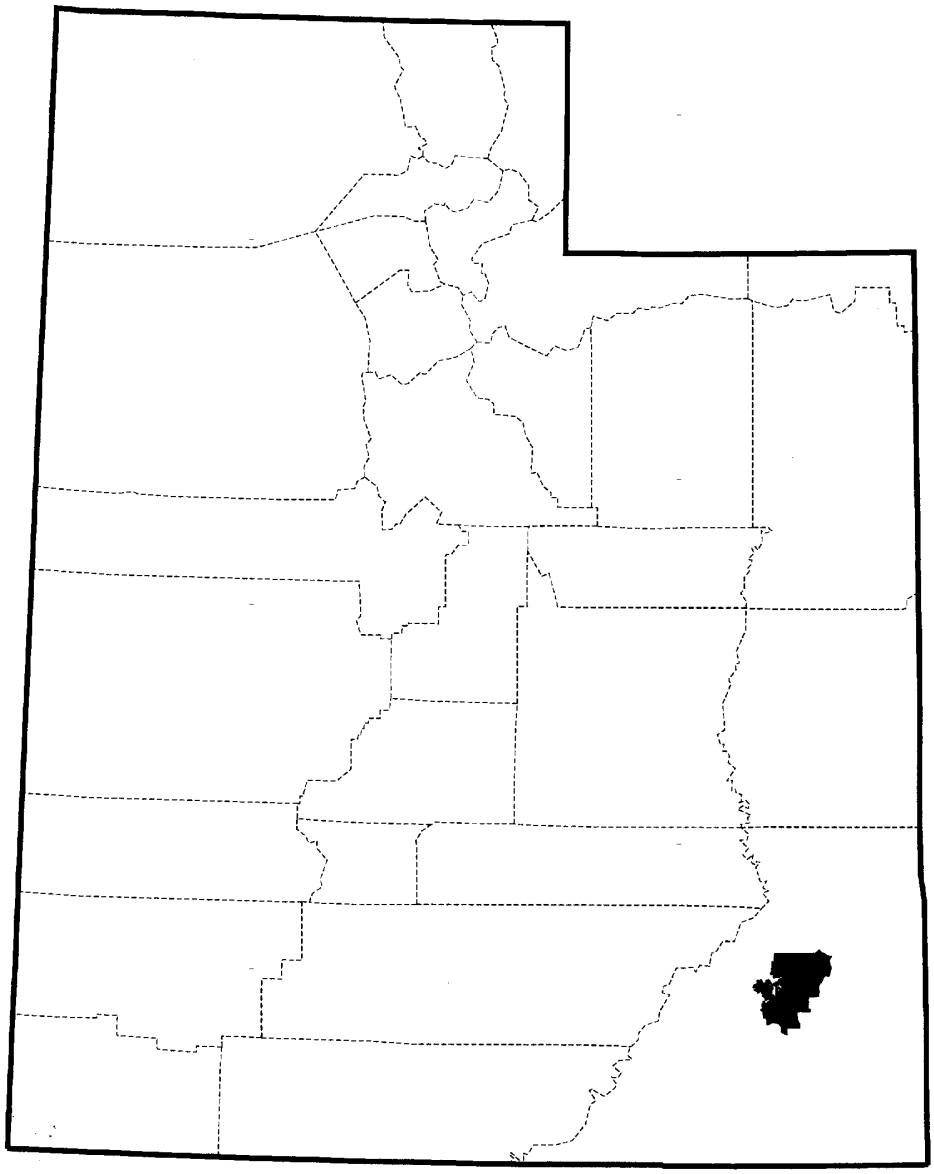
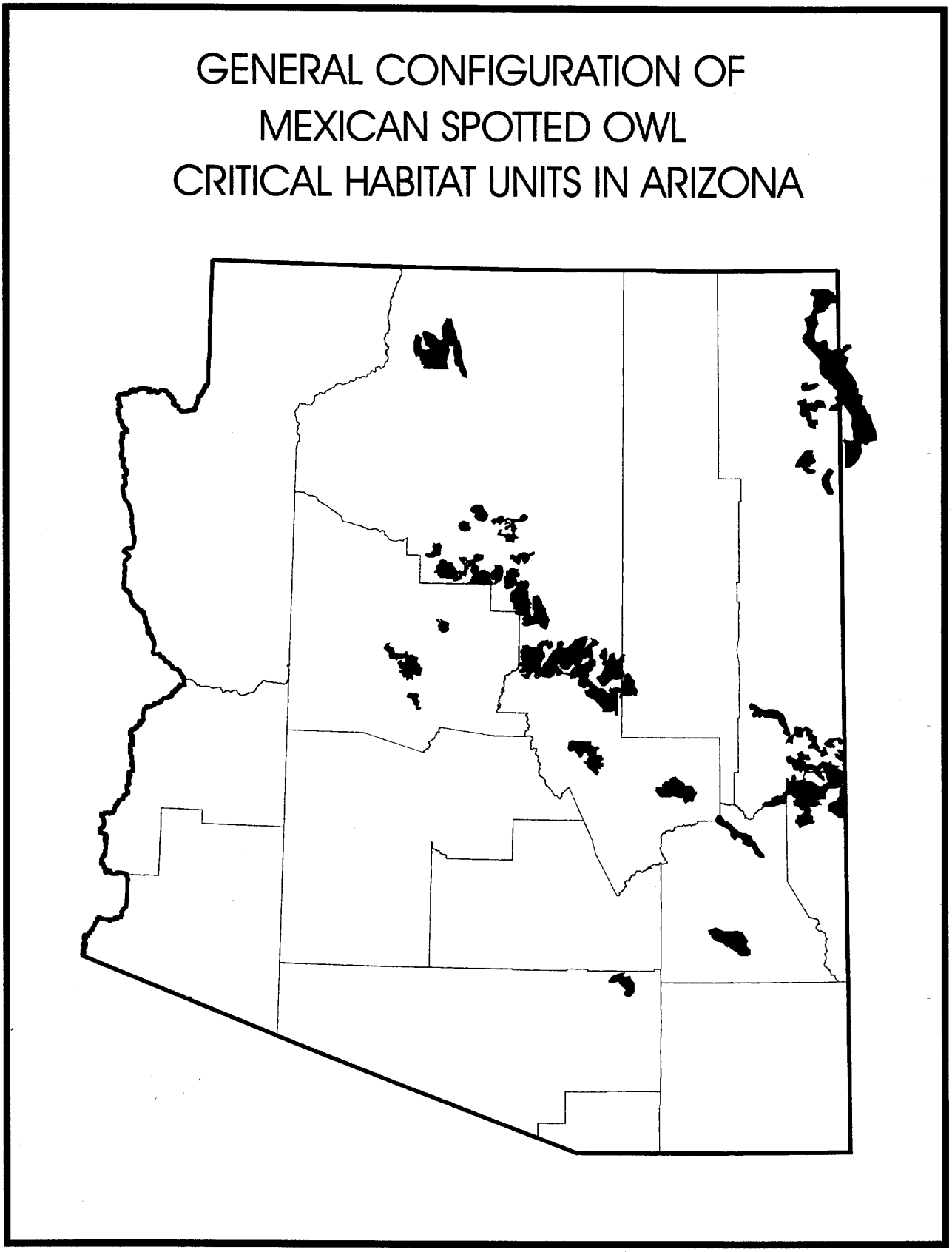
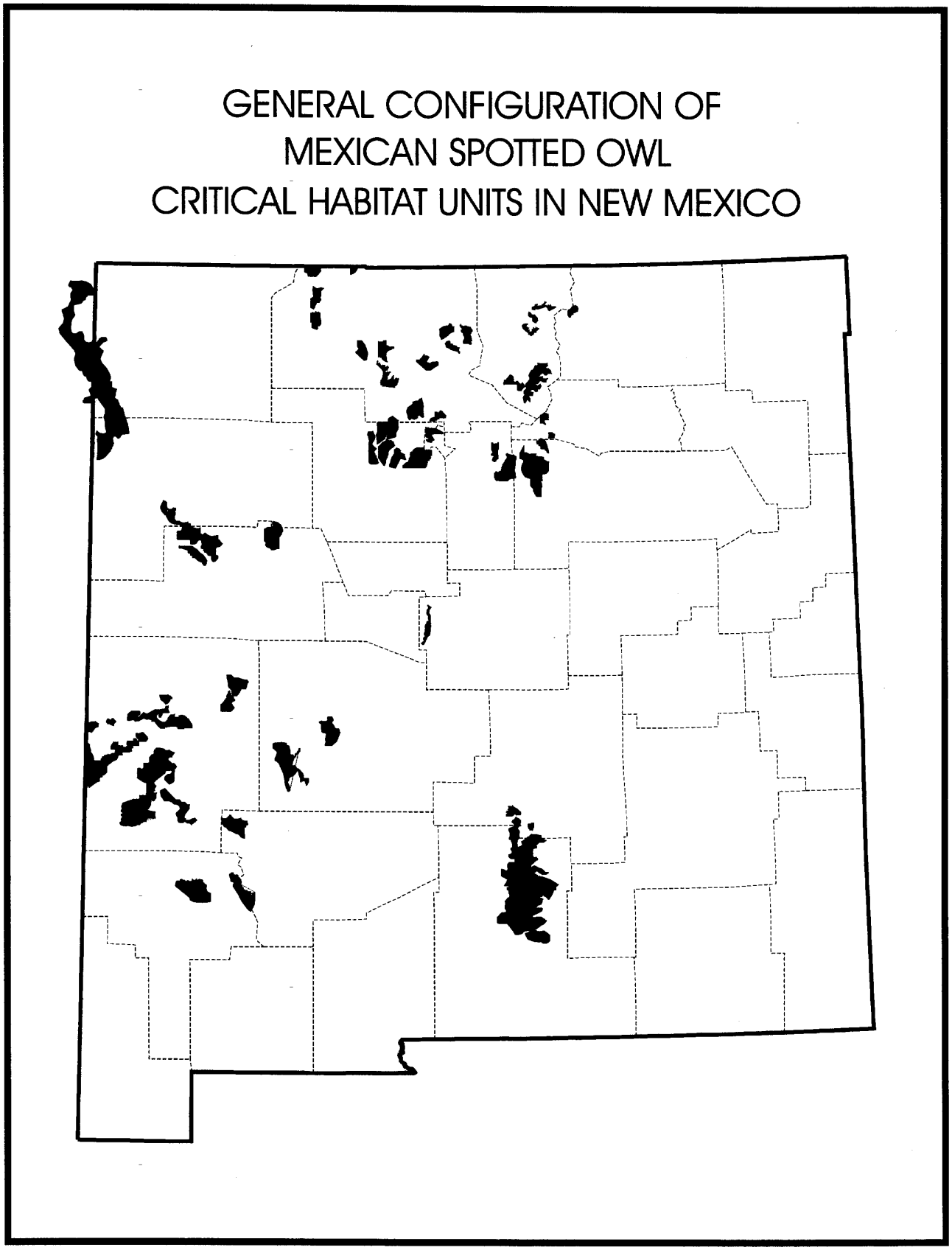
GENERAL CONFIGURATION OF MEXICAN SPOTTED OWL CRITICAL HABITAT UNITS IN COLORADO



GENERAL CONFIGURATION OF MEXICAN SPOTTED OWL CRITICAL HABITAT UNITS IN UTAH




GENERAL CONFIGURATION OF
MEXICAN SPOTTED OWL
CRITICAL HABITAT UNITS IN ARIZONA



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Primary constituent elements: Mexican spotted owl habitat that includes, but is not limited to, those habitat components providing or with the potential to provide for nesting, roosting, or foraging. Forested habitats used for nesting and roosting are characterized as supporting mature stand attributes including high canopy closure, multi-layered canopies, coniferous vegetation (sometimes including a hardwood understory), large diameter trees, high basal areas of live trees and snags, and high volumes of large logs. Nesting and roosting habitat also supports owl foraging activity; however, a wider array of habitat attributes may be found in areas used solely for foraging, including fairly open and non-contiguous forest, small openings, woodland, and rocky slopes. Canyon habitat is typically characterized by the cool, humid conditions found in deep, steep-walled, fractured structures. Canyons frequently contain patches or stringers of riparian and conifer forest, and adjacent slopes and mesa tops are vegetated by a variety of plant associations. Owl habitat may exhibit a mixture of attributes between the forested and canyon habitat types.

Dated: May 25, 1995.

George T. Frampton, Jr.,

Assistant Secretary for Fish and Wildlife and Parks.

[FR Doc. 95–13606 Filed 6–5–95; 8:45 am]

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