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Wildlife Supplemental Report to the Draft EIS

For Federally-Listed Wildlife Species, Bald and Golden Eagles, Management Indicator Species, and Migratory Birds

Forest Plan Revision DEIS

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Preface

The information in this specialist report reflects analysis that was completed prior to and in conjunction with the completion of the Draft Environmental Impact Statement (DEIS) for the revision of the 1987 Coconino National Forest Land Management Plan (the Plan). The primary purpose of specialist reports associated with the DEIS is to provide detailed information to assist in the preparation of the DEIS. As the DEIS was prepared, review-driven edits to the broader DEIS resulted in modifications to some of the information contained in some of the specialist reports. As a result, some reports no longer contain information and analysis that was updated through an interdisciplinary review process and is included in the DEIS in its entirety. This specialist report retains the additional information on the environmental consequences that was not included in the summarized information in the DEIS. However, analysis and information for this resource that is included in its entirety in the DEIS is not duplicated in this report. Efforts have been made to ensure that the retained information in the specialist reports is consistent with the DEIS. If inconsistencies exist between specialist reports and the DEIS, the DEIS should be regarded as the most current, accurate source of analysis.

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Introduction

This report supplements the analysis in the Draft Environmental Impact Statement (DEIS) (November 2013) for federally-listed and candidate wildlife species, bald and golden eagles, management indicator species (MIS), and migratory birds. It is not a stand-alone document. The majority of information and analysis is contained within the DEIS. This report provides only background analysis and information NOT contained in the DEIS. Core Revision Team members (Yewah Lau, Heather Green, Sara Dechter, Noah Bard, and Emily Williams) are the primary authors of the DEIS and provided reviews and edits to this document and previous drafts to ensure consistency with the DEIS and to avoid duplication of information between the two documents.

Relevant Laws, Regulations, and Policy

All alternatives are designed to guide the Coconino NF's management activities in meeting all applicable Federal and State laws, regulations, and policies.

The Forest Service is legally required to comply with a number of federal laws, regulations, and policy regarding wildlife, including: the Endangered Species Act of 1973, as amended; the Bald and Golden Eagle Protection Act of 1940, as amended; the Forest Service Manual 2600; the National Forest Management Act of 1976, as amended, and its 1982 implementing regulations for Management Indicator Species; the Migratory Bird Treaty Act of 1918 (as amended), Executive Order 13186 (migratory birds), the National Environmental Policy Act, 1969.

Bald and Golden Eagle Protection Act (Eagle Act)

The Eagle Act, originally passed in 1940, prohibits the take, possession, sale, purchase, barter, offer to sell, purchase, or barter, transport, export, or import, of any bald or golden eagle, alive or dead, including any part, nest, or egg, unless allowed by permit (16 U.S.C 668(a); 50 CFR 22). "Take" is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb" a bald or golden eagle. The term "disturb" under the Eagle Act means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

Departmental Regulation 9500-004 (April 28, 2008)

This regulation states the policies of the U.S. Department of Agriculture with respect to management of fish and wildlife and their habitats. The values of wildlife and fish are recognized and enhanced as the Department carries out its overall missions.

Goals are to improve fish and wildlife habitats and to ensure the presence of diverse, native and desired nonnative populations of wildlife, fish, and plants. On lands administered by the Department, alternatives that maintain or enhance fish and wildlife habitat should be promoted. The rights of individual States to manage fish and wildlife populations is recognized, and Departmental agencies are encouraged to assist the States and other Federal agencies in conducting resource inventories and to evaluate the status and potential of fish and wildlife habitat.

Activities and programs will be conducted to assist in the identification and recovery of threatened and endangered species and to avoid actions which may cause a species to become threatened or endangered.

Endangered Species Act (ESA)

The Endangered Species Act of 1973, as amended, provides that all Federal agencies utilize their authorities to carry out programs for the conservation of listed species. It prohibits any Federal agency from carrying out any action that is likely to jeopardize the continued existence of any listed species. It further requires federal agencies to consult with the Fish and Wildlife Service (FWS) on actions that are authorized, funded, or carried out by such agencies that may affect listed species and/or their designated critical habitat. The Act mandates conference with the Secretary of the Interior whenever an action is likely to jeopardize the continued existence of any species proposed for listing as threatened or endangered, or whenever an action might result in destruction or adverse modification of critical habitat proposed for listing.

Fish and Wildlife Coordination Act

The purpose of this Act is to provide that wildlife conservation receives equal consideration and be coordinated with other features of water-resource development programs. Federal agencies are required to consult with the U.S. Fish and Wildlife Service and the head of the State agency prior to proposing or authorizing the impoundment, diversion, or other modifications or control of any water body.

Forest Service Manual (FSM) 2600

FSM 2600 is a primary policy document that guides management of wildlife, fish, and rare plants on Forest Service lands. Six chapters provide guidance for (1) Cooperative Relations, (2) Habitat Planning and Evaluation, (3) Management of Wildlife and Fish, (4) Stocking and Harvesting, (5), Animal Damage Management, and (6) Threatened, Endangered, and Sensitive Plants and Animals.

Manual direction calls for establishing objectives for federal candidate species, in cooperation with the U.S. Fish and Wildlife Service and Arizona State (FSM 2670.32).

Migratory Bird Treaty Act (MBTA) and Executive Order (EO) 13186

Executive Order 13186 (January 10, 2001) requires federal agencies to consider management impacts to migratory birds to further the purposes of the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and other laws. Federal agencies need to identify whether unintentional take will occur, and if so, whether such take would have a measurable negative effect on migratory bird populations. Take is defined to mean "... to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12). Removal or destruction of vegetation is not considered a taking.

Multiple-use Sustained-yield Act of 1960 (as amended through December 31, 1996)

The establishment and administration of national forests is for outdoor recreation, range, timber, watershed, and wildlife and fish purposes. State jurisdiction and responsibilities are not affected.

National Environmental Policy Act of 1969 (as amended through September 13, 1982)

Requires use of an interdisciplinary approach in planning and decision making and requires a detailed statement of environmental impacts for major Federal actions. Agencies shall initiate and use ecological information for planning and development of resource-oriented projects.

National Forest Management Act and 1982 Regulations for Management Indicator Species (MIS)

Management Indicators are: “Plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent” (FSM 2620.5). A forest-wide assessment titled *Management Indicator Species Status Report for the Coconino National Forest* (USDA Forest Service 2013a) summarizes current knowledge of population and habitat trends for management indicator species on the Coconino National Forest.

Methodology and Analysis Process

Whenever possible, species-specific habitat and locality data were used. Additionally, using species-habitat relationships, data were queried by Potential Natural Vegetation Type (PNVT) to help with analysis of effects to species’ habitats.

Information from the Ecological Sustainability Report (USDA Forest Service 2009) and the Analysis of the Management Situation (USDA Forest Service 2010a) were used as the foundation for existing conditions, trends, and issues. Discussions with other resource specialists, and information from their draft Specialist’s Reports were also used for analysis.

For each species (or group of species) analyzed, effects of the direction for program areas, Management Areas, and specific plan components that could have positive or negative impacts were evaluated. The primary evaluation criterion for effects was the “adequacy of guidance” for species and their habitats. Individual plan components such as standards and guidelines could have negative effects on species and their habitats when looked at singularly; however, the focus of analysis is to determine if overall guidance – proactive, maintenance, or mitigation – is strong enough and therefore likely to protect or enhance species and their habitats as site-specific projects are designed and implemented.

Assumptions

In the analysis for this resource, the following assumptions have been made:

- The planning timeframe is 15 years for the purposes of analyses and making determinations of effects.
- For all species and their habitats analyzed one or more individual standards, guidelines, objectives or other plan components in any of the alternatives could have negative effects. The analysis considers the overall guidance and protections that would apply at the project level to avoid or minimize effects.

Description of Affected Environment

There are 40 special status animal species on the Coconino National Forest addressed by this analysis. There are nine federally-listed and candidate species, three Management Indicator Species, 27 migratory birds, and bald and golden eagles. The Mexican spotted owl is analyzed as both a federally-threatened species and as a Management Indicator Species. On July 10, 2013, the US Fish and Wildlife Service published a proposed rule to designate the Northern Mexican Gartersnake (and Narrow-headed Gartersnake) as proposed species (USDI Fish and Wildlife Service 2013). This report excludes Forest Service Sensitive species, fish, aquatic invertebrates, mussels, snails, and plants, as these are addressed in other Specialists' Reports for this project. The following sections supplement information in the DEIS on these 40 species.

Environmental and Cumulative Consequences

Climate Change Common to All Alternatives

In addition to what's in the DEIS, the following information is taken primarily from USFS Southwestern Region May 2010 document titled: *Southwestern Region Climate Change Trends and Forest Planning – A Guide for Addressing Climate Change in Forest Plan Revisions for Southwestern National Forests and National Grasslands* (USDA Forest Service 2010b).

Climate may influence the distribution and abundance of plant and animal species through changes in resource availability, fecundity, and survivorship. The potential ecological implications of climate change trends in the Southwest indicate there will be effects on biodiversity, pressure on wildlife populations, distribution, viability, and migration patterns, because of increasing temperatures, water shortages, and changing ecological conditions; and,

The USFS Southwestern Region includes a high degree of biodiversity and an unusually large number of plant and animal species that are endemic. It is expected that large changes in the structure and species composition of plant communities due to the warming air temperatures and altered hydrological cycles will occur. Many of the region's plant, animal, and insect species depend on precise phenological events based on climatic conditions for migration, flowering, and timing for foraging and reproductive activities. Climate thus influences their distribution and abundance through changes in resource availability, fecundity, and survivorship. It is currently unknown how many species will successfully adapt to changing conditions. The ability of plant and animal species to migrate under climate change will be strongly influenced by their dispersal abilities and by disturbances to the landscape.

Climate change effects to riparian habitats are very important for wildlife in the NFs in the Southwestern Region, as approximately 69% of terrestrial vertebrates inhabit riparian areas at some time during the year. Research predicts that as climate changes, water inputs are expected to decline due to reduced precipitation, consequently reducing water in riparian zones (USDA Forest Service 2010c). Furthermore, observed shifts in the timing of snowmelt along with increases in summer air temperatures have serious implications for the survival of aquatic species. For cool and cold-water species a nearly 50% reduction in thermal habitat is projected with scenarios of increased water temperature. Predicted impacts to aquatic ecosystems include altered seasonal discharge events, increases in drought severity during summer flows, and increasing temperatures in small streams and tributaries that further limit habitat.

Federally-listed Species and Critical Habitat: Endangered, Threatened, Proposed, Candidate

On August 17, 2007, the Forest requested concurrence from the U.S. Fish and Wildlife Service (FWS) on a list of species to address for Forest Plan Revision. In a letter dated August 30, 2007, the FWS concurred with the list and requested that six additional species (not including fish species) be addressed: Gunnison's prairie dog, Mexican gray wolf, northern Mexican gartersnake, narrow-headed gartersnake, northern leopard frog, and bald eagle. The Mexican gray wolf is included in this section, the Gunnison's prairie dog is evaluated through the analysis of the black-footed ferret and in the species viability section of the DEIS. The northern Mexican gartersnake is addressed as a candidate species. The bald eagle is addressed in the bald and golden eagle section under the Bald and Golden Eagle Protection Act. The narrow-headed gartersnake and northern leopard frog are addressed in the viability section of the DEIS.

In 2004, the Southwestern Regional Office (RO) completed a Biological Assessment (BA) for the 11 Forests in the Region (USDA Forest Service 2004a). The FWS issued a Biological Opinion in June 2005 (USDI Fish and Wildlife Service 2005a). Six species were addressed for the Coconino NF: California condor, Chiricahua leopard frog, Mexican spotted owl, Western yellow-billed cuckoo, and Yuma clapper rail. Additionally, the 2004 BA documented a "No Effect" finding for the black-footed ferret. More recently, the Regional Office completed a Biological Assessment (BA) for re-initiation of consultation on National Forests in the Southwestern Region (USDA Forest Service 2011a). This was submitted to the FWS on May 10, 2011. The Biological Opinion (BO) was issued on March 30, 2012 (USDI Fish and Wildlife Service 2012a). The following five species were addressed in detail in the BA: California condor, Chiricahua leopard frog, Mexican spotted owl, Southwestern willow flycatcher, and Yuma clapper rail. The analysis in the DEIS and this supplemental report incorporates the BA for those species by reference for Alternative A – 1987 Plan. See Table 1 for a summary of findings in the 2004 and 2011 Biological Assessments.

Table 1: Federally-listed and candidate species addressed in the 2004 and 2011 Biological Assessments (BA) and 2012 BO for Forest Plans for the Coconino National Forest.

Species	2004 BA Finding	2011 BA Finding	2012 BO
Black-footed Ferret	No Effect	<i>Not addressed</i>	<i>n/a</i>
California Condor	Not Likely to Jeopardize	Not Likely to Jeopardize (XN population); Not Likely to Adversely Affect (fully protected population)	XN: not likely to jeopardize Fully protected: concurred
Chiricahua Leopard Frog	Likely to Adversely Affect	Likely to Adversely Affect	Incidental take assigned and reasonable and prudent measures issued.*
Chiricahua Leopard Frog Proposed Critical Habitat		Likely to Adversely Affect	
Mexican Spotted Owl	Likely to Adversely Affect	Likely to Adversely Affect	Incidental take assigned and reasonable and prudent measures issued.
Mexican Spotted Owl Critical Habitat	Not Likely to Destroy or Adversely Modify (proposed CH); Likely to Adversely Affect (if designated)	Likely to Adversely Affect	
Southwestern Willow Flycatcher	<i>Not addressed</i>	Not Likely to Adversely Affect	Concurred
Southwestern Willow Flycatcher Critical Habitat	<i>Not addressed</i>	Not Likely to Adversely Affect	Concurred, Not likely to destroy or adversely modify
Western yellow-billed Cuckoo	Not Likely to Jeopardize (candidate species); Likely to Adversely Affect (if listed)	<i>Not addressed</i>	<i>n/a</i>
Yuma Clapper Rail	Not Likely to Adversely Affect	Not Likely to Adversely Affect	Concurred

*Between when the BA was submitted to FWS and the final BO was issued, proposed critical habitat became designated critical habitat. The Coconino requested that the conference opinion issued be confirmed as a BO in a letter dated June 1, 2012. The FWS adopted the biological opinion rendered in the conference as a final BO under formal consultation in a letter dated July 17, 2012.

Consequences Common among All Alternatives for All Threatened and Endangered Species

Recovery plans contain guidance that is thought to be necessary to improve the status of listed species and their habitat so that delisting can occur once recovery criteria are met. Using recovery plans in the planning and implementation of Forest activities should result in improved habitat conditions and status of federally-listed species over time. Re-introduction of listed species in cooperation with the Arizona Game and Fish Department (AGFD) is also supported in each alternative. Consequences for implementing recovery plans, giving precedent to federally-listed species, and working with the AGFD on re-introductions would have positive impacts on listed species, and would be the same among all alternatives.

Lands that contain threatened and endangered species habitat is a criterion for acquisition in all alternatives. This can, and has in the past, resulted in the Forest gaining habitat for federally-listed species. For example, habitat for Mexican spotted owl and Little Colorado spinedace was acquired in the East Clear Creek watershed. Even though the wording differs, criteria for land adjustment cases are very similar among all alternatives; therefore, the potential results of the criteria would likely be the same (see DEIS).

Aircraft activities related to commercial filming should be restricted to protect threatened, endangered, and sensitive species from noise disturbance. This reduction in disturbance would apply to the entire Sedona/Oak Planning Area in Alternative A, and forest-wide in Alternatives B, C, and D.

Alternative A Consequences Common for All Threatened and Endangered Species

Desired conditions were articulated as goals in the 1987 Plan (pages 21-27). The primary goals for wildlife and fish are:

- Manage habitat to maintain viable populations of wildlife and fish species and improve habitat for selected species.
- Cooperate with the Arizona Game and Fish Department to at least achieve management goals and objectives specified in the Arizona Wildlife and Fisheries Comprehensive Plans and strategic plans, and on proposals for reintroduction of extirpated species into suitable habitat. No unapproved species are introduced. Support the Arizona Game and Fish Department in meeting its objectives for the state.
- Improve habitat for listed threatened, endangered, or sensitive species of plants and animals and other species as they become threatened or endangered. Work toward recovery and delisting threatened and endangered species.
- Identify and protect areas that contain threatened, endangered, and sensitive species of plants and animals.
- Increase opportunities for wildlife and fish oriented recreation activities.

Additionally, goals for recreation include coordinating with other programs to protect resources and to conserve wildlife habitat provided by caves.

Goals for riparian habitat are to accomplish 80% of riparian recovery by 2030, to improve the remaining 20%, and to cooperate with the AGFD to achieve goals and objectives in the Cold Water Fisheries Strategic Plan.

Goals for noxious weed management are to prevent or control weeds that pose the greatest threat to biological diversity.

Soil, water, and air quality goals are to enhance soil productivity, put all areas in satisfactory watershed condition by 2020, and to protect wetlands and floodplains.

Goals for Research Natural Areas, Botanical Areas, and Geological Areas are to manage for scientific research, baseline studies, and to protect their special qualities. Goals for the Elden Environmental Study Area, in addition to providing educational opportunities, are to maintain the ecosystem.

Goals for timber management, minerals, transportation and administrative facilities, fire protection, and law enforcement program areas mention integration with other resources and/or resource protection.

The only program areas that do not specifically mention goals for integration or resource protection are wilderness, range, and lands.

Collectively, these goals provide clear desired conditions to integrate resource management to protect resources, including threatened and endangered species, to coordinate with the AGFD, to reintroduce extirpated species, and to improve habitat conditions. Striving to achieve goals for riparian, watershed, soil, and water resources will promote improved conditions for all threatened and endangered species.

Standards and guidelines that apply to all threatened and endangered species (non-species specific) where species or habitats are present are:

Recreation

- The following criteria are used to evaluate the need for future [road] closures or [off-road driving] restrictions... Habitat for threatened, endangered, or sensitive species that is threatened. P. 58-59

Wildlife and Fish

- Inventory, evaluate, and prepare recovery schedules for proposed, T&E, and sensitive plant and animal species in the first decade or as species are proposed. Monitor approved schedules, reproductive success, and effects of management activities at occupied threatened, endangered, and sensitive species sites. Reintroduce T&E species in accordance with recovery plans. P. 64
- Evaluate potential resource impacts on T&E and sensitive species habitat by projects and activities through a biological assessment (FSM 2670) and conduct appropriate consultation (FSM 2670) when necessary. Provide appropriate protection or enhancement. P. 65
- Habitat locations for listed plant and animal species remain confidential to prevent unnecessary disturbances or theft. Provide appropriate law enforcement to protect habitat for listed species. P. 65

- Provide appropriate law enforcement to protect habitat for listed species. P. 65
- Give priority to maintaining structures for threatened and endangered species. P. 65-12
- Determine the need for structural improvements and maintain those needed in operable condition or replace. P. 65-12
- Manage forage to increase threatened and endangered species and management indicator species where it is determined appropriate through the IRM and NEPA process. P. 66
- Improve T&E and sensitive species habitat. Improvement projects give priority to recovery of T&E species. Conform to approved recovery plans. P. 66

Range

- Forage use by grazing ungulates will be maintained at or above a condition which assures recovery and continued existence of threatened species. P. 66-1

Insect and Disease Management

- Habitat requirements for threatened, endangered, and sensitive species take precedence over insect and disease control. P. 70

Minerals

- Mineral projects meet NEPA requirements. Future EA'S/ EIS'S from other resource areas receive appropriate input from minerals resource. Surface resource projects and plans which have potential for conflict with the development of the minerals resource, such as wildlife implementation schedules, T&E recovery schedules, viewshed corridor plans, and ROS plans will receive input from a Forest Service mineral resource specialist regarding potential impacts on mineral exploration and development and on ways to avoid unnecessary conflicts between surface and mineral resources. Input will also be solicited from the interested and affected publics including, as appropriate, mining claimants, Arizona Department of Mines and Mineral Resources, Arizona mining and prospecting associations, and leasable energy companies. P. 76
- There will be no surface occupancy where listed endangered species exist, on slopes greater than 40 percent, on areas where the VQO is foreground Retention, on the Montezuma Castle Backdrop Area, or the portion of Deadman Wash basin adjacent to Wupatki National Monument. On a case-by-case basis, minor exceptions, such as a buried pipeline, may be considered provided the overall foreground Retention VQO is met. P. 76 (Minerals Management – Leasable)

Special-Use Management (Nonrecreation)

- New corridors will avoid wildernesses, RNA's, geological and botanical areas, Elden Environmental Study Area, and the ponderosa pine and mixed conifer vegetation types. New corridors will be evaluated for their potential impacts on T&E habitats. P. 79

Fuel Treatment

- Snags and downed logs that are necessary to meet wildlife management objectives for the area are identified and fire lined to protect them. They are also monitored during burning to protect them. T&E and sensitive species are also protected by lining and monitoring. Any unburned islands inside the perimeter of the fire of one-quarter to 2 acres are left unless they are a threat to the management of the fire or prevent achievement of the fuel treatment objectives. P. 95

- Suppress fires that threaten habitat of threatened and endangered, or sensitive species. P. 95

Red Rock/Secret Mountain/Munds Mountain Wilderness

- Designate camp areas in West Fork consistent with protection of threatened, endangered, and sensitive species.

MA 3 – Ponderosa Pine and Mixed Conifer, Less than 40% Slopes

- Silvicultural prescriptions emphasize treating dwarf mistletoe infections to bring them down to acceptable levels, unless threatened, endangered, or sensitive species habitat requirements take precedence. Pg. 122-1
- Priorities for use of K-V funds will be...Correct serious problems that have been identified such as erosion that needs to be stopped to preserve soils, needed T&E habitat improvement, and treatment of dwarf mistletoe infected stands. P. 136

Sedona/Oak Creek Area Wide

- Natural elements of the landscape are restored and protected. Threatened, endangered and sensitive species are recovering. Appropriate actions are taken to minimize impacts to these species. P. 206-09 (Goal)
- Guidelines P. 206-12 to 13
 - In general, the following guidelines (1 through 8) should be applied to threatened, endangered and sensitive species. If analysis or new information suggests a modification of these guidelines is needed, consultation with the US Fish and Wildlife Service (USFWS) must occur.
 - Communicate and cooperate with the USFWS and the Arizona Game & Fish Department (AG&FD) on efforts related to all threatened and endangered species.
 - Maintain riparian pasture and riparian enclosure fences to prevent livestock trespass, which can result in the degradation of threatened, endangered and sensitive species habitat...
 - Personnel conducting inventory or monitoring for threatened, endangered or sensitive species must obtain permits and attend inventory and monitoring training prior to conducting these activities.
 - Compile, map in GIS and file in an electronic corporate database information obtained from threatened, endangered or sensitive species site visits, inventory and monitoring efforts.

Flagstaff/Lake Mary Ecosystem Analysis (FLEA) Area-wide

- Use-level allocations will range from no allocation within some Primitive and Semi-primitive Non-motorized ROS areas to relatively high use allocations within some Roded Natural areas. Other more site-specific resource concerns, such as the presence of significant archeological sites, threatened, endangered, or sensitive wildlife habitat, and areas with sensitive soils, will also influence outfitter/guide allocations. P. 206-65 (Guideline)
- Inform and enforce State regulations for no camping within ¼ mile of open water. Other more site-specific resource concerns, such as the presence of significant archeological

- sites, threatened, endangered, or sensitive wildlife habitat, and areas with sensitive soils, will also influence group use allocations. P. 206-66 (Guideline)
- Complete a management plan specific to rock climbing to tier from the *Forest Plan*. Climbing policy in the *Forest Plan* may be amended if the development of the climbing plan demonstrates the need. The climbing plan will include, but is not limited to...Closure measures when needed for threatened, endangered, and sensitive (TE&S) plants and animals and cultural resources... p. 206-67 (Guideline)
 - Inventory rock climbing areas to determine their resources, conditions, and significance. Upon evaluation, some other sites may receive short-term, long-term, or seasonal closures to climbing to limit disturbance to threatened, endangered, or sensitive species. Restrictions will be used on a case-by-case basis as determined necessary by wildlife biologists in consultation with U.S. Fish and Wildlife Service where appropriate. P. 206-67 (Guideline)
 - Reasons for [road] closure or obliteration may include, but are not limited to, one or more of the following criteria... Habitat for threatened, endangered, or sensitive species that is threatened... p. 206-71 (Guideline)
 - Threatened, endangered, sensitive, and management indicator species are maintained or recovering in the majority of the habitat. P. 206-72 (Goals and Objectives)
 - Seek opportunities to add to our base of knowledge about human disturbance to T&E species. This could be a variety of methods that could include but are not limited to, monitoring, survey of habitat, survey of recreation uses, or trail counters. Consider options to gather information when planning, or implementing, or monitoring site-specific projects, or approving special uses or outfitter guides. Consider partnership opportunities with organizations or agencies to gather information outside of site-specific project planning. A variety of methods could be used to gather information including, but not limited to: monitoring, survey of habitat, survey of recreation uses, or trail counters. Share results and data among resource personnel and line officers for consideration in future projects with wildlife biologists and recreation staff to incorporate lessons learned into the next project. If analysis shows a need, management changes that could include, but are not limited to, relocating roads or trails, limiting season of use, designating types of activities, or reducing numbers of users could result if analysis shows a need. Pp. 206-73 to 74 (Guideline)

Alternative B, C, and D Consequences Common for All Threatened and Endangered Species

There is guidance in these alternatives that addresses wildlife and their habitats, but guidance that specifically addresses threatened and endangered species is as follows:

Biophysical Features

- Several rock climbing areas on the Forest are nationally and internationally known. Rock climbing and related recreational activities offer challenges for rock climbers, but they do not diminish the quantity or quality of specialized vegetation, such as lichens and rare plants, nor do these activities disrupt life processes of rare or threatened species. (Desired Conditions)

Vegetation – All Riparian

- The table below is intended to be a general starting point for determining the width of the streamside management zone, based on average cover conditions and erosion hazard. Other considerations for the size and shape of a streamside management zone include soil type¹, orientation of stream or river to the sun, connection of stream to impaired waters, presence of threatened or endangered species, and condition of the riparian area. (Guideline)

Wildlife, Fish, and Botany

- Habitats for special status species support viable, self-sustaining populations. Ecological conditions provide habitat for federally-listed and other special status species. Habitat conditions contribute to the survival and recovery of listed species, allow for repatriation of extirpated species, contribute to the de-listing of species under the Endangered Species Act, preclude the need for listing new species, improve conditions for Southwestern Region sensitive species, and keep common native species common. (Desired Conditions)
- During each 10-year period during the life of the Plan, implement actions for 20 to 50 federally-listed species that contribute to recovery or implement recovery plan actions. (Objective)
- Follow recovery plans from the U.S. Fish and Wildlife Service for federally listed species, and use best available information for the management of federally listed species that do not have recovery plans. (Standard)
- Direction for species listed as threatened, endangered, proposed, or candidate takes precedence over direction for species not listed by the U.S. Fish and Wildlife Service. (Standard)
- Comply with species conservation agreements, assessments, and strategies developed to improve the status of species with the goal to prevent the need for Federal listing. (Standard)
- Project specific wildlife concerns may require modifying the standard specifications on new or existing fences. Construction of additional fences should be minimal. Maintenance of fences should occur as needed and be prioritized in threatened, endangered, and sensitive species habitat and in habitat for fence-sensitive big game species. Fences that are no longer needed should be removed. (Guideline)
- Seasonal timing restrictions should be applied for threatened, endangered, and sensitive species and Golden eagles to protect known nests, roosts, spawning habitat, and other special features from habitat alteration and/or disturbance from management activities to avoid disruption of species or their habitats that could affect survival or successful reproduction. (Guideline)
- Conservation and recovery of threatened, endangered, and sensitive plant species should be emphasized where quantity and quality of habitat needed to support them is a concern. (Guideline)

¹ Soil type or hydrologic soil group.

Livestock Grazing

- Nonstructural and structural (e.g., fences, troughs, pipelines) range improvements should be used and/or located in a way that does not conflict with riparian functions, rare species, and archaeological sites and should be relocated or modified when found incompatible.

Energy and Minerals

- To protect social, cultural and ecological values, the following areas should be considered for No Surface Occupancy, No Leasing, or other leasing stipulations for leasable minerals in...Areas with a high density of threatened, endangered or sensitive species (Forestwide Guidelines for Energy and Minerals)

Roads and Facilities

- A sustainable, and economical transportation system (roads) expands and contracts commensurate with use and needs, and balances the desire for public access with potential for ecological impacts. A system of sustainable, well-maintained, and marked roads provides diverse opportunities to safely explore the Forest and minimizes impact to watershed conditions, rare plants, fisheries, and wildlife habitat and movement. Permanent and temporary roads systems minimize stream crossings. Bridges and culverts allow for safe passage for aquatic organisms. Travel restrictions are clearly understood by Forest visitors. Roads to private property provide reasonable access but do not necessarily provide for comfort or all-weather access. Roads that are under easement or special use permit are maintained to Forest Service standards by the permittee or easement holder. Temporary roads that support ecosystem restoration activities, fuels management or other short-term projects are rehabilitated promptly after project completion. Unneeded roads are closed and naturalized² to reduce human disturbance to wildlife and to reduce soil erosion. Some closed roads are converted to motorized trails or non-motorized trails for recreational use. (Desired Conditions)
- To minimize disturbance to wildlife, road maintenance activities should avoid, where possible, or minimize noise disturbance where disturbance-sensitive threatened and endangered species are present. Existing roads should be used or realigned for this purpose. (Guidelines for Roads and Facilities)
- To maintain an efficient and sustainable road system, unneeded roads should be decommissioned. Factors in prioritizing the naturalization of decommissioned and unauthorized roads should include the following...Habitats for threatened, endangered, or sensitive species that are susceptible to roads as barriers or roads as mortality hazards (Guidelines for Roads and Facilities)

Land Adjustments

- To better promote the mission of the agency, lands that the Forest considers for acquisition should have one or more of the following qualities... Contains habitat for threatened or endangered species and sensitive species.

² Naturalization may include decommissioning or obliterating system roads or rehabilitating user-created roads and trails.

Special Uses

- Aircraft activities related to commercial filming should be restricted to protect threatened, endangered, and sensitive species from noise disturbance. (Guideline)

Overall, all alternatives consider threatened and endangered species and have guidance to support protection and recovery. In Alternative A, guidance that is not reflected in Alternatives B, C, and D includes numbers 9-13, 15-17, 19-24, 26-29, and 33 above. Some of the more important guidance that is not in Alternatives B, C and D includes:

- keeping threatened and endangered species location confidential and providing law enforcement to protect habitat;
- managing forage to maintain or increase habitat for listed species;
- managing fuels such that listed species, snags and downed logs are protected and monitored, and suppressing fires that threaten listed species habitat;
- maintaining habitat for listed species takes precedence over insect, disease, and mistletoe treatments;
- maintaining exclosures to prevent livestock trespass into listed species' habitat in the Sedona/Oak Creek Area;
- requiring that personnel conducting inventory or monitoring be trained and have permits in the Sedona/Oak Creek Area; and,
- outfitter-guide and group use allocations will be influenced by the presence of listed species in the FLEA area.

In Alternatives B, C, and D, guidance that is not reflected in Alternative A includes numbers 2, 4, 8, 9, 11, and 13-15. Some of the more important guidance that is not in Alternative A includes:

- considering the presence of listed species when determining the width of streamside management zones;
- implementing 20-50 recovery actions for listed species;
- modifying fence standards at the project level, constructing minimal additional fences, and prioritizing maintenance of fences in listed species habitat;
- apply seasonal timing restriction for listed species;
- locate range improvements so they don't conflict with rare species; and
- manage roads and facilities to minimize impacts to rare species' habitats, minimize noise disturbance to listed species during road maintenance activities, and factor in roads that are barriers or mortality hazards for listed species in the prioritization of naturalizing and decommissioning roads.

1. Black-footed Ferret

Existing Condition/Affected Environment

There are no known existing black-footed ferrets on the Coconino National Forest. There is one historic location of black-footed ferrets that was reported to come from 12 miles west of Winona, which would make it very close to Flagstaff (Cockrum 1960) and therefore within the boundaries

of the Forest. There are also historic records from 7 miles NE of Williams and in Government Prairie near Parks, Arizona (Cockrum 1960), both of which are fairly close to the boundary of the Forest. There have been no comprehensive surveys for black-footed ferrets on the Forest.

Black-footed ferrets require prairie dogs to survive. The historical range of the black-footed ferret is nearly identical to that of three prairie dog species: the black-tailed prairie dog (*Cynomys ludovicianus*), the Gunnison's prairie dog (*C. gunnisoni*), and the white-tailed prairie dog (*C. leucurus*). Gunnison's prairie dogs are the species found on the Coconino National Forest. Ferrets occupy the burrows made by prairie dogs and utilize prairie dogs as a main source of food.

Prairie dogs are semi-fossorial animals that need well drained, deep soils to dig their burrows (Wagner and Drickamer 2003 in Underwood 2007). Because they live in arid, nutrient limiting environments, both the quantity and quality of vegetation is important for survival and reproduction, but the total groundcover within colonies documented in several studies ranged from 39-74 percent (Underwood 2007).

Ruffner (1980) visited and described 11 Gunnison's prairie dog colonies on the Coconino. These colonies were on the Peaks and Mormon Lake Ranger Districts, and varied in size from 8 - 306 acres, with a mean of approximately 84.6 acres (Ruffner 1980). Twenty-four additional colonies were identified within the Forest boundary, but were abandoned, not on Forest Service lands, not located, or not visited (Ruffner 1980). Most of these colonies were within or nearby Flagstaff's city limits.

Hoffmeister (1986) provided historical reports from the early 1900's of high population numbers of Gunnison's prairie dogs, especially between Flagstaff and Seligman, Arizona. However, their numbers became greatly reduced until the 1960's (Hoffmeister 1986). One notable story reports that 1641 prairie dogs were poisoned in one night alone on 320 acres on the Coconino in 1917 (Howell 1960, as reported by Hoffmeister 1986).

Gunnison's prairie dogs and black-footed ferrets are primarily associated with the Great Basin Grassland, Montane Subalpine Grassland, and Pinyon Juniper with Grass PNVTs on the Forest. The acreage of known prairie dog towns is 2,574 acres in Great Basin Grassland, 1,071 acres in Montane Subalpine Grassland, and 3,103 acres in Pinyon Juniper with Grass.

Cumulative Consequences Common to All Alternatives

Wupatki National Monument occurs adjacent to the Forest at the very north and eastern boundary. The General Management Plan (GMP) defines the direction for resource preservation and visitor use at the Monument (USDI National Park Service 2002). Although prairie dogs and ferrets are not specifically addressed, the Monument contains grassland habitats that abut Great Basin grassland on the Forest. There would be a small amount of grassland habitat impacted by construction of a new visitor orientation station and expansion of the Citadel-Lomaki visitor area. Additionally, construction of a ½ mile trail into the grassland ecosystem near Lomaki ruin would impact habitat and increase disturbance. Overall though, 93-97% of Monument lands (Overby 2011, personal communication, Paul Whitefield) are within the Resource Preservation Zone, where unauthorized access is prohibited (USDI National Park Service 2002) providing habitat protection and reduced disturbance to wildlife. Guidance under the GMP would result in positive

cumulative impacts by protecting the majority of grassland habitat in the Monument, providing connectivity to adjacent grasslands on the Forest.

There is some Great Basin and Montane/subalpine grassland habitat adjacent to the Coconino National Forest's northwestern boundary, and two relatively large grasslands, Garland and Government Prairies, are nearby. Guidance in the Kaibab's revised Forest Plan would add cumulatively to Coconino's Forest Plan direction. Because the Kaibab's plan would focus on restoration of vegetation towards historical reference conditions, cumulative effects would add positively to effects from Plan direction on grassland habitats.

The Arizona Game and Fish Department led the development of an interagency management plan for Gunnison's prairie dogs (GPD) in Arizona (Underwood 2007). The purpose of the plan is to identify and implement management strategies in Arizona that will contribute to range-wide GPD conservation. As both the black-footed ferret and the burrowing owl depend on prairie dog burrows for their primary habitat, and because ferrets also depend on prairie dogs as food, the objectives of this plan will either directly or indirectly beneficially affect both black-footed ferrets and burrowing owls.

State and private land grassland habitat occurs adjacent to the Forest primarily on the north and east borders. Activities on these lands can have cumulative impacts to habitat. The primary known activity on these lands is livestock grazing. Poorly managed livestock grazing can have negative effects on prairie dogs, but well managed grazing has been found to benefit black-tailed prairie dogs (Underwood 2007).

Shooting of prairie dogs is authorized under a hunting license from the Arizona Game and Fish Department (AGFD). Data from 2000-2006 show that 30,000 to 94,000 Gunnison's prairie dogs are taken each year (Underwood 2007). Peak shooting pressure occurs in May and June when lactating females and young of the year are more vulnerable and can result in reduced yearly reproductive output (Underwood 2007). AGFD has instituted seasonal shooting closures from April 1 to June 15 to protect pregnant and lactating prairie dogs and their young (Underwood 2007).

Alternative A – 1987 Plan

Environmental consequences

Grassland habitat that supports prairie dog habitat within the 1987 Plan is described within Management Area (MA) 9 – Mountain Grassland (1,662 acres) and MA 10 – Grassland and Sparse Pinyon Juniper Above the Rim (144,275 acres). See pages 158-165 in the 1987 Plan for forest plan direction for MA 9 and 10. The management emphasis in these MAs is on livestock grazing, visual quality, and wildlife habitat.

In addition to consequences described in the DEIS, standards and guidelines (S&G) call for maintaining and improving mountain meadows and grasslands for wildlife habitat using a variety of nonstructural (e.g. removing competing conifers, gully stabilization, reseeding, control of undesirable plant species, prescribed burning) and structural (e.g. fencing to protect key meadows, piping water) improvements. Range management direction is to improve unsatisfactory range conditions and to maintain seral grasslands where type conversions have occurred in the past. Standards and guidelines for range direct that weed treatments are to be

integrated into projects. Prescribed fire is used to accomplish resource objectives outside of the urban interface. Fire suppression objectives are 10 acres or less in the urban interface, and 1,000 acres or less outside of the urban interface.

Implementation of these S&Gs that support re-introductions and improve grasslands habitats are beneficial for ferrets and habitat for prairie dogs, their primary food source. However, even with strong guidance in the 1987 Plan, the current condition for fire regime and soil condition in Great Basin and Montane/Subalpine grassland is highly departed from the historic conditions (see DEIS).

Standards and guidelines for minerals ensure that project analysis will receive input on potential impacts and ways to avoid conflicts with threatened and endangered species. A specific standard and guideline states that there will be no surface occupancy for minerals where listed endangered species exist. These S&Gs ensure that black-footed ferrets would be protected from mineral development at the project level.

Criteria for consideration of closures or restrictions includes habitat for threatened, endangered, and sensitive species, key wildlife areas that are being damaged, and areas important for wildlife reproduction. Recreation special use authorizations are administered to protect resources.

Alternative B – Modified Proposed Plan

Environmental consequences

Vegetation/PNVTs

The desired condition for Great Basin and Montane/Subalpine grassland PNVTs describes a landscape that provides good habitat for prairie dogs, and therefore, black-footed ferrets. The goal is to have native vegetation in a mix of age classes with the height, density, and cover of plants that supports historic fire return intervals. Canopy cover of trees and shrubs is less than 10%. Soil erosion is minimal, and long-term soil productivity is maintained. The desired condition describes connectivity among grasslands. Surface drainages and subsurface flow patterns of water are maintained to return water flow into connected water bodies and streams. The desired condition includes a description of a mosaic of vegetation, ranging from densely vegetation, to bare areas that result from natural activities, such as prairie dog burrowing.

Desired conditions for Pinyon Juniper grasslands also describe a landscape that provided good habitat for prairie dogs. Canopy cover is 10-30%, providing a native herbaceous understory that provides food and cover for wildlife and can support frequent surface fires.

One of the guidelines for Great Basin and Montane/Subalpine grassland PNVTs that will contribute to maintenance of habitat calls for retaining 90 percent of potential ground cover. Guidelines for pinyon juniper grasslands describe the intent to maintain seral grasslands as grasslands, rather than enhancing successional states and call for improvement in soil and watershed conditions and herbaceous vegetation growth.

While not tied specifically to grassland PNVTs, other objectives that call for soil and watershed improvements, naturalizing and decommissioning roads, implementation of actions to benefit federally-listed species, and restoration of terrestrial wildlife habitat could contribute to meeting desired conditions for prairie dog and ferret habitat.

Aquatic Resources – Watersheds

Desired conditions for watersheds support conditions that would provide good habitat for prairie dogs and ferrets. Biological processes are functioning, watersheds have good groundcover and are resilient to disturbances, soil productivity is maintained, and they provide habitat that supports adaptive plant and animal communities.

Guidelines for watershed management include prioritization of treatments on priority 6th code watersheds and to protect life and property, but these do not relate directly to Gunnison prairie dog habitat.

The objective to restore 5-6 priority watersheds that are in impaired or functioning-at-risk condition within 10 years after plan approval could benefit prairie dogs if priority watersheds contain grassland habitats.

Soils

Desired conditions for soils support conditions that would maintain or improve soil conditions within the Great Basin, Montane/Subalpine grasslands, and Pinyon Juniper with Grass PNVTs. Hydrologic function (infiltration and dispersion), soil stability to withstand erosion, and nutrient cycling will be maintained.

Guidelines to implement and monitor best management practices and to use Terrestrial Ecosystem Survey data for project design will contribute to improving soil condition.

Wildlife, Fish, and Botanical Resources

Desired conditions for wildlife emphasize thriving native populations and habitat conditions that allow for successful repatriation of extirpated species, as well as contributing to the survival and recovery of listed species once repatriated.

If black-footed ferrets are discovered or re-introduced, the guideline to apply seasonal restrictions if needed to protect species or habitats from disturbance could be applied to ferret sites.

Invasive Species Management

There are no standards, guidelines, or objectives relative to invasive species management for Great Basin and Montane/Subalpine Grasslands, but forestwide desired conditions and guidelines for invasive exotic species emphasize prevention, control and/or eradication.

These desired conditions would guide project level planning and on-the-ground management, and provide emphasis on preventing or reducing invasive species that can impact native grasslands, supporting higher quality habitat for prairie dogs and ferrets. The direction in this Alternative is nearly identical to that in Alternative A, so the effects are similar.

Infrastructure (Roads and Facilities)

This alternative has strong guidance to minimize impacts from roads, and to a lesser degree, from facilities, wildlife through its desired conditions and guidelines. Endangered species habitat is a factor for prioritizing decommissioning of unneeded roads, and disturbance from road maintenance will be avoided or minimized. Forest-wide desired conditions for facilities are to avoid or minimize impacts to natural resources. Additionally, the objective for roads calls for naturalizing or decommissioning 200-800 miles of roads within 10 years, some of which could be within prairie dog/black-footed ferret habitat. This guidance supports lessening impacts and improving habitat through road decommissioning that will also result in less disturbance and

mortality from vehicles on prairie dogs. Compared to Alternative A, this alternative provides more protective guidance with respect to infrastructure management.

Lands

See consequences common to all.

Livestock Grazing

Desired conditions emphasize the preservation of open space that sustains biological diversity and ecological processes, maintaining the desired composition and structure of plant communities. Grazed areas have stable soils and functional hydrology.

Guidelines that would help maintain or improve prairie dog and potential ferret habitat are: (1) give sufficient rest after burning or mechanical treatment to ensure plant recovery, and (2) manage the intensity, timing, duration, distribution, and frequency of livestock grazing to provide for growth, reproduction, and retention of adequate residual cover of desired plant species.

Although they are not very specific to grassland or prairie dog habitat, these desired conditions and guidelines give some emphasis on maintaining diverse habitats that will positively influence grasslands and prairie dog habitat when applied at the project level.

Compared to Alternative A, this alternative provides similar guidance for range. Alternative B is more descriptive regarding biological diversity, but Alternative A calls for improvement in unsatisfactory range conditions.

Energy and Minerals

This alternative has desired conditions to provide opportunities for environmentally sound minerals development, while protecting important wildlife habitats. One guideline calls for considering withdrawing certain areas from development of locatable minerals for species that have a very limited range and specific habitat requirements not found elsewhere (FW-EngyMin-G1). Another guideline is to consider areas with threatened, endangered, or sensitive species for no surface occupancy (FW-EngyMin-G-3). These desired conditions and guidelines will protect ferrets if found on the forest. The guidance is similar to that found in Alternative A, so the effects will not differ.

Recreation

Desired conditions for recreation are to provide programs, infrastructure, and services that are useable by all people to the greatest extent possible. Uses at developed sites don't cause damage to ecologically sensitive areas. Disbursed recreation does not significantly impact wildlife. Resource damage from unauthorized motorized trails is minimal, and motorized trails are located with minimal impacts to wildlife resources. Camping and trails are managed to avoid resource damage.

Objectives are to develop 2-8 systems of designated bike, equestrian, and/or motorized trails within 5-10 years of plan approval.

Standards prohibit motorized vehicle use beyond the designated system of roads, trails, and areas.

While plan components for forestwide recreation do not specify protection or mitigation for prairie dogs and ferrets, direction generally requires consideration of recreation impacts on natural resources. This will allow site-specific consideration of prairie dog and ferret habitat needs at the project level.

Recreation Opportunity Spectrum

The forest plan sets the desired ROS (also called ROS objectives) that are used to determine if projects are compatible with Forest recreation goals. At the project-level, the desired ROS is used to determine if a project is moving toward or away from the desired ROS. ROS classes represent a continuum or spectrum from primitive and unmodified environments to highly urban and modified landscapes. The more primitive classes include Primitive (P), Semi-Primitive Non-Motorized (SPNM), and Semi-Primitive Motorized (SPM) and are characterized by relatively little or no developments and roads. The less primitive classes are Roaded Natural (RN), Rural (R), and Urban (U).

Alternative B shifts about 11,152 acres from less primitive to more primitive for GBG and MSG, and shifts 10,107 from more primitive to less primitive for PJG. There is an overall shift of 1,045 acres in more primitive ROS classes in alt B compared to alt A. Therefore, there will be a negligible difference (about 0.2% of potential habitat) overall to ferret habitat from the ROS objectives for alternative B.

Table 2. Acres by ROS class within Black-footed ferret habitat by alternative.

PNVT*	Alternative	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
GBG	A	190	1,786	62,836	64,812	28,067	34	0	0	92,913
	B	2517	8,074	64,381	74,972	17,922	18	0	0	92,912
	C	2520	22,062	50,718	75,300	17,595	18	0	0	92,913
	D	190	8,074	66,709	74,973	17,922	18	0	0	92,913
MSG	A	628	497	5765	6,890	15,917	513	0	109	23,429
	B	628	799	6455	7,882	14,767	766	13	0	23,428
	C	634	1723	5632	7,989	14675	752	13	0	23,429
	D	628	799	6455	7,882	14767	766	13	0	23,428
PJG	A	4,187	11,389	164624	180,200	81,209	0	0	12	261,421
	B	7832	19,910	142351	170,093	91,298	5	25	0	261,421
	C	7945	38,084	124390	170,419	90,972	5	25	0	261,421
	D	4184	19,910	145999	170,093	91,298	5	25	0	261,421

* GBG = Great Basin Grassland, MSG = Montane Subalpine Grassland, and PJG = Pinyon Juniper Grassland

**Includes WOS for Alts. B, C, D.

Alternative C

Environmental consequences

Alternative C is the same as Alternative B, except for seven elements described below.

1. Thirteen proposed wilderness areas: see DEIS.
2. Designation of 8 WHMAs: Overall, standards and guidelines for WHMAs will reduce disturbance from recreation and motorized vehicles compared to Alternative A or B. This can positively impact prairie dogs and their habitats by reducing grassland vegetation impacts from livestock grazing, and disturbance to prairie dogs from recreational and motorized uses of the area.
3. Expanding the Cottonwood Basin Geological Fumaroles Area would have no impact since it is outside of the range of black-footed ferrets.
4. Walnut Canyon, Sedona-Oak Creek, Long Valley, and Flagstaff Neighborwoods Management Areas contain some grassland habitat. Elimination of recreational shooting would have minor positive impacts on prairie dogs by reducing noise disturbance.
5. Disallowing snowmobile use in the Walnut Canyon Management Area would not impact prairie dogs, since they hibernate during the coldest, snowiest months.
6. None of the Research Natural Areas contain grasslands, so restricting grazing until grazing supports, or would not affect, the research purposes of RNAs will have no impacts.
7. Retaining the old growth standards and guidelines from the 1987 Forest Plan will have no impacts on prairie dogs and their grassland habitats.

Recreation Opportunity Spectrum

Alternative C shifts about 11,587 acres from less primitive to more primitive for GBG and MSG, and shifts 9781 acres from more primitive to less primitive for PJG. There is an overall shift of 1806 acres in more primitive ROS classes in alt C compared to alt A. Therefore, there will be a negligible difference (about 0.5% of potential habitat) overall to ferret habitat from the ROS objectives for alternative C.

Determination of Consequences

Alternative C would be much more beneficial compared to Alternatives A and B by designating Anderson Mesa WHMA that contains almost 192,000 of grasslands that will have an emphasis on restoration to benefit wildlife.

2. California Condor

Existing Condition/Affected Environment

The California condor is a long-lived species with low reproductive rates, laying one egg every other year or two. Condors nest in various types of rock formations including crevices, overhung ledges, potholes, caves, or in tree cavities. In Arizona, condors nest and roost in steep terrain with cliffs, ledges, and caves. Cliffs, tall conifers, and snags are generally used as roost sites, which also provide strong updrafts required for lift into flight. Condors are opportunistic foragers,

feeding only on carcasses. Most condors forage in open terrain, and can travel 100 miles or more per day.

The last known sighting of a wild condor in Arizona was near Williams in 1924 (Phillips et. al 1964). The last wild condor was captured in 1987.

An experimental population area was designated to accommodate future movements and expansions of reintroduced condors (USDI Fish and Wildlife Service 1996). The designated experimental population area is located in Arizona, Utah, and Nevada, and is bounded by Interstate 40 to the south, Highway 93 and Highway 15 to the west, Highway 70 to the north, and Highway 191 to the east (USDI Fish and Wildlife Service 1996). Therefore, the Coconino National Forest north of I-40 is within the designated experimental population area. So far, there have only been a couple of reports of condors on the Coconino National Forest. Several years ago, one was reported north of Flagstaff, and another condor roosted one night near Sedona, Arizona as it made a large loop back north (Overby 2008). Any condors outside of the experimental population area are fully protected as endangered.

Cumulative Consequences Common to All Alternatives

The primary threat to condors is ingestion of lead shot. The Arizona Game and Fish Department has a voluntary lead shot program, along with its partners the Arizona Deer Association, Arizona Elk Society, Arizona Antelope Foundation, Arizona Desert Bighorn Sheep Society, and the Arizona Chapter of the National Wild Turkey Federation. Their message to hunters is to “be part of the solution by using non-lead ammunition when hunting in condor country” which they identify as Game Management Units 9, 10, 12A/B, and 13A/B (none of these are on the Forest).

3. Chiricahua Leopard Frog and Proposed Critical Habitat

Existing Condition/Affected Environment

Chiricahua leopard frogs (CLF) are habitat generalists, breeding in slack waters in a variety of natural and man-made aquatic systems. Habitat heterogeneity is thought to be important in providing habitat for the frog’s different life stages and seasonal requirements. Their elevational range is from 3,281 to 8,890 ft but occur (recently and presently) between 5,020 and 5,780 ft. On the Coconino National Forest, Chiricahua leopard frogs are currently only known to occur in earthen livestock tanks that hold water year round. These tanks are within ephemeral drainages that eventually drain into Fossil Creek and the Verde River. Populations in earthen tanks have not been persistent when introduced nonnative fish and crayfish were present.

Leopard frog and other herpetofauna surveys have been conducted on the Forest since the early 1990’s. Most surveys have been conducted by the Arizona Game and Fish Department (AGFD) and results have been documented in several reports (Sredl and Howland 1992, Sredl et. al 1993, Sredl et al 1995, Windes et al 1997). Sredl et al (1997) summarized the results of statewide surveys for Arizona native ranid frogs, including the Chiricahua leopard frog, to describe their current status and distribution. Surveys since 1998 have been conducted by agency biologists from AGFD, USFWS and USFS.

Occupied Chiricahua leopard frog sites have been located through ongoing surveys by agency biologists from 1997 to the present. The only extant populations of CLF on the Forest occur in the southern part of the Forest, in an area known as Buckskin Hills/Mud Tanks. Records exist from other locations along the Mogollon Rim, including East Clear Creek and West Clear Creek drainages, but these sites have been unoccupied since at least the mid-1980's.

Chiricahua leopard frogs are known to have occurred at several dozen locations on the Coconino National Forest. The recently and currently occupied sites known on the Forest are stock tanks and occur in the Buckskin Hills/Mud Tanks area both north and south of Hwy 260. Historic sites expand from the Buckskin Hills north to Buck Mountain and east over to Leonard Canyon.

The extent of the population on the Forest wasn't realized until intensive surveys began in the late 1990's and early 2000's. In 2001, Chiricahua leopard frogs were the most wide-spread, occupying 9 sites. After the drought of 2002, frogs were only documented to occur at two sites, Sycamore Basin and Walt's, both of which are on the Red Rock Ranger District. Since 2002, there's been a respite from drought as well as some habitat and protection improvement projects completed. However, since 2007, surveys of Sycamore Basin and Walts have been negative.

The DEIS contains the summary of current vegetation and soil departures from historical conditions and current trends for the riparian forest, and wetland PNVTs that provide Chiricahua leopard frog habitat, as well as for pinyon-juniper upland habitat that surrounds occupied sites.

All historical and current CLF sites are within Recovery Unit 5 (U.S. Fish and Wildlife Service 2007). Within recovery units, Management Areas (MAs) have been delineated around extant populations and high potential recovery sites and are based on watershed boundaries. On the Forest, there are two MAs delineated. The West Mogollon MA includes currently occupied sites and proposed critical habitat in the Buckskin Hills area. The East Clear MA includes historically occupied habitat, but CLF do no longer occur there. It has the potential to support a metapopulation (U.S. Fish and Wildlife Service 2007).

Threats to the Chiricahua leopard frog were described in the final listing rule (USDI Fish and Wildlife Service 2002). The CLF recovery plan (USDI Fish and Wildlife Service 2007) identifies threats associated with disease or predation as the most important to the CLF. Also of high importance are:

- Degradation and loss of habitat as a result of water diversions and groundwater pumping, livestock management that degrades frog habitat, and increased likelihood of crown fires;
- Mining;
- Development;
- Environmental contamination;
- Disruption of metapopulation dynamics; and,
- Increased chance of extirpation or extinction resulting from small numbers of populations and the dynamic nature of frog habitats.

Critical Habitat

The primary constituent elements of critical habitat are:

- Aquatic breeding habitat and immediately adjacent uplands exhibiting the following characteristics:
 - Standing bodies of fresh water (with salinities less than 5 parts per thousand, pH greater than or equal to 5.6, and pollutants absent or minimally present), including natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, off-channel pools, and other ephemeral or permanent water bodies that typically hold water or rarely dry for more than a month. During periods of drought, or less than average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but they would still be considered essential breeding habitat in non-drought years.
 - Emergent and or submerged vegetation, root masses, undercut banks, fractured rock substrates, or some combination thereof, but emergent vegetation does not completely cover the surface of water bodies.
 - Nonnative predators (e.g., crayfish (*Orconectes virilis*), bullfrogs (*Lithobates catesbeianus*), nonnative predatory fish) absent or occurring at levels that do not preclude presence of the Chiricahua leopard frog.
 - Absence of chytridiomycosis, or if present, then environmental, physiological, and genetic conditions are such that allow persistence of Chiricahua leopard frogs.
 - Upland habitats that provide opportunities for foraging and basking that are immediately adjacent to or surrounding breeding aquatic and riparian habitat.
- Dispersal and nonbreeding habitat, consisting of areas with ephemeral (present for only a short time), intermittent, or perennial water that are generally not suitable for breeding, and associated upland or riparian habitat that provides corridors (overland movement or along wetted drainages) for frogs among breeding sites in a metapopulation with the following characteristics:
 - Are not more than 1.0 mile (1.6 kilometers) overland, 3.0 miles (4.8 kilometers) along ephemeral or intermittent drainages, 5.0 miles (8.0 kilometers) along perennial drainages, or some combination thereof not to exceed 5.0 miles (8.0 kilometers).
 - In overland and nonwetted corridors, provide some vegetation cover or structural features (e.g., boulders, rocks, organic debris such as downed trees or logs, small mammal burrows, or leaf litter) for shelter, forage, and protection from predators; in wetted corridors, provide some ephemeral, intermittent, or perennial aquatic habitat.
 - Are free of barriers that block movement by Chiricahua leopard frogs, including, but not limited to, urban, industrial, or agricultural development; reservoirs that are 50 acres (20 hectares) or more in size and contain predatory nonnative fish, bullfrogs, or crayfish; highways that do not include frog fencing and culverts; and walls, major dams, or other structures that physically block movement.

Alternative A – 1987 Plan

Environmental Consequences

The 2004 and 2011 Biological Assessments are included here by reference for both the species and critical habitat.

Determination of Effect from the 2011 Biological Assessment

“Implementation of CMs has reduced effects to the CLF on the Forest. Livestock grazing does occur on the Forest, including within riparian habitats. However, as mentioned above, there are many areas with CLF habitat that are excluded from livestock grazing. Recreational use on the Coconino NF is considered high, and much of the recreation is dispersed, non-motorized recreation, which could include use in riparian areas. Minerals exploration is permitted within riparian areas on the Coconino NF, but there is also direction to assure that conditions remain the same or are improved through such a project. It appears that, for all of the Programs’ activities that could potentially have negative impacts to CLF, there are also S&Gs that eliminate or mitigate most of these potential impacts. However, we conclude that the continued implementation of the Coconino NF LRMP May Affect, and is Likely to Adversely Affect, the CLF.”

Additionally, the 1987 Plan does not have specific guidance or direction regarding the management of non-native aquatic species, such as fish and crayfish, that are threats to CLF populations however, Alternative A would address invasive animal species by managing habitat to maintain viable populations of wildlife and fish species, improving habitat for selected species, and not supporting the introduction of unapproved species (new p. 22-1, par 1 and 2).

“Implementing S&Gs that limit the number of roads within riparian habitats, regulate livestock grazing, limit timber harvesting to prescriptions that benefit riparian resources, or accommodate the implementation of recovery plans all would be considered positive S&Gs. However, they do not completely remove the potential negative effect to some of the PCEs. Livestock grazing, although light, still occurs within proposed CLF CH on the Coconino; and some of the minimum requirements for total riparian habitat or riparian composition could be inadequate to maintain suitability of CLF CH. Therefore, implementation of the S&Gs cannot be considered insignificant or discountable at the programmatic level, so the continued implementation of the Coconino LRMP May Affect, and is Likely to Adversely Affect proposed CLF CH.”

Because designated critical habitat includes the same sites and drainages as proposed critical habitat, the above finding is still applicable.

Alternative B – Modified Proposed Plan

Environmental consequences

Vegetation/PNVTs

Desired conditions for all riparian forest types describe conditions that would provide good habitat for Chiricahua leopard frogs. Goals are to have diverse native vegetation in multiple age classes, un-compacted soils, and ecosystems that are functioning within their natural potential.

The objective for riparian forest types is to restore at least 200-500 acres of non-functioning and functioning-at-risk riparian areas within 10 years following plan approval. This represents 5 to 12 percent of the riparian habitats that are currently non-functioning and functioning-at-risk (Table 3). The DEIS contains the acres of PNVTs that are non-functioning and functioning-at-risk.

Table 3. Acres of riparian habitats and amount departed from satisfactory condition.

PNVT	Total Acres	Acres Not in Satisfactory Condition*	Percent of Total Acres
Cottonwood Willow Riparian	2,507	1,228	49
Mixed Broadleaf Riparian	3,612	939	26
Montane Willow Riparian	3,829	1,072	28
Gallery Coniferous Riparian	200	0	0
Total:	10,148	4,104	40

*Derived from DEIS Table 4.

Guidelines call for establishment of streamside management zones to provide protections from management activities, to limit livestock utilization to 20% of the woody vegetation, to keep mesquite bosques unfragmented, to have three or more age classes present, and to maintain 80% of natural herbaceous vegetative cover.

For the pinyon-juniper types that surround existing CLF sites, desired conditions describe a mosaic of trees with connectivity of openings, vegetation that is resilient to disturbances, and plant litter, coarse woody debris and nurse trees that provide good understory conditions. Although general, desired conditions for these pinyon juniper types would support good upland conditions surrounding CLF sites. Objectives are to mechanically treat 1,000 – 10,000 acres of pinyon juniper within 10 years, and to use naturally ignited fires to treat 3,750 acres in pinyon juniper evergreen shrub. These treatment acres represent a miniscule amount of the total pinyon juniper on the Forest, and are unlikely to make a big difference for CLF upland habitat conditions. There are no standards or guidelines for pinyon juniper that address treatment adjacent to tanks or riparian that would guide treatments adjacent to CLF habitat.

The direction for improvement of riparian habitats is not as strong as Alternative A, since that alternative calls for all riparian habitats to be in or trending towards satisfactory conditions by 2030.

Watersheds

Desired conditions describe watersheds with high geomorphic, hydrologic, and biotic integrity with natural processes maintaining physical and biologic processes. Desired conditions for water quality and quantity emphasize native aquatic species.

The objective to improve impaired and functioning-at-risk watershed so they are trending towards functioning condition within 10 years could benefit Chiricahua leopard frogs since the condition of the watersheds the frogs currently occur are functioning-at-risk.

Watershed guidelines emphasize protection of human health and safety and on priority 6th code watersheds, and don't emphasize protection of frogs or enhancement of their habitats. Depending on how watersheds with existing frogs or potential habitat rank in the prioritization process, Chiricahua leopard frogs and their habitat may not receive treatments necessary to improve conditions.

Water Quality, Water Quantity, and Aquatic Systems

Following guidelines for water quality and quantity at the project level should benefit the CLF by limiting the risk of transport of organisms among watersheds, meeting water quality standards, and management of instream flows. These guidelines will help ensure frogs have clean water supporting aquatic food sources and enough water to survive and reproduce. Guidance in this Alternative for water quality is similar to Alternative A.

Desired conditions for springs describe conditions that would benefit the CLF if present.

The objective to reconstruct or restore at least 25 springs over 10 years could benefit the CLF by improving habitat the CLF could naturally colonize, if restored springs were close enough to occupied sites, or by providing habitat frogs could be stocked into.

Soils

Desired conditions emphasize maintaining soils in satisfactory conditions, and minimizing compaction and erosion by maintaining diverse herbaceous component combined with litter and tree, with an objective to improve impaired and unsatisfactory soil conditions on 100,000 to 350,000 acres within 10 years (10,000 to 35,000 per year) following plan approval. Alternative A which has been treating about 20,000 acres per year (USDA Forest Service 2013) which is within the range for Alternative B. If implemented in watersheds that contain occupied or potential habitat, this would benefit CLF by providing clean water that supports aquatic food sources, and herbaceous and other terrestrial vegetation to provides cover and terrestrial food sources.

Wildlife, Fish, and Botanical Resources

Desired conditions for wildlife are to provide habitat that supports viable, self-sustaining populations that allow for successful repatriation of extirpated species, as well as contributing to the survival and recovery of listed species once repatriated.

While all five of the objectives could be beneficial for CLF, two are particularly so: one that calls for implementing at least 20 recovery actions in 10 years, and the other to restore/enhance at least 70 miles of stream habitat. Because the CLF is one of the most at-risk species in the Southwestern Region, the forest has been, and is likely to continue to implement recovery actions. Improvement in stream and wetland habitats within CLF historic range could provide habitat for re-introduction.

Fire Management

Desired conditions for wildland fires to move ecosystems toward their desired conditions and burn within the range of intensity and frequency of the historic fire regime of the affected vegetation communities, and that uncharacteristic high severity fires rarely occur could be beneficial to CLF by improving watershed conditions within occupied and potential PNVTs.

Livestock Grazing

Compared to Alternative A, Alternative B livestock grazing specific guidance is less explicit to protect CLF. Alternative B only addresses protection of riparian through placement of salt and

other supplements away from riparian, and by calling for range improvements to be located and used in a way that minimizes impacts to riparian. Conversely, Alternative A has a number of forestwide and MA12 livestock grazing standards and guidelines to protect wet meadows and riparian areas from concentrations and overuse by livestock, to provide waters for wildlife and livestock away from riparian communities, and many s&g's to restore riparian areas. An MA12 objective states: "Construct 10 miles of fence per decade for the first two decades where necessary to protect key wet meadows, wetlands, and riparian regeneration from grazing." There are other objectives for stream and lake habitat improvement that would benefit CLF as well by providing escape cover and improved riparian habitat.

Forest Products

Desired conditions call for providing a sustainable supply of forest products within the capacity of the land, silvicultural treatments that reflect natural disturbance regimes, integration of wildlife habitat with timber management activities. This provides some assurance that CLF habitat needs will be considered in pinyon juniper treatments where frogs currently occur, and in other forest types with potential habitat, but otherwise there are no standards or guidelines to provide sideboards on project implementation. Forestwide Forest Products (Timber) guidance in Alternative A is similar to Alternative B in that it emphasized integration of wildlife needs to provide suitable habitat.

Heritage Resources and Tribal Relations

Desired conditions, objectives, and guidelines for heritage resources and tribal relations are not likely to impact the CLF.

Infrastructure (Roads and Facilities)

Desired conditions clearly articulate a roads and facilities program that is managed to avoid or minimize impacts to wildlife. Road guidelines provide strong sideboards that can be applied to protect CLF and its habitat. Guidelines for road maintenance, new road construction, road relocation, and road crossings will result in avoidance or minimization of impacts. Habitats for threatened, endangered, and sensitive species that are susceptible to roads as barriers or roads that are mortality hazards are prioritized for decommissioning. Since frogs are susceptible to being run over and can disperse up to several miles overland and along drainages, these guidelines will serve to protect the CLF.

The specific objective to naturalize or decommission 200 – 800 miles of unauthorized roads, given the prioritization factors given above, could provide a benefit to current or future occupied CLF habitats.

Land Adjustments

See Consequences Common among All Alternatives for Threatened and Endangered Species.

Special Uses

Land and recreation special uses desired conditions incorporate general resource and environmental protections in most sections. Specific to wildlife, DCs state that location of new large, linear infrastructure has minimal effects to wildlife and minimizes habitat fragmentation; existing communication sites and utility corridors are used if environmentally acceptable before using new sites, and alternative energy developments such as wide energy, are designed to minimize impacts to wildlife. If any of these developments are proposed in CLF habitat, these guidelines will ensure due consideration for the frogs.

A protective guideline for CLF and their habitat is to generally not give recreation special use permits for activities proposed to occur within 200 feet of perennial streams, springs, or sensitive waters. This will help protect current and potential CLF sites and habitat from disturbance and habitat alternation from intense recreation use.

Recreation - Dispersed

Desired conditions for dispersed recreation call for balancing recreation activities with the ability of the land to support them and with other Forest DCs, and that recreation activities don't impact resources such as wildlife. Resource damage from unauthorized motored trails is minimal and motorized trails are located to have minimal impacts on wildlife resources. Interpretation and education includes wildlife and fish resources. Resource damage from camping is minimal and sites are rehabilitated as needed. Impacts to meadows and riparian areas are limited to road and trail crossings, and access points. Trails in riparian areas that are causing impacts are prioritized for closure, rehabilitation, or mitigation. These DCs, while not excluding impacts from recreational activities to CLF and their habitat, clearly have the intent to minimize habitat and disturbance impacts.

Guidelines for new dispersed recreational activities and motorized dispersed camping access routes call for protection of the natural environment and avoidance of environmentally sensitive areas, which would include CLF habitat. Additionally, dispersed sites should be closed, rehabilitated, or mitigated when unacceptable environmental damage is occurring; therefore, if CLF sites are being negatively impacted by dispersed recreation, the Modified Proposed Plan would support protection of these sites.

Recreation Opportunity Spectrum

Table 4. Acres by ROS class within the West Mogollon MA by alternative.

	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	14,745	4,378	51,088	70,211	28,190	0	0	0	98,402
Alt. B	16,553	13,515	46,612	76,680	21,722	0	0	0	
Alt. C	29,059	6,318	41,724	77,101	21,300	0	0	0	
Alt. D	14,581	14,751	47,147	76,479	21,923	0	0	0	

*Includes WOS for Alternatives B, C, D.

Table 5. Acres by ROS class within the East Clear Creek MA by alternative.

	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	0	2,434	12,375	14,809	97,605	0	0	818	113,217
Alt. B	0	46,103	42,527	88,630	24,431	216	0	0	
Alt. C	4,960	65,402	19,931	90,293	22,767	216	0	0	
Alt. D	0	46,103	42,527	88630	24,431	216	0	0	

*Includes WOS for Alternatives B, C, D.

Table 6. Miles of Chiricahua leopard frog critical habitat by ROS class by alternative.

	Non-forest	P	SPNM	SPM	Subtotal Primitive	RN	R	U	Total
Alt. A	0	0	0.3	6.6	6.9	0	0	0	6.9
Alt. B	0	0	0.1	6.8	6.9	0	0	0	6.9
Alt. C	0	1.9	0.1	4.9	6.9	0	0	0	6.9
Alt. D	0	0	0.1	6.8	6.9	0	0	0	6.9

Scenic Resources

In the desired conditions for scenic resources, properly functioning ecosystems are important components of scenic quality. This supports integration of CLF habitats and management needs. Although some management activities could impact scenic integrity objectives (SIO) (such as fencing, stream structures, etc.) depending on the objective identified within CLF habitat, guidelines allow for site-specific consideration of construction of structures without the need to amend the forest plan.

Wilderness

Table 7. Riparian PNVT Acres and percent of total PNVT acres within Proposed Wildernesses.

	Cottonwood Willow	Mixed Broadleaf	Montane Willow	Wetland Cienega
Davey’s	0	30 (0.8%)	0	0
Walker Mountain	7 (0.3 %)	19 (0.5)	0	0
Total Acres:	7 (0.3%)	49 (1.4%)	0	0

Determination of Consequences

Compared to Alternative A, this alternative is less explicit and protective with respect to livestock grazing, but other direction in B is stronger, such as for aquatic invasives and disease, the objective for restoration of springs, and the objective to implement recovery actions.

Alternative C

Environmental consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Proposed wilderness areas. The following table supplements the narrative in the DEIS.

Table 8. Riparian PNVT Acres within Chiricahua leopard frog MAs and percent of total PNVT acres within Proposed Wildernesses. Those in italics are also proposed in Alternative B.

	Cottonwood Willow	Mixed Broadleaf	Montane Willow	Wetland Cienega
Barbershop	0	0	170	0
Black Mountain	17	169	0	0
Cedar Bench	0	11	0	0
Cimmaron	38	45	0	0
<i>Davey's</i>	<i>0</i>	<i>30</i>	<i>0</i>	<i>0</i>
East Clear Creek	0	0	263	0
Hackberry	348	54	0	0
<i>Walker Mountain</i>	<i>7</i>	<i>19</i>	<i>0</i>	<i>0</i>
Total Acres:	410 (16%)	328 (9%)	433 (11%)	0

2. WHMAs: No WHMAs overlap occupied sites, the West Mogollon MA or critical habitat.

Table 9. Riparian and wetland PNVTs within Wildlife Habitat Management Areas (WHMA) within potential habitat/historic range of Chiricahua leopard frogs.

	Cottonwood Willow	Mixed Broadleaf	Montane Willow	Wetland Cienega	Total Acres by WHMA
East Clear Creek	0	0	666	12	678
Hospital Ridge	0	0	103	6	109
Knoll Lake	0	0	4	0	4
Limestone Pasture	0	0	23	0	23
Second Chance	0	0	0	0	0
Total Acres: by PNVT	0	21 (0.6%)	1,142 (30%)	18 (0.2%)	

3. There is no occupied or potential habitat in Walnut Canyon, Sedona-Oak Creek, Long Valley, and Flagstaff Neighborwoods Management Areas, so there will be no effects to CLF.
4. There is no occupied or potential habitat in the Walnut Canyon Management Area, so there will be no effects to CLF.

5. There is no occupied or potential CLF habitat within RNAs, so restriction on grazing will not impact CLF.
6. Old growth designation will not impact the CLF.

Recreation Opportunity Spectrum

Compared to Alternative B, Alternative C sets ROS objectives that shift 422 acres from RN to more primitive classes, and about 12,000 acres from SPNM and SPM into P in the West Mogollon MA (Table 4). This will benefit existing populations of frogs by reducing disturbance and potential habitat impacts. The same pattern holds for the East Clear Creek MA, although even more acres are shifted from RN to the more primitive ROS classes (Table 5).

Currently, all critical habitat is within the more primitive ROS classes (Table 6). Alternative C shifts 1.9 acres (28%) of critical habitat from SPM to P because of the Cimmaron-Boulder PWA, providing even greater benefits to frogs by managing for minimal roads, therefore, fewer disturbance impacts and less chance for transmission of disease.

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative C May Affect the Chiricahua leopard frog and critical habitat, primarily through indirect effects of management of potential habitat that could support re-introduction of frogs. Designation of wildernesses will have a mixture of positive and negative impacts. The designation of WHMAs will positively impact riparian habitat within the East Clear MA, increasing the potential for re-introduction of frogs. Considering both positive and negative impacts, Alternative C has similar net effects to Alternative B.

Alternative D

Determination of Consequences

Overall, this alternative would have similar effects as Alternative B.

4. Mexican Gray Wolf

Existing Condition/Affected Environment

On the Coconino, wolves were reported to be fairly common, if not particularly numerous, in the vicinity of the San Francisco Peaks in the mid-1800's (Davis 1982). Hoffmeister (1986) lists one gray wolf specimen from Kendrick Peak in 1913. Additionally, Cockrum (1960) lists an additional specimen examined from nearby Williams, Arizona, on the Kaibab National Forest. In 1942, the last reported wolf from north of the Mogollon Rim and northern Arizona was trapped near Limestone Point about 40 miles southwest of Winslow (Brown 1983). This location would be on the Coconino or nearby on the Apache-Sitgreaves National Forest.

Because of the wide-ranging nature of wolves and the lack of specific vegetative habitat requirements, most of the forested areas of the Coconino NF probably provided suitable habitat.

Mexican gray wolves are not associated with desert habitats. Den sites may have been more limiting than foraging and dispersal areas, but most of the Forest is broken and dissected by drainages, the San Francisco Peaks, and the Mogollon Rim, so there are likely to be many potential den sites. Prey and water availability is probably most important in determining distribution and habitat use by wolves. Deer and elk are primary prey species.

Wolves that occasionally make forays onto public lands outside of recovery areas will not routinely be captured and returned, but any wolves that cause livestock depredation and/or establish territories will be captured and returned to the designated recovery area(s) (U.S. Fish and Wildlife Service 1998).

Wolves have ventured onto the Coconino National Forest at least twice. In September of 2000, one female wolf was reported near Highway 87 on the Mogollon Rim Ranger District (pers. comm. A. Watt, Wolf Recovery Project to L. Sears, Coconino National Forest, documented in 9/29/2000 email). In October of 2001, one male wolf moved away from its pack and traveled north and west, and spent some time around Mormon Lake (USDI Fish and Wildlife Service 2001a). He moved off of the Forest and back towards the recovery area on his own. A report prepared as a result of a 5-year review of the reintroduction program shows maps of two separate dispersal movements of wolves to areas within the Coconino National Forest boundary (Interagency Field Team 2005), which probably represents these two movement events on the Forest.

Alternative B – Modified Proposed Plan

Determination of Consequences

The addition of three wilderness areas provides a slightly greater benefit compared to Alternative A.

Alternative C

Environmental Consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Proposed wilderness areas. See DEIS.
2. WHMAs. See DEIS.
3. Expansion of the Cottonwood Basin Fumaroles Geological Area would have no impact to wolves since the area is out of their range.
4. Walnut Canyon, Sedona-Oak Creek, Long Valley, and Flagstaff Neighborwoods Management Areas are on the west and northern portions of the Experimental Population Area. Restricting shooting activities could reduce disturbance to wolves if they visit those areas, but the likelihood of wolves in this area is low, therefore the benefits would be minimal.

5. Restricting snowmobiling could reduce disturbance to wolves if they visit those areas, but the likelihood of this being a conflict with wolves is low, therefore the benefits are minimal.
6. Restrictions on grazing in RNAs would not impact wolves.
7. Old growth designation would not impact wolves.

Determination of Consequences

The addition of 10 recommended wilderness areas and designating WHMAs provides a slightly greater benefit compared to Alternatives A and B.

Alternative D

Environmental consequences

Not adding any new wilderness areas makes this aspect of this Alternative D the same as Alternative A, losing the slight benefit of the designation of the three wildernesses to wolves in Alternative B.

The botanical and geological areas are scattered around the Forest and represent very small acreages. Allowing mechanized recreation will not have any impacts on wolves.

Determination of Consequences

Overall, not adding any new wilderness areas or including WHMAs makes this alternative similar for wolves to Alternative A.

5. Mexican Spotted Owl and Critical Habitat

Existing Condition/Affected Environment

Species

The MSO was listed as a threatened species in 1993 (USDI Fish and Wildlife Service 1993). The primary threats to the species were cited as even-aged timber harvest and stand-replacing wildland fire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the MSO population. The US Fish and Wildlife Service (FWS) appointed the MSO Recovery Team in 1993, which produced the Recovery Plan in 1995 (USDI Fish and Wildlife Service 1995). The FWS issued a revised Recovery Plan in 2012 (USDI Fish and Wildlife Service 2012b).

Mexican spotted owls are nocturnal predators that feed primarily on small mammals. They are “perch and pounce” predators that locate prey from an elevated perch by sight or sound, then pounce on the prey and capture it with their talons. They consume a variety of prey throughout their range, but commonly eat small and medium sized rodents such as woodrats, mice, and voles. They also eat bats, birds, reptiles, and arthropods.

Over 90 percent of the suitable MSO habitat on the Coconino NF has been surveyed. Any unsurveyed habitat probably occurs in remote wilderness or in marginal potential habitat. Surveys were done to Southwestern Regional protocols; however, some are becoming outdated.

Of the 190 MSO protected activity centers (PACs) that are completely or partially on the Coconino National Forest, 182 are completely within Coconino NF boundaries, 4 overlap with Walnut Canyon National Monument, 3 with the Apache-Sitgreaves NF, and 1 with the Kaibab NF. PACs are established at all MSO known and historical sites and are at least 600 acres in size, encompassing known nests, roosts, and the best available habitat in the area. The breeding season is March 1 to August 31.

MSO use cliffs and canyons within mixed conifer and pine-oak types, particularly on the Mogollon Rim Ranger District. MCA occurs primarily on the San Francisco Peaks and MCFF is primarily along the Mogollon Rim, but both types occur in other locations.

Owls use a subset of pine-oak habitat that has the conditions they need for nesting, roosting, and foraging. Pine-oak habitat is defined differently among the Forest Service and the MSO recovery plan (USDI Forest Service 2012b). The recovery plan defines pine-oak habitat for the MSO as:

Any stand within the Ponderosa pine series that meets the following criteria simultaneously:

- a. The stand is located in the UGM Ecological Management Unit (EMU), the BRW EMU, or the Zuni Mountains or Mount Taylor regions of the CP EMU.
- b. Habitat types that reflect Gambel oak or a Gambel oak phase of the habitat type.
- c. >10% of the stand BA or 4.6 m²/ha (20 ft²/ac) of BA consists of Gambel oak >13 cm (5 in) in diameter at root collar.

The Forest Service definition is for 10% cover of Gambel oak, without a minimum size (Overby 2011, personal communication from S. Martin).

Critical Habitat

Critical habitat is designated by the FWS to provide for the survival and recovery of listed species. Critical habitat for the Mexican spotted owl was originally designated in 1995, and has been re-designated in 2001 and 2004. The current designation was published in a Final Rule on August 31, 2004, effective as of September 30, 2004. Approximately 8.6 million acres of critical habitat was designated on Federal lands in Arizona, Colorado, New Mexico, and Utah (USDI Fish and Wildlife Service 2004). In Arizona, 3,228,145 acres were designated on National Forest System lands. Critical habitat units occur on the Coconino National Forest acres within the Upper Gila Mountains Recovery Unit.

The FWS determined the primary constituent elements for Mexican spotted owl from studies of their habitat requirements and the information provided in the Mexican spotted owl Recovery Plan (USDI Fish and Wildlife Service 1995 and references therein). Since owl habitat can include both canyon and forested areas, the FWS identified primary constituent elements in both areas. The primary constituent elements for MSO include (USDI Fish and Wildlife Service 2004):

A. Primary constituent elements related to forest structure:

1. A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 to 45 percent of which are large trees with a trunk diameter of 12 inches (0.3 meters) or more when measured at 4.5 feet (1.4 meters) from the ground.
 2. A shade canopy created by the tree branches covering 40 percent or more of the ground; and
 3. Large dead trees (snags) with a trunk diameter of at least 12 inches (0.3 meters) when measured at 4.5 feet (1.4 meters) from the ground.
- B. Primary constituent elements related to maintenance of adequate prey species:
1. High volume of fallen trees and other woody debris;
 2. A wide range of tree and plant species, including hardwoods; and
 3. Adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration.
- C. Primary constituent elements related to canyon habitat include one or more of the following:
1. Presence of water (often providing cooler and often higher humidity than surrounding areas);
 2. Clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, and/or riparian vegetation;
 3. Canyon wall containing crevices, ledges, or caves; and
 4. High percent of ground litter and woody debris.

All areas within critical habitat unit boundaries are defined as critical habitat. However, Federal actions within critical habitat boundaries do not trigger Endangered Species Act section 7 consultation with the U.S. Fish and Wildlife Service unless actions may affect the MSO or protected or restricted habitat, and at least one of the primary constituent elements.

Cumulative Consequences Common to All Alternatives

Other Forest Plans that guide activities on lands within the Upper Gila Mountains EMU would contribute cumulatively to effects of Coconino Forest Plan guidance. Other Forests in the UGMRU are the Apache-Sitgreaves, Cibola, Gila, Kaibab, Prescott, and Tonto NFs. Current direction for all of these Forests, including the Coconino, has detailed and specific guidance for managing the MSO per common guidance issued through the 1996 Regional Amendment. This amendment essentially made Region 3 Forest plans consistent with the 1995 MSO recovery plan. In addition to the Coconino, other Forests within the UGMRU currently in the Forest plan revision process are the ASNF, Kaibab, and Prescott NFs. The ASNF has published a draft EIS (January 2013) that finds that all alternatives May Affect the MSO, but that implementation of the alternatives will minimize the likelihood of incidental take and would contribute to recovery. The Prescott's DEIS (August 2012) has similar finding for the MSO. The Kaibab NF has also published a draft EIS (April 2012) that discloses that individual plan components would negatively affect the MSO but that viability will be maintained.

Activities on state and private lands can also contribute cumulatively. Thinning or clearing and land development can permanently alter or destroy habitat, as well as fragmenting habitat. Recreational use of the forest adjacent to private lands can cause disturbance to owls. In general, activities on state and private lands contribute negatively to cumulative impacts on MSO and their habitat.

Alternative A – 1987 Plan

The 2004 and 2011 Biological Assessments are included by reference for both the species and proposed critical habitat.

Alternative B – Modified Proposed Plan

Environmental Consequences

Vegetation/PNVTs

Ponderosa Pine

Old growth conditions needed by MSOs are not specifically described for the Gambel oak subtype, but desired conditions would apply PNVT-wide.

Desired conditions for ponderosa pine describe tree density ranges from 20 to 80 square foot basal area per acre, but denser tree conditions occur in some locations such as north-facing slopes and canyon bottoms. Large snags 18 or greater DBH average 1-2, and downed logs average 3 per acre.

Specifically for the Gambel oak subtype, desired conditions are:

- The Gambel oak sub-type is reproducing and maintaining its presence on suitable sites across the landscape. Large to moderate sized oak snags are scattered across the landscape, as are moderate to large live oak trees with dead limbs, hollow boles, and cavities. These provide shelter and nesting habitat for a variety of wildlife species, including owls and bats. (landscape scale)
- Large oak trees and pine-oak groups provide cool, moist microsites. Gambel oak acorns provide food for wildlife species. (fine scale)
- To promote old growth attributes consistent with desired conditions, manage for large Gambel oak trees and snags to be sustained over time. (guideline)

Objectives for the ponderosa pine PNVT are as follows:

- Use prescribed cutting (i.e., group selection or free thinning) to treat 50,000 to 260,050 acres of Ponderosa Pine during the 10 years following plan approval. Treatment priorities should move forest priority 6th code watersheds toward satisfactory conditions.
- Use prescribed fire to underburn (low severity) 150,000 to 300,000 acres of Ponderosa Pine during the 10 years following plan approval. Treatment priorities should move forest priority 6th code watersheds toward satisfactory conditions.
- Use naturally ignited fires (i.e. lightning-caused fires) to treat at least 135,000 acres with low severity fire to move vegetation towards desired conditions during the 10 years following plan approval.

Four of the guidelines emphasize the protection of existing old growth, to promote development of future old growth, and to protect old trees, including Gambel oaks. Another guideline emphasizes snags and downed logs along edges of openings and within groups and clumps of trees, and another promotes small mammal habitat.

Collectively, the desired conditions, objectives and guidelines would provide fairly well for the habitat needed by MSO. Although the overall ponderosa pine type would move towards more open stand conditions, provisions for maintaining a portion of the landscape in denser habitats will provide the more closed canopy conditions used by the MSO. Opening up stand conditions within the PNVT would be expected to reduce the risk of uncharacteristic wildfires that can seriously impact habitat. Maintaining a large snag component would benefit the MSO.

Compared to Alternative A, management for old growth is less explicit in the amount to manage for. Alternative B desired conditions do not clearly identify the amount of old growth to maintain or develop. Desired proportion of seral stages for mid-age and mature/old forests are not separated out.

Mixed Conifer with Frequent Fire (MCFF)

Although the PNVT consists predominately of vigorous trees, declining trees are well-distributed throughout the landscape. The size and shape of trees, number of trees per group, and number of groups per area is variable, with openings ranging from 10-50% of the landscape. Downed logs >12 inches diameter at mid-point, and large snags 18 or greater DBH average 3per acre. Coarse woody debris ranges from 5 to 15 tons per acre. The composition, structure, and function of vegetative conditions are resilient to disturbances and climate variability.

At the mid-scale (100 to 1,000 acres), tree density ranges from 30 to 100 square foot basal area per acre, with denser conditions in some locations such as north facing slopes and canyon bottoms. Within the WUI, forest structure may be at the lower end of the range of desired conditions for levels of snags, logs, coarse woody debris, tree density, with groups of trees more widely spaced apart. Aspen and maple are present in groups or patches that are vigorous and regenerating. Low severity fires occur every 1 to 35 years, including throughout the range of the MSO.

At the fine scale, tree groups are typically less than one acre, but may be larger in areas managed for the MSO. Mistletoe is present in isolated pockets. Openings and meadows are well-distributed. In management-created openings > 1 acre, 3-5 reserve trees are retained and can be clumped for wind firmness.

One of the objectives for MCFF is:

- Mechanically thin using methods such as group selection and free thinning 14,000 acres during the 10 years following plan approval.

There are no standards, but there are two guidelines for MCFF. The first two are to protect existing old growth from uncharacteristic disturbance and to encourage the development of old growth in areas where it is lacking.

Mixed Conifer with Aspen

At the landscape scale, general desired conditions are similar to MCFF, but with greater canopy cover and openings within the landscape are not described.

At the mid-scale, MCA desired conditions are similar to MCFF, with a few exceptions. Tree density ranges from 20 to 180 square feet basal area per acre, 1 to 5 snags 18 inches or greater occur per acre, and coarse woody debris ranges from 5 to 35 tons per acre depending on seral stage. Aspen occurs as a mosaic with vigorous, regenerating groups and patches. Mixed and high severity fires occur, but high severity patches do not exceed 1,000 acres in size.

At the fine scale, mid-aged and older forests have variably-spaced groups and clumps of trees with interlocking crowns. Small openings are present.

There are no objectives, standards or guidelines for MCA.

In summary for mixed conifer habitat, although they are not very specific to the MSO, MCA desired conditions encompass habitat components needed by Mexican spotted owls. Over 10 years, 15,500 (31%) of MCFE would be treated with fire. Combined with direction to follow recovery plans, mixed conifer habitat would be managed for and enhanced at the project level, and threat of catastrophic fire will be reduced.

Recreation Opportunity Spectrum

The following tables supplement the narrative in the DEIS.

Table 10. Acres by ROS class within PACs by alternative (totals exclude non-forest).

	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	22,460	11,566	20,335	54,361	63,652	190	0	112	118,315
Alt. B	22,220	22,262	30,290	74,772	44,128	190	0	7	
Alt. C	25,430	27,079	22,075	74,584	43,533	190	0	7	
Alt. D	22,220	21,398	30,371	73,989	44,128	190	0	7	

*Includes WOS for Alts. B, C, D.

Table 11. Acres of MSO critical habitat by ROS class by alternative.

	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	80,927	29,105	91,448	201,480	343,593	1,921	0	843	547,838
Alt. B	76,275	75,476	157,000	308,751	235,761	3,294	0	32	
Alt. C	84,679	104,761	124,876	314,316	230,196	3,294	0	32	
Alt. D	76,274	75,476	157,000	308,750	235,761	3,294	0	32	

*Includes WOS for Alts. B, C, D.

Wilderness

Alternative B proposes three new wilderness areas: Davey’s, Strawberry and Walker Mountain, none of which contain PAC or critical habitat.

Determination of Consequences

Unlike Alternative A, which contains a lot of specific direction for the MSO and its habitat, this alternative does not contain much specific guidance for the MSO; instead, the Modified Proposed Plan points to direction within approved recovery plans, and has other plan direction common to all federally-listed species (see that section at the beginning of the federally-listed section) as the

primary guidance applicable to MSO. However, desired conditions and other plan components for the primary vegetation types used by the MSO encompasses habitat conditions they need, including the primary constituent elements for critical habitat.

Pointing to guidance in recovery plans, and emphasizing recovery also makes the consequences of this alternative the same as Alternative A in this regard. However, Alternative A has clearer guidance for the minimum amount of old-growth to manage for and maintain on the landscape, and provides for larger groups (stand size) in old growth conditions, which would better ensure that MSO mature and old forests are managed for. Therefore, overall impacts of Alternative B would be similar to Alternative A, except for the more explicit and stronger guidance for old growth in Alternative A.

Alternative C

Environmental consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Wilderness: See DEIS.
2. WHMAs: See DEIS
3. Expanding the Cottonwood Basin Fumeroles Geological Area will have no impacts since there is no MSO habitat within the area.
4. Recreational shooting: The following table supplements the narrative in the DEIS.

Table 12. Number and acreage of Protected Activity Centers (PAC) within Management Areas (MA) designated as not suitable for recreational shooting. The number of PACs reflects those will all or a portion of their boundaries within MAs.

Management Area	Number of PACs	PAC Acres
Flagstaff Neighborwoods	1	171
Long Valley	54	26,187
Sedona/Oak Creek	22	10,678
Walnut Canyon	5	1,881
Totals:	82	38,917

5. Snowmobile use: See DEIS.
6. RNAs: See DEIS.
7. Old Growth: See DEIS.

Determination of Consequences

The guidance contained in this alternative is stronger than Alternatives A and B. Plan guidance would result in fewer disturbances to the MSO through designation of wildernesses and restriction on shooting and snowmobile use in some MAs, by improving food and cover for prey species in the Walnut Canyon MA, and through emphasis on habitat management in WHMAs. Retaining the old growth standards and guidelines would provide stronger direction regarding the amount and stand size of old growth to manage for.

Alternative D

Determination of Consequences

Overall consequences would be similar to Alternatives B, with one PAC and critical habitat having slightly greater disturbance due to allowing bicycle use within the Mogollon rim botanical area.

6. Northern Mexican Gartersnake

Existing Condition

The northern Mexican garter snake (Mexican gartersnake or NMG) is usually found in or near streams and ponds in canyons up to 6,200 feet in elevation. This gartersnake is most closely linked to shallow slow-moving or impounded waters, though it also occurs in other aquatic environments. The Mexican gartersnake's diet consists of leopard frogs, toads, tadpoles, various native fishes and lizards and small rodents which are taken during occasional terrestrial forays.

Surveys for Mexican gartersnakes have been conducted on a limited basis along the main tributaries and the Verde River. The only location where Mexican gartersnakes have been detected is at Page Springs and Bubbling Ponds Fish Hatchery and along Oak Creek in the vicinity of the two hatcheries. These sites are being closely monitored by the Arizona Game and Fish Department. While occupied habitat is in cottonwood willow habitat, mixed-broadleaf riparian and wetland-cienega could provide potential habitat.

Cumulative Consequences Common to All Alternatives

Currently, Mexican gartersnakes are only known to occur within the forest's boundaries at the Page Springs and Bubbling Bonds fish hatcheries, owned by the AGFD. Management activities conducted at the hatcheries could impact the NMG, but AGFD recognizes that the hatcheries provide crucial habitat (http://www.azgfd.gov/h_f/hatcheries.shtml) and management considers the protection and enhancement of NMG populations and habitat (Overby 2011, personal communication with Valerie Boyarski, AGFD).

As a result of the AGFD's consultation with the Fish and Wildlife Service on the statewide fish stocking program, a number of conservation measures were included in the proposed action, and incorporated into the Biological Opinion (USDI Fish and Wildlife Service 2011). These measures include: providing for two new NMG populations, developing outreach materials to reduce

deliberate killing of NMG by the public, ensuring renovated streams are restocked with native prey species, conducting a statewide live bait use assessment and review bat program outreach materials, and review and update of programs on the risks to native aquatic species from the transport of nonnative aquatic species. These measures will provide positive cumulative impacts to NMG.

Alternative A – 1987 Plan

Environmental Consequences

Management guidance for riparian habitat is primarily contained with MA 12. Management of wildlife habitat is a key emphasis. There are multiple standards for maintaining overstory, three age classes of woody vegetation, stream shading, etc. In high elevation habitats, at least 80% of the potential shrub cover is to be maintained. Standards and guidelines call for protection of riparian from grazing.

Although all of MA 12 is for riparian management, riparian habitat guidance is scattered throughout the 1987 Plan. In forestwide wildlife, direction ensures that riparian standards apply to all areas, even if they are too small to map. S&Gs for MSO and goshawk also emphasize riparian management. Riparian habitat is identified as restricted habitat for MSO, and management is to maintain and restore healthy ecosystems and to improve degraded conditions as soon as possible. Utilization standards and guidelines for livestock grazing are to be implemented to maintain and restore riparian habitats. Similarly, goshawk guidelines also call for maintenance and restoration of healthy riparian ecosystems.

Forestwide range direction identifies riparian condition as a potentially significant issue that needs to be addressed during the environmental analysis for revising Allotment Management Plans every 10 years. Salt is not to be placed within ¼ mile of riparian habitats to avoid concentration of livestock. Range forage improvement calls for establishing woody riparian vegetation and to protect from livestock grazing through management and/or fencing to allow for establishment and eliminate overuse.

In addition to the objective to recover 80% of riparian habitats by year 2030 with the remaining 20% significantly improved, other objectives for protection and improvement of riparian habitats include construction of 10 miles of fence per decade and installation of stream habitat improvement projects in the first decade.

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative A *May Affect* the Northern Mexican gartersnake and its habitat. Collectively, the guidance in the 1987 Plan for riparian habitats contributes positively to this species by emphasizing recovery of habitat, and providing standards, guidelines, and objectives to guide improvement.

Alternative B – Modified Proposed Plan

Environmental Consequences

The objective to restore at least 200-500 acres of non-functioning and functioning-at-risk forested riparian areas within 10 years following plan approval represents 5 to 12 percent of the riparian habitats that are currently non-functioning and functioning-at-risk (Table 3).

Guidelines call for establishment of streamside management zones to provide protections from management activities, to limit livestock utilization to 20% of the woody vegetation, to keep mesquite bosques unfragmented, to have three or more age classes present, and to maintain 80% of natural herbaceous vegetative cover.

Non-native fish and other aquatic invasive animals and diseases can negatively impact populations. While Executive Order 13112 dealing with exotic invasive species would be followed under all alternatives, Alternative B describes desired conditions to prevent new introductions and to contain or eradicate known populations and guidelines to incorporate measures into project planning and implementation. While the consequences of implementing the E.O. would not differ among alternatives, language for invasive species management is more explicit in Alternative B.

Recreation Opportunity Spectrum

The forest plan sets the desired ROS (also called ROS objectives) that are used to determine if projects are compatible with Forest recreation goals. At the project-level, the desired ROS is used to determine if a project is moving toward or away from the desired ROS. ROS classes represent a continuum or spectrum from primitive and unmodified environments to highly urban and modified landscapes. The more primitive classes include Primitive (P), Semi-Primitive Non-Motorized (SPNM), and Semi-Primitive Motorized (SPM) and are characterized by relatively little or no developments and roads. The less primitive classes are Roaded Natural (RN), Rural (R), and Urban (U).

For the Cottonwood Willow Riparian PNV, approximately 94 acres moves away from more primitive ROS objectives in Alternative B (Table 13). For the Mixed Broadleaf Riparian PNV, about 170 acres shifts from the less primitive classes to more primitive classes in Alternative B, combined with a shift within the primitive classes of about 100 acres (Table 14). The most notable change within potential Mexican gartersnake habitat and ROS with Alternative B is in the Wetland Cienega PNV, where almost 5,560 acres shift from RN to SPM and SPNM (Table 15). In total, Alternative B shifts ROS objectives to more primitive classes for these PNVs, which will reduce disturbance and potential habitat impacts to potential Mexican gartersnake habitat.

Table 13. Acres by ROS class within the Cottonwood Willow Riparian PNVT by alternative.

	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	258	275	717	1,250	736	478	0	43	2,484
Alt. B	265	485	406	1,156	954	397	0	0	2,506
Alt. C	668	159	339	1,166	943	397	0	0	
Alt. D	258	491	406	1,155	954	397	0	0	

*Includes WOS for Alts. B, C, D.

Table 14. Acres by ROS class within the Mixed Broadleaf Riparian PNVT by alternative.

	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	1,469	262	648	2,379	1,000	232	0	0	3,611
Alt. B	1,517	384	648	2,549	822	233	0	0	3,604
Alt. C	1,796	191	590	2,577	793	233	0	0	
Alt. D	1,468	403	648	2,519	852	233	0	0	

*Includes WOS for Alts. B, C, D.

Table 15. Acres by ROS class within the Wetland Cienega PNVT by alternative.

	P*	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	0	69	2,186	2,255	7,384	230	0	10	9,869
Alt. B	0	6,343	1,570	7,913	1,735	230	0	0	9,878
Alt. C	0	7,036	972	8,008	1,642	230	0	0	
Alt. D	0	6,343	1,570	7,913	1,735	230	0	0	

*Includes WOS for Alts. B, C, D.

Wilderness

Of the 3 proposed wilderness areas, Davey’s has 30 acres of Mixed Broadleaf habitat, and Walker Mountain has 19 acres of Mixed Broadleaf and 7 acres of Cottonwood Willow (Table 16). Strawberry Crater does not contain any riparian habitat.

Table 16. Potential Mexican gartersnake riparian PNVT Acreage within Proposed Wildernesses (Davey’s, Strawberry, Walker Basin) in Alternative B.

	Wilderness Acres	Total PNVT Acres	Percent of Total
Cottonwood Willow	7	2,017	0.3
Mixed Broadleaf	49	3,612	1.4
Wetland Cienega	0	9,879	0

Designation of this small amount of wilderness that contains potential Mexican gartersnake habitat will be a small benefit by limiting roads, recreation, and development in these riparian PNVTs .

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative B *May Affect* the Northern Mexican gartersnake and its habitat. Collectively, the guidance in Alternative B will contribute positively to Northern Mexican gartersnake habitat as projects are implemented under the Modified Proposed Plan. Consequences would be fairly similar to Alternative A.

Alternative C

Environmental Consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. The acreage within proposed Wilderness represents 18% (452 ac) of the Cottonwood Willow PNV and 9% (328 ac) of the Mixed Broadleaf PNV.
2. Because of the small amount of riparian habitat in WHMAs, impacts to Northern Mexican gartersnakes and their habitat is negligible.
3. Expanding the Cottonwood Basin Fumeroles Geological Area will have no impact on the NMG since there is no riparian habitat within the area.
4. Recreational Shooting. See DEIS.
5. Designating the Walnut Canyon management area and areas with a Recreation Opportunity Spectrum objective of “semi-primitive non-motorized” as not suitable for snowmobile use, except to provide ingress/egress for private inholdings will have no impact on Northern Mexican gartersnakes.
6. Only 18 acres of Mixed Broadleaf Riparian is within RNAs, therefore, restricting grazing will have negligible impacts on Northern Mexican gartersnake habitats.
7. Retaining the 1987 Plan standards and guidelines for old growth will have no impacts on Northern Mexican gartersnakes.

Recreation Opportunity Spectrum

Compared to Alternative B, there is slightly more acreage (133 acres) shifted towards primitive ROS classes (Tables 13, 14, and 15), which leads to reduced disturbance and less potential habitat impacts to potential Mexican gartersnake habitat to a greater degree than Alternatives A and B.

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative C *May Affect* the Northern Mexican gartersnake and its habitat. The primary difference between this alternative and Alternatives A and B is that this alternative recommends designation of 18% of the Cottonwood Willow PNV and 9% of the Mixed Broadleaf Riparian PNV as wilderness,

providing additional protections for potential Northern Mexican gartersnake habitat. This provides more positive direction for NMG habitat than Alternative B.

Alternative D

Environmental Consequences

Not adding any new wilderness areas makes this aspect of this Alternative D the same as Alternative A. The effects are also similar to Alternative B, since so few acres in NMG riparian PNVTs are within proposed wilderness areas in Alternative B. ROS class distribution is also similar to Alternative B, but 41 fewer acres shift to primitive than Alternative B.

There is no occupied NMG habitat within botanical or geological areas and only a very small amount of riparian habitat within two botanical areas (Fossil Springs and Mogollon Rim) that have riparian habitat. Allowing bicycles on designated trails in botanical and geological areas would have no appreciable effects on the NMG or its habitat.

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative D *May Affect* the Northern Mexican gartersnake and its habitat. Overall, this alternative differs very little from Alternative B, so consequences are similar.

7. Southwestern Willow Flycatcher and Designated and Proposed Critical Habitat

Existing Condition

Species

Nesting southwestern willow flycatchers (SWWF) prefer dense riparian thickets in areas where perennial flow, surface water, or saturated soil is present from April through September. In most riverine situations, associated channels are wide and shallow with a well-defined floodplain and a broad valley. Streams are slightly entrenched with well-defined meanders and riffle/pool bed features. Quiet water dominates, as in backwaters, pools, beaver ponds, or non-riffle stream stretches.

Vegetative species composition and structure varies across the range of the southwestern willow flycatcher. The variation ranges from homogeneous patches of one or several species with a single canopy layer to heterogeneous patches of numerous species with existing under, mid, and over stories. Canopy covers are consistently high (>90%) throughout the range (Spencer et al. 1996). In the Verde Valley, nesting willow flycatchers occur in tamarisk and mixed riparian habitats. Patch width of breeding sites in both tamarisk and mixed riparian habitat types tend to be more linear, varying from 460 feet to 1,640 feet in maximum width (Sferra et al. 1995). Overstory canopies average between 50 and 55 feet tall (Spencer et al. 1996). Patch size varies from 5 to 121 acres in mixed riparian and tamarisk (Spencer et al. 1996).

In 1994, habitat suitability for southwestern willow flycatchers was determined at various locations across the district. Surveys were conducted in areas that appeared to have either potential or suitable habitat. Sites on National Forest System (NFS) lands that have been surveyed for occupancy (based on the presence of suitable or potential habitat) include: Verde River @ powerlines, White Bridge, and Tapco; Oak Creek @ Cornville bridge, Mormon Crossing, Red Rock Crossing; Spring Creek; Sheepshead; Dry Beaver Creek @ Stagestop; Wet Beaver Creek @ campground; West Clear Creek @ Bull Pen, lower campground, and General Crook Trail Crossing; and Fossil Creek. Many of these sites were surveyed for years until lack of detections and marginal habitat caused FS biologists to cease surveys. The only surveyed sites on NFS land that have had flycatcher detections include Dry Beaver Creek @ Stagestop (transient male in 1993 and floater male in 2007), Sheepshead (transient male in 1998), Wet Beaver Creek (transient male in 1993) and West Clear Creek Campground (transient male in 1997). The Sheepshead and Dry Beaver Creek @ Stagestop sites have been monitored almost annually since 1994 due to suitability of habitat and detections of individual flycatchers.

Inventory and monitoring of willow flycatchers on non-NFS lands in the Verde Valley has been conducted by USGS, AGFD, and various contract biologists. Breeding flycatchers have been monitored at Tuzigoot bridge and Tavasci Marsh (both extirpated sites), and Superior (AKA Camp Verde site). Other sites on private land where flycatchers have been detected but not monitored include private land downstream of the Hwy 260/West Clear Creek bridge (single flycatcher detected in 1997) and three other sites along the Verde on private land between White bridge and the West Clear Creek confluence (of these, only the section 7 site has documented breeding flycatchers).

On the Coconino National Forest, the southwestern willow flycatcher is only known to occur below the Mogollon Rim, although some suitable/potential habitat occurs above the Rim. There are no known nesting willow flycatchers on the Coconino National Forest; however, individuals have been detected at various sites on NFS lands and there are known populations of nesting willow flycatchers at various sites on private land along the Verde River. Potential and suitable habitat exists along various perennial streams in the Verde Valley including, the Verde River, Sheepshead, Dry Beaver Creek, Beaver Creek, West Clear Creek, and Fossil Creek. On the Forest, migrating individuals and floater males (single singing males during the breeding season) have been detected in Sheepshead Canyon, Wet Beaver Creek, Dry Beaver Creek, and West Clear Creek.

Critical Habitat

Much of the Verde River within proposed and designated critical habitat flows through non-Forest Service land. Only 358 acres (29%) of 1,238 acres are on the Coconino National Forest.

Primary constituent elements (PCEs) for existing critical habitat and proposed critical habitat list riparian vegetation and insect prey as the two primary constituent elements. The main difference is that riparian habitat in the proposed rule is expanded from riverine systems to include lakeside, natural or manmade habitat.

Cumulative Consequences Common to All Alternatives

The Coconino shares its boundary with the Prescott and Tonto National Forest along the Verde River. Guidance in Forest Plans would add cumulatively to guidance within the Coconino NF

plan. These other forests are in various stages of the revision process, and no forest plans have yet been approved.

The Environmental Assessment and General Management Plan for the Tuzigoot and Montezuma Castle National Monuments in the Verde Valley have guidance and mitigations for the SWWF and its critical habitat (USDI National Park Service 2010). The goal is to minimize immediate and long-term impacts to threatened and endangered species. Mitigation actions include conducting surveys, site design and location of facilities to avoid adverse effects, develop and implement restoration and/or monitoring plans, implement measures to reduce adverse effects of nonnative plants and wildlife, and manage visitor use to avoid, offset and minimize potential adverse effects. Guidance in this plan would have neutral to positive cumulative effects to guidance for SWWF under any of the Forest's alternatives.

The Verde Valley Regional Land Use Plan includes Sedona, Cottonwood, Camp Verde, Clarkdale, Jerome, Cornville, Big Park and adjoining lands (Community Sciences Corporation 2006). The Coconino NF forms the north and east boundaries of the region. The area includes portions of the Verde River and several tributaries, including Sycamore Creek, Oak Creek, Beaver Creek, and West Clear Creek. The plan addresses four subcomponents: transportation, housing, open space, and land management agencies. An overriding objective is to blend the man-made environment with natural conditions as unobtrusively as possible. Open space and protection of sensitive riparian habitats are a component of the plan. The Verde Valley Regional plan would contribute to protecting and maintaining riparian habitat that is, or could be, used by the SWWF, and existing critical habitat on the Verde River.

Consequences Common to All Alternatives

All alternatives incorporate the standards and guidelines in the Verde Wild and Scenic River Comprehensive River Management Plan (CRMP) (USDA Forest Service 2004b). Wildlife is an outstandingly remarkable value (ORV), and the southwestern willow flycatcher is listed as an example. Desired conditions call for managing wildlife habitat at optimal levels. Standards require all activities to protect and enhance ORVs, and recovery actions for the SWWF should be implemented. The biological assessment for the CRMP determined that the action "May Affect, but is not likely to adversely affect" federally-listed species and critical habitat. This would apply to all alternatives considered.

Alternative A – 1987 Plan

The 2004 and 2011 Biological Assessments are included by reference for both the species and proposed critical habitat.

Determination of Effect from the 2011 Biological Assessment

Species and Habitat

The Coconino NF has a large number of Forest-wide and MA S&Gs relevant to the SWWF, and they were mixed in their prioritization and impacts. There are S&Gs that mitigate impacts to riparian systems and other Resource Programs, but some uses appear to have equal weight in planning site-specific projects that could affect SWWF habitat. One example would be in the

Lands and Minerals Program, regarding both mineral extraction and easements for roads and utility corridors. Although there is an S&G in the Lands and Minerals Program prohibiting surface occupancy where threatened and endangered species exist (S&G 384), this prohibition doesn't include suitable, unoccupied SWWF habitat or disturbance to migrant SWWF. MA S&Gs were also mixed. Direction in MA 27 included creating roads/trails for OHV use. In MA 12 (Riparian), mineral excavation is specifically allowed within riparian areas although with the caveat that riparian conditions will be maintained or improved. On the positive side, a total of ten S&Gs in MA 20 relate directly to the SWWF, including a prohibition on grazing in occupied SWWF habitat and with suitable, un-surveyed habitat treated as occupied. Lastly, there is substantial amount of designated and eligible WSR on the Coconino NF, with the direction to maintain or improve those outstandingly remarkable values for which they were recognized. It is very likely that some migrant SWWF utilize some of these river segments.

Determination of Effects (Species)

No SWWF breeding is known to occur on the Coconino NF; however, there have been migrants and floaters observed. Therefore, any potential effects associated with implementation of the LRMP are expected to be to these migrants/floaters and not to breeding birds. Livestock grazing does occur on the Forest, including within riparian habitats. However, as mentioned above, there are many areas with the potential SWWF habitat that are excluded from livestock grazing. Recreational use on the Coconino NF is considered high, and much of the recreation is dispersed, non-motorized recreation, which could include use in riparian areas. There is an S&G that provides direction to create a road network for OHV recreation in one MA. However, protection of threatened, endangered, and sensitive species and riparian resources are a factor in determining such routes. Similarly, minerals exploration is permitted within riparian areas on the Coconino NF, but there is also direction to assure that conditions remain the same or are improved through such a project. It appears that, for all of the Programs' activities that could potentially have negative impacts to migrant SWWFs, there are also S&Gs that eliminate or mitigate most of these potential impacts. Therefore, the potential effects from these activities are considered to be insignificant or discountable at the programmatic level, so the continued implementation of the Coconino NF LRMP May Affect, and is Not Likely to Adversely Affect, the SWWF."

Critical Habitat

The majority of SWWF CH in this stretch of the Verde River occurs on lands other than the Coconino NF. The non-Federal lands are the areas where adverse effects to SWWF CH are likely to occur as they do not have the restrictions and protective direction that the USFS has in place. Recreational use on these lands is considered to be high, and there are water diversions that could also negatively affect PCEs. The CH that does fall on the Coconino NF (and some adjacent to) is expected to benefit from the overall Coconino NF LRMP direction. There are currently no known major activities that are likely to occur in the reasonably foreseeable future that could contribute towards cumulative effects to CH on the Coconino NF.

The Coconino NF has quite a few Forest-wide and MA S&Gs relevant to SWWF CH, and they were somewhat mixed in their prioritization and impacts. There are several S&Gs from the various Programs that mitigate impacts to riparian systems either from within the same Program or among the other Resource Programs. Some uses did appear to have equal weight in planning site-specific projects that could affect SWWF habitat. One example would be in the Lands and Minerals Program regarding both mineral extractions. There is an S&G prohibiting surface

occupancy where threatened and endangered species exist (S&G 384); this prohibition doesn't include suitable SWWF where the species doesn't exist, which would include CH. However, S&G 505 in MA 12 (Riparian) directs that if such activities are to occur in riparian areas, then they will maintain or improve riparian conditions. There are a few instances like this, and the overall direction seems to be favorable to SWWF CH.

Determination of Effects (Critical Habitat)

There is relatively little CH on the Coconino NF, and it largely falls within two MAs (2 and 12). All of the SWWF CH on the Coconino NF is currently excluded from livestock use. The potential for any new or renewed permits associated with water diversions that would affect SWWF CH within the life of the current LRMP is low, but any such action would require in-depth analysis and compliance with NEPA and ESA. MA 2 is withdrawn from all forms of mineral entry, and MA 12 direction is such that mineral extraction may be authorized provided the appropriate environmental analysis is conducted first, and that the riparian conditions are maintained or improved. Given there is also direction to protect and give priority to threatened, endangered, and sensitive species and their habitat, it is unlikely such actions would occur in SWWF CH on the Coconino NF. The current road density is expected to decrease, mostly due to S&Gs in both MAs and the ongoing TMR effort. In addition, MA 2 has specific direction for recreation, which includes regulating the type and intensity of use in order to protect and/or enhance all of the ORVs for the river corridor, which includes the SWWF and its habitat. It is likely that some Coconino NF activities do have the potential for negative impacts to SWWF CH, but they are likely to be insignificant or discountable at the programmatic level. Therefore, it is determined that the continued implementation of the Coconino NF LRMP **May Affect, and is Not Likely to Adversely Affect** SWWF CH.”

Alternative B – Modified Proposed Plan

Environmental Consequences

Vegetation/PNVTs

Flooding is the primary disturbance within riparian, although fire in the surrounding watersheds occasionally causes incursions in riparian.

The objective for riparian forest types is to restore at least 200-500 acres of non-functioning and functioning-at-risk riparian areas within 10 years following plan approval. Projects to meet these objectives will likely occur not only within the portions of the Cottonwood Willow and Mixed Broadleaf Riparian PNVTs that could provide southwestern willow flycatcher habitat, but in other PNVTs as well. Therefore, only a relatively small amount of habitat has the potential to be improved to benefit the SWWF.

Guidelines call for establishment of streamside management zones to provide protections from management activities, to limit livestock utilization to 20% of the woody vegetation, to keep mesquite bosques unfragmented, to have three or more age classes present, and to maintain 80% of natural herbaceous vegetative cover.

Aquatic Resources – Watersheds

It is unknown at this time if any of the SWWF watersheds will be selected as priority for restoration.

Wildlife, Fish, and Botanical Resources

Guidelines include following recovery plans, minimizing disturbance impacts from fire suppression activities on listed species, implementing seasonal timing restrictions as needed, and to conserve and recover listed species. All of these guidelines would benefit the SWWF.

Invasive Exotic Species

Desired conditions and guidelines to prevent, control or eradicate invasive species would be beneficial for the SWWF. In some areas, SWWFs nest in tamarisk, and removal of this invasive species could have negative impacts on flycatchers in the short-term, until suitable habitat is reestablished. Because there are no nesting flycatchers on the Forest, activities in riparian habitats to restore native vegetation will not harm, and will likely improve long-term habitat for flycatchers.

Livestock Grazing

Desired conditions don't specifically mention riparian habitat, but call for rangeland ecosystems to be diverse, resilient, and functioning within a healthy, sustainable landscape.

Infrastructure (Roads and Facilities)

Desired conditions clearly articulate a roads and facilities program that is managed to avoid or minimize habitat and disturbance impacts to wildlife. Road guidelines provide strong sideboards that can be applied to protect SWWF and its habitat. Guidelines for road maintenance, new road construction, road relocation, and road crossings will result in avoidance or minimization of impacts. Habitats for threatened, endangered, and sensitive species that are susceptible to roads as barriers or roads that are mortality hazards are prioritized for decommissioning. Since flycatchers are not particularly susceptible to being run over and can fly to disperse, this guideline is less relevant for flycatchers than for other wildlife species.

The specific objective to naturalize or decommission 200 – 800 miles of unauthorized roads, could provide a benefit to current or future occupied CLF habitats.

Land Adjustments

See **Consequences Common among All Alternatives for Threatened and Endangered Species.**

Recreation Opportunity Spectrum

For the Cottonwood Willow Riparian PNVT, approximately 94 acres moves into less primitive ROS objectives in Alternative B compared to A (Table 13), while in the Mixed Broadleaf Riparian PNVT, 170 acres shifts to more primitive ROS classes (Table 14). Overall, Alternative B shifts 76 acres to more primitive classes for these PNVTs, which will reduce disturbance and potential habitat impacts to southwestern willow flycatchers and their habitat.

For designated and proposed critical habitat, Alternatives B, C, and D classify non-forest CH into RN and R, with 85 acres shifting from SPM to RN (Table 17). This difference between Alternative A and the other alternatives is small, but it represents about 24% of the total CH acreage (358 acres) on the Forest. Therefore, ROS objectives Alternative B would allow for more development and roads on 24% of CH.

Table 17. Acres within proposed and designated SWWF critical habitat by ROS class and alternative.

	P	SPNM	SPM	Subtotal Primitive	RN	R	U	Non-forest	Total
Alt. A	0	0	129	129	163	202	0	56	549
Alt. B, C, D	0	0	44	44	247	258	0	0	

Scenic Resources

In the desired conditions for scenic resources, properly functioning ecosystems are important components of scenic quality. This supports integration of SWWF habitats and management needs. Although some management activities could impact scenic integrity objectives (SIO) (such as fencing, stream structures, etc.) depending on the objective identified within CLF habitat, guidelines allow for site-specific consideration of construction of structures without the need to amend the forest plan.

Wilderness

See Table 16.

Determination of Consequences

Collectively, the guidance in Alternative B will contribute positively to Southwestern willow flycatcher habitat as projects are implemented under the Modified Proposed Plan. The guidance is not as strong as Alternative A, since that alternative calls for all riparian habitats to be in or trending towards satisfactory conditions by 2030. Over the last 10 years, 630 acres of riparian forest were improved (USDA Forest Service 2013b). For Alternatives B, C and D, objectives are to restore at least 200-500 acres of riparian forest over 10 years.

Alternative C

Environmental consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Wilderness: Eighteen percent (452 ac) of the Cottonwood Willow and 9% (328 ac) of the Mixed Broadleaf PNVT/vegetation type is within proposed Wilderness.
2. WHMAs. See DEIS.
3. Expanding the Cottonwood Basin Fumeroles Geological Area will have no impact on the Southwestern willow flycatcher since there is no riparian habitat within the area.

4. Recreational shooting. See DEIS.
5. Designating the Walnut Canyon management area and areas with a Recreation Opportunity Spectrum objective of “semi-primitive non-motorized” as not suitable for snowmobile use, except to provide ingress/egress for private inholdings will have no impact on Southwestern willow flycatchers.
6. RNAs.
7. Retaining the 1987 Plan standards and guidelines for old growth will have no impacts on Southwestern willow flycatchers.

Recreation Opportunity Spectrum

Compared to Alternative B, Alternative C has 38 more acres in primitive ROS classes in Cotton Willow and Mixed Broadleaf PNVTs (Tables 13 and 14), resulting in slightly less disturbance and potential habitat impacts to the SWWF.

For designated and proposed critical habitat, Alternatives B, C, and D classify non-forest CH into RN and R, with 85 acres shifting from SPM to RN (Table 17). This difference between Alternative A and the other alternatives is small, but it represents about 24% of the total CH acreage (358 acres) on the Forest. Therefore, ROS objectives Alternative B would allow for more development and roads on 24% of CH.

Determination of Consequences

The primary difference between Alternative A and B is that this alternative would recommend designation of 18% of the Cottonwood Willow PNVT and 9% of the Mixed Broadleaf Riparian PNVT as wilderness, providing additional protections for potential southwestern willow flycatcher habitat. This provides more positive direction for flycatcher habitat than Alternatives A and B.

8. Western Yellow-billed Cuckoo

Existing Condition/Affected Environment

Historically, cuckoos were widespread and locally common in Arizona (USDI Fish and Wildlife Service 2001b).

Cumulative Consequences Common to All Alternatives

The Coconino shares its boundary with the Prescott and Tonto National Forest along the Verde River. Guidance in Forest Plans would add cumulatively to guidance within the Coconino NF plan. These other forests are in various stages of the revision process, and no forest plans have yet been approved.

The Environmental Assessment and General Management Plan for the Tuzigoot and Montezuma Castle National Monuments in the Verde Valley have guidance and mitigations for the yellow-billed cuckoo (USDI National Park Service 2011). The goal is to minimize immediate and long-term impacts to threatened and endangered species. Mitigation actions include conducting

surveys, site design and location of facilities to avoid adverse effects, develop and implement restoration and/or monitoring plans, implement measures to reduce adverse effects of nonnative plants and wildlife, and manage visitor use to avoid, offset and minimize potential adverse effects. Guidance in this plan would have neutral to positive cumulative effects to guidance for the cuckoo under any of the Forest's alternatives.

The Verde Valley Regional Land Use Plan includes Sedona, Cottonwood, Camp Verde, Clarkdale, Jerome, Cornville, Big Park and adjoining lands (Community Sciences Corporation 2006). The Coconino NF forms the north and east boundaries of the region. The area includes portions of the Verde River and several tributaries, including Sycamore Creek, Oak Creek, Beaver Creek, and West Clear Creek. The plan addresses four subcomponents: transportation, housing, open space, and land management agencies. An overriding objective is to blend the man-made environment with natural conditions as unobtrusively as possible. Open space and protection of sensitive riparian habitats are a component of the plan. The Verde Valley Regional plan would contribute to protecting and maintaining riparian habitat that is, or could be, used by yellow-billed cuckoos.

Alternative A – 1987 Plan

Environmental Consequences

Although all of MA 12 is for riparian management, riparian habitat guidance is scattered throughout the 1987 Plan. In forestwide wildlife, direction ensures that riparian standards apply to all areas, even if they are too small to map. Standards and guidelines for MSO and goshawk also emphasize riparian management. Riparian habitat is identified as restricted habitat for MSO, and management is to maintain and restore healthy ecosystems and to improve degraded conditions as soon as possible. Utilization standards and guidelines for livestock grazing are to be implemented to maintain and restore riparian habitats. Similarly, goshawk guidelines also call for maintenance and restoration of healthy riparian ecosystems.

Forestwide range direction identifies riparian condition as a potentially significant issue that needs to be addressed during the environmental analysis for revising Allotment Management Plans every 10 years.

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative A *May Affect* the yellow-billed cuckoo and its habitat. Collectively, the guidance in the 1987 Plan for riparian habitats contributes positively to cuckoos by emphasizing recovery of habitat, and providing standards, guidelines, and objectives to guide improvement.

Alternative B – Modified Proposed Plan

Environmental Consequences

Guidelines call for limiting livestock utilization to 20% of the woody vegetation, to have three or more age classes present, and to maintain 80% of natural herbaceous vegetative cover.

Recreation Opportunity Spectrum

At the project-level, the desired ROS is used to determine if a project is moving toward or away from the desired ROS.

For the Cottonwood Willow Riparian PNVT, approximately 94 acres moves into less primitive ROS objectives in Alternative B compared to A (Table 13), while in the Mixed Broadleaf Riparian PNVT, 170 acres shifts to more primitive ROS classes (Table 14). Overall, Alternative B shifts 76 acres to more primitive classes for these PNVTs, which will reduce disturbance and potential habitat impacts to yellow-billed cuckoos and their habitat.

Wilderness

See Table 16.

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative B *May Affect* the yellow-billed cuckoo and its habitat. Collectively, the guidance in Alternative B will contribute positively to cuckoo habitat as projects are implemented under the Modified Proposed Plan. Although Alternative A calls for all riparian habitats to be in or trending towards satisfactory conditions by 2030, that has proven to not be realistic. Extrapolating out to 2030, this Alternative will improve 9-23% of riparian acres, but the remaining will stay in at-risk or non-functioning conditions. The rate of habitat improvement is expected to be the same for all alternatives. Guidance to keep mesquite bosques unfragmented will help protect this important habitat for cuckoos on the Forest, resulting in Alternative B direction being slightly stronger for cuckoos than Alternative A.

Alternative C

Environmental consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Wilderness: See DEIS.
2. WHMAs: See DEIS.
3. Geological Areas: See DEIS.
4. Recreational shooting: See DEIS.
5. Snowmobile use: See DEIS.
6. Because there is no Cottonwood Willow habitat present, restricting grazing in RNAs will have no impact on yellow-billed cuckoos.
7. Old growth: See DEIS.

Recreation Opportunity Spectrum

Alternative C has 38 more acres in primitive ROS classes in the Cottonwood Willow and Mixed Broadleaf PNVTs than Alternative B (Tables 13 and 14), resulting in slightly less disturbance and potential habitat impacts to the yellow-billed cuckoo.

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative C *May Affect* the yellow-billed cuckoo and its habitat. The primary difference between this alternative and Alternative B is that this alternative would recommend designation of 18% of the Cottonwood Willow PNVT as wilderness, providing additional protections for potential cuckoo habitat. This provides slightly more positive direction for cuckoo habitat than Alternative B.

Alternative D

Determination of Consequences

Considering all environmental and cumulative consequences, Alternative D *May Affect* the yellow-billed cuckoo and its habitat. Overall, consequences are very similar to Alternative B except for the proposed wildernesses in Alternative B.

9. Yuma Clapper Rail

Existing Condition/Affected Environment

The Yuma Clapper Rail lives and nests in freshwater marshes where moist to wet soil and dense vegetation, predominately bulrush and cattails, at least 40 cm (15.7 in.) in height, occurs (Todd 1986, Conway et. al 1998).

There is no known suitable habitat on NFS lands. Potential habitat (>1ac of cattails) could occur along the Verde River, especially within proximity of the area of confluence of Verde tributaries, and along Fossil Creek.

Cumulative Consequences Common to All Alternatives

The Coconino shares its boundary with the Prescott and Tonto National Forest along the Verde River. Guidance in Forest Plans would add cumulatively to guidance within the Coconino NF plan. These other forests are in various stages of the revision process, and no forest plans have yet been approved.

The Environmental Assessment and General Management Plan for the Tuzigoot and Montezuma Castle National Monuments in the Verde Valley have guidance and mitigations for the Yuma clapper rail (USDI National Park Service 2010). The goal is to minimize immediate and long-term impacts to threatened and endangered species. Mitigation actions include conducting surveys, site design and location of facilities to avoid adverse effects, develop and implement restoration and/or monitoring plans, implement measures to reduce adverse effects of nonnative plants and wildlife, and manage visitor use to avoid, offset and minimize potential adverse

effects. Guidance in this plan would have neutral to positive cumulative effects to guidance for the Yuma clapper rail under any of the Forest's alternatives.

The Verde Valley Regional Land Use Plan includes Sedona, Cottonwood, Camp Verde, Clarkdale, Jerome, Cornville, Big Park and adjoining lands (Community Sciences Corporation 2006). The Coconino NF forms the north and east boundaries of the region. The area includes portions of the Verde River and several tributaries, including Sycamore Creek, Oak Creek, Beaver Creek, and West Clear Creek. The plan addresses four subcomponents: transportation, housing, open space, and land management agencies. An overriding objective is to blend the man-made environment with natural conditions as unobtrusively as possible. Open space and protection of sensitive riparian habitats are a component of the plan. The Verde Valley Regional plan would contribute to protecting and maintaining riparian habitat that could be used by the Yuma clapper rail.

Alternative A – 1987 Plan

Environmental Consequences

Standards and guidelines call for protection of riparian from grazing, and to amend AMPs to contribute towards achievement of satisfactory riparian condition.

Although all of MA 12 is for riparian management, riparian habitat guidance is scattered throughout the 1987 Plan. In forestwide wildlife, direction ensures that riparian standards apply to all areas, even if they are too small to map. Standards and guidelines for MSO and goshawk also emphasize riparian management. Riparian habitat is identified as restricted habitat for MSO, and management is to maintain and restore healthy ecosystems and to improve degraded conditions as soon as possible. Utilization standards and guidelines for livestock grazing are to be implemented to maintain and restore riparian habitats. Similarly, goshawk guidelines also call for maintenance and restoration of healthy riparian ecosystems.

Forestwide range direction identifies riparian condition as a potentially significant issue that needs to be addressed during the environmental analysis for revising Allotment Management Plans every 10 years.

In addition to the objective to recover 80% of riparian habitats by year 2030 with the remaining 20% significantly improved, other objectives for protection and improvement of riparian habitats include construction of 10 miles of fence per decade and installation of stream habitat improvement projects in the first decade.

Determination of Consequences

Collectively, the guidance in the 1987 Plan for riparian habitats contributes positively to Yuma clapper rails by emphasizing recovery of habitat, and providing standards, guidelines, and objectives to guide improvement.

Alternative B – Modified Proposed Plan

Environmental Consequences

Guidelines call for limiting livestock utilization to 20% of the woody vegetation, to keep mesquite bosques unfragmented, to have three or more age classes present, and to maintain 80% of natural herbaceous vegetative cover.

Recreation Opportunity Spectrum

See Tables 13, 14, and 15.

Determination of Consequences

Collectively, the guidance in Alternative B will contribute positively to Yuma clapper rail habitat as projects are implemented under the Modified Proposed Plan. Although objectives are greater for the amount of riparian habitat to be treated in Alternative A, the actual rate of riparian habitat improvement is expected to be similar under all alternatives (Riparian Specialist's report 2013).

Alternative C

Environmental consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Wilderness. The acreage within proposed Wilderness represents 18% (452 ac) of the Cottonwood Willow PNV and 9% (328 ac) of the Mixed Broadleaf PNV.
2. WHMAs. There is no Cottonwood Willow Riparian in WHMAs, and only 21 acres (0.6%) of Mixed Broadleaf Riparian, making impacts to Yuma clapper rails and their habitat negligible.
3. Expanding the Cottonwood Basin Fumeroles Geological Area will have no impact on the Yuma clapper rail since there is no riparian habitat within the area.
4. There are 33.5 acres of Mixed Broadleaf Riparian in Long Valley and 295 acres in Sedona-Oak Creek. Because of the small amount of PNVs acres, and the low likelihood that suitable Yuma clapper rail habitat is present, designating Walnut Canyon, Sedona-Oak Creek, Long Valley, and parts of the Flagstaff Neighborwoods management areas as not suitable for recreational (non-hunting) shooting will have negligible consequences to Yuma clapper rails and their habitats.
5. Designating the Walnut Canyon management area and areas with a Recreation Opportunity Spectrum objective of "semi-primitive non-motorized" as not suitable for snowmobile use, except to provide ingress/egress for private inholdings will have no impact on Yuma clapper rails.
6. Only 18 acres of Mixed Broadleaf Riparian is within RNAs, therefore, restricting grazing will have negligible impacts on Yuma clapper rail habitats.

7. Retaining the 1987 Plan standards and guidelines for old growth will have no impacts on Yuma clapper rails.

Recreation Opportunity Spectrum

There is a small shift of 133 acres into more primitive ROS classes for the three PNVTs combined in Alternative C compared to Alternative B (Tables 13, 14 and 15). This will reduce disturbance and potential habitat impacts to potential Yuma clapper rail habitat to a greater degree than Alternatives A and B.

Determination of Consequences

The primary difference between Alternative A and B is that this alternative would recommend designation of 18% of the Cottonwood Willow PNVT and 9% of the Mixed Broadleaf Riparian PNVT as wilderness, providing additional protections for potential Yuma clapper rail habitat. This provides more positive direction for rail habitat than Alternative B.

Alternative D

Environmental consequences

Not adding any new wilderness areas makes this aspect of this Alternative D the same as Alternative A.

There is no cottonwood willow or wetland cienega habitat in botanical or geological areas, and only 10 acres of mixed broadleaf riparian in the Fossil Creek Botanical Area and 30 acres in the West Clear Creek Research Natural Area, therefore, allowing bicycles on designated trails in botanical and geological areas will have no appreciable effects on the Yuma clapper rail.

10. Bald and Golden Eagles

Environmental Consequences Common to All Alternatives

All projects and activities would be evaluated at the project level, and if take is likely, a permit would have to be applied for and issued by the U.S. Fish and Wildlife Service before the activity could occur.

Alternative A – 1987 Plan

Environmental Consequences

The 1987 Plan has a number of standards and guidelines relating to eagles and raptors.

The following plan guidance applies forest-wide:

- Construct raptor perch, roost, and nest structures where applicable to improve habitat. P.

- Install structures, such as gates or barriers, necessary to manage roads to limit or restrict access into key big game winter range and bald eagle nesting and wintering areas. Follow with appropriate administration and enforcement. P. 66
- Powerlines and towers are built (construction or reconstruction) to specifications compatible with raptor use. P. 80

The following applies to Ponderosa Pine Mixed Conifer Less Than 40 % Slope – Management Area 3:

- Other raptors -- An area extending to 50 feet from active nests is left uncut. P. 123
- Bald eagle winter roosts -- Protect with a 300-foot radius uncut zone around the roost. Road development should avoid the roost and uncut zone. P. 123
- In cooperation with the Arizona Game and Fish Department, develop and implement an osprey and wintering bald eagle public education program. P. 124

The following applies to Verde Valley – Management Area 11:

- Access likely to cause disturbance is prohibited in the vicinity of nesting bald eagles between December 1 and June 15 (Closure Order 16-52, October 23, 1984). If eagles occupy a nest territory earlier or later, the closure period may be lengthened or shortened. P. 167

The following applies to Sedona/Oak Creek Ecosystem Area-wide:

- Work with air tour companies and rock climbers to eliminate disturbing activities near occupied eyries during the peregrine falcon breeding season (March 1 to August 31) and to protect other raptor species. P. 206-11

The following applies to Flagstaff/Lake Mary Ecosystem Area-wide:

- Restrict human activities where active raptor nests are located. Species potentially impacted include the golden eagle, prairie falcon, Mexican spotted owl, and zone-tailed hawk. Protection distance will vary depending on the species, local topography, potential for disturbance, and breeding season for the species. P. 206-67
- Bald eagle winter roosts and perch habitat will be evaluated for long-term viability. Silvicultural methods that encourage regeneration and growth of desirable trees may be used near roost sites. Groves of trees may be maintained to provide screening for roost and perch areas. Silvicultural practices will result in the growth of large diameter trees with open crowns in multi-layered stands. Prescribed fires to improve and protect roost areas may be used with effective protection of large trees and snags. P. 206-73
- Human activities will be managed so that disturbance does not interfere with the eagles' ability to use the site. P. 206-73

The following applies to Lake Mary Watershed Management Area – MA 35:

- In the lakes, maintain the variety of waterfowl, raptors, amphibians, and many different kinds of plants adapted to lake shore environments. Emphasize healthy shorelines adjacent to the water with ample ground cover, and less erosion or compaction. Turbidity

is natural to these lakes. Minimize human disturbance to wildlife, where needed, during the critical times. Continue to provide general dispersed and water-based recreation opportunities. Improve wildlife viewing opportunities where wildlife viewing is compatible with wildlife habitat. P. 206-98

- Designated dispersed camping opportunities will be identified along the south shore of Upper Lake Mary for boat-in camping. Camping should occur in designated sites only on the south shore. Locate designated camping an appropriate distance from raptor nests. Sites will be closed, re-opened or rotated as needed for area rehabilitation. Foster good sanitation. practices and encourage boaters to pack-it-out, or if needed design sanitation facilities so as not to create sources of human waste pollution. P. 206-99-100
- Refer to more recent management guidelines and conservation assessments that exist for bald eagle winter habitat management. P. 206-100
- The designated bald eagle/osprey emphasis area should be expanded to include future perch and roost trees in key areas. P. 206-100
- Per the FLEA Area-wide direction, reduce potential for catastrophic wildfire within the Urban/Rural Influence Zone. Because of prevailing winds, lands south and west of the Urban/Rural Influence Zone should be evaluated for wildfire risks and appropriate measures taken to reduce potential for catastrophic fire. Continue partnerships with city, county, and State fire departments to coordinate fire hazard reduction treatments, prevention, and suppression. Take steps to minimize wildfire losses to key wildlife habitat components such as eagle roosts, osprey nests, snags, yellow pines, oaks and rare plant habitat. P. 206-101

While a number are related to habitat protections and improvement, there are several that serve to minimize disturbance to eagles by installing barriers to limit activity in bald eagle nesting and wintering areas, leaving 50 feet uncut around raptor nests, protecting bald eagle winter roosts with a 300-foot uncut zone, avoiding road development near roosts, prohibiting access from December 1 through June 15 to minimize disturbance to nesting eagles in the Verde Valley, and working with air tour companies and rock climbers to eliminate disturbing activities from March 1 to August 31 in the Sedona/Red Rock country. In the FLEA area, human activities are restricted where active nests are located and human activities are managed so that disturbance doesn't impact eagles' use of roost sites. In the Lake Mary Watershed, where there is currently one breeding area, and a number of winter roost sites, human disturbance to wildlife (including eagles) is minimized, camp sites around Lake Mary are an appropriate distance from raptor nests (including eagles), and the bald eagle/osprey emphasis area should be expanded to include future perch and roost trees. The guideline to refer to recent management guidelines and conservation assessments for bald eagle winter management incorporates the *Conservation Assessment and Strategy for the Bald Eagle in Arizona* (Driscoll et. al 2006), which includes guidelines to minimize disturbance to wintering eagles.

Collectively, the guidance in the 1987 Plan is fairly strong for minimization of disturbance to eagles. When applied at the project level, the likelihood of take is minimized for bald and golden eagles.

Determination of Consequences

The 1987 Plan's guidance to minimize disturbance effects is strong, so take is not likely at the project level.

Alternative B – Modified Proposed Plan

Environmental Consequences

This alternative does not have any specific desired conditions, objectives, standards or guidelines for bald or golden eagles.

The guidance for powerline construction is the same as Alternative A and will minimize the likelihood of electrocution of eagles. Seasonal restrictions on air tour companies and rock climbing activities are the same as Alternative A and will minimize disturbance to nesting eagles. The Forestwide guideline to comply with species conservation agreements and strategies ensures that the assessment and strategy for bald eagles (Driscoll et. al 2006) would be incorporated into projects. There are many items in this assessment and strategy that would minimize the potential for disturbance and take of bald eagles. The guideline for seasonal timing restrictions would apply to bald and golden eagles.

Determination of Consequences

Guidance to minimize disturbance effects is not as specific for raptors, including bald and golden eagles, as Alternative A.

Alternative C

Environmental Consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Designation of 13 new wilderness areas would reduce the potential for disturbance to nesting and wintering eagles due to limitations on recreation and management activities such as road building and timber harvest. Two of the Ladders bald eagle nests occur within the Hackberry proposed wilderness area, and all of the proposed wildernesses contain potential bald eagle roosting habitat.
2. WHMAs. The Pine Grove WHMA contains 43 acres of one known bald eagle roost plus 138 acres of the 500-foot buffer area around the roost. Potential bald eagle roosts are likely in portions of the 94,674 acres of ponderosa pine habitat in WHMAs (Table 18).

Table 18. PNVT acres within Wildlife Habitat Management Areas (WHMAs).

PNVT	Total Acres in WHMAs	Total PNVT Acres	Percent of Total PNVT
Gallery Coniferous Riparian	182	200	91.00%
Great Basin Grassland	59,633	92,913	64.18%
Mixed Broadleaf Riparian	21	3,612	0.58%
Mixed Conifer with Aspen	24	37,083	0.06%
Mixed Conifer with Frequent Fire	20,829	49,619	41.98%
Montane Subalpine Grassland	1,745	23,429	7.45%
Montane Willow Riparian	1,142	3,829	29.83%
Pinyon Juniper Grassland	130,474	261,432	49.91%
Pinyon Juniper Woodland	22,559	75,393	29.92%
Ponderosa Pine	94,674	791,897	11.96%
Water	1,252	3,176	39.40%
Wetland Cienega	2,860	9,879	28.95%
Total WHMA Acres:	335,395		

3. Expanding the Cottonwood Basin Fumeroles Geological Area will have little or no impact on eagles. The expanded Botanical/Geological area would contain 1,324 acres of semi-desert grassland and 499 acres of desert communities. Management emphasis is on protecting the plant communities and geology. The area does not contain nesting habitat for either species. Eagles could use the area for foraging, but the expansion is not expected to change foraging opportunities.
4. Recreational shooting. See DEIS.
5. Designating the Walnut Canyon management area and areas with a Recreation Opportunity Spectrum objective of “semi-primitive non-motorized” as not suitable for snowmobile use, except to provide ingress/egress for private inholdings will have a small positive impact on wintering bald eagles that may use the 18,119 acres of ponderosa pine habitat for roosting, or the 14 acres of wetland/cienega for foraging.
6. Restricting grazing in Research Natural Areas until grazing supports or would not affect the research purpose of that Research Natural Area will not have any impacts on eagles.
7. Retaining the standards and guidelines from the 1987 Forest Plan relating to old growth could benefit bald eagle roosting habitat, but would not change any impacts from disturbance on eagles.

Determination of Consequences

The designation of new wildernesses and WHMAs does more to reduce the likelihood of take of eagles as compared to Alternative B. This alternative has some guidance to be applied at the project level for minimization of disturbance. Each project will be evaluated at the site specific level, and will require a take permit from the U.S. Fish and Wildlife Service if take is likely.

Considering all environmental and cumulative consequences that apply to Alternative B, plus the differences analyzed above, this alternative could result in take, as defined in the Eagle Act, for bald or golden eagles on the Forest. The Alternative provides stronger and more positive guidance than Alternative B, and is fairly similar to Alternative A.

Management Indicator Species

The 1982 Planning Rule directs that fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. The planning area is defined as the National Forest. Each alternative must establish objectives for the maintenance and improvement of habitat for MIS.

Forest Service Manual (FSM) direction in provides additional guidance for MIS (FSM 2620). MIS are defined as:

- Any species, group of species, or species habitat element selected to focus management attention for the purpose of resource protection, population recovery, maintenance of population viability, or ecosystem diversity (FSM 2605).
- Plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent (FSM 2620.5).

FSM 2620 also defines Ecological Indicators (EI) as:

- A plant or animal whose population dynamics reflect significant changes in the conditions or productivity of an ecosystem (FSM 2605).
- Plant and animal species, communities, or special habitats with a narrow range of ecological tolerance. Such indicators are selected for emphasis and monitored during forest plan implementation because their presence and relative abundance serve as a barometer of ecological conditions within a management unit (FSM 2620.5).

Using the direction in the 1982 Planning Rule and the Forest Service Manual, the Washington Office and the Southwestern Regional Office developed two guidance documents to help forests in selection of MIS. The Forest used the Region 3 paper (Hayward et al. 2010) as the overall guidance for the process. For selection, Hayward and others (2010) identified 5 key principles to follow:

1. Choose MIS to reflect major management issues and challenges.
2. Choose MIS to facilitate evaluation of the consequences of land management activities.
3. Consider MIS for which population data is readily available, or those chosen on neighboring planning units.
4. Consider whether MIS is the best approach to the management problem. Alternatives include vegetation structure and composition, Management Indicators, or Ecological Indicators.
5. Choose an adequate but limited number of species representing the collection of indicators necessary to effectively monitor the forest plan.

Guidance provided in the Washington Office paper *Best Practices for Selecting and Using Management Indicator Species* (Owen 2010), gave examples of good and bad MIS candidates.

Examples given of good candidates are:

1. Species that are relatively common but have high fidelity to specific vegetation types.

2. Species that demonstrate a strong and/or predictable response to management activities.
3. Species involved in existing monitoring programs.
4. Species that are monitored by other entities.

Examples of bad candidates are:

1. Species for which monitoring protocols do not exist.
2. Species that exhibit variable responses to management activities.
3. Species that are difficult to detect.
4. Species with life histories that result in high inter-annual abundance.
5. Species that are very rare.
6. Species whose populations are constrained or influenced by factors for which we cannot account.

In addition, direction in FSM 2621 calls for involving state wildlife and fish agencies, other Federal agencies, and appropriate experts from universities and private organizations; selecting Federally-listed, Forest Service Sensitive species, and species that are in demand for recreational, commercial, or subsistence use. Indicators representing special habitats, habitat components, or communities should be considered.

Internal and external input was received to develop a list of potential MIS species, including Coconino National Forest wildlife and fish biologists, botanists, and watershed specialists, as well as biologists from the Arizona Game and Fish Department (AGFD) and the U.S. Fish and Wildlife Service. Research biologists from the University of Montana, AGFD, and the Rocky Mountain Research Station were asked for input. In addition, draft MIS/EI lists were reviewed from the Apache-Sitgreaves, Coronado, Kaibab, and Prescott National Forests to see where opportunities to have species in common might occur.

As a result, a list of potential MIS and EI species was developed (Tables 19 and 20) and presented to the Forest Supervisor for selection of indicators to carry forward in the Forest Plan revision process.

Table 19. Management Indicator Species Considered for Selection.

Species	PNVT	Key Habitat	Monitoring	Notes
Pronghorn	<ul style="list-style-type: none"> • Great Basin Grassland • Montane Subalpine Grassland • Semi-desert Grassland 	Diverse composition of grass and forbs; fawn hiding cover.	<ul style="list-style-type: none"> • Ongoing Arizona Game and Fish Department (AGFD) population monitoring 	<ul style="list-style-type: none"> • Selected by the Kaibab and Prescott NFs, so good candidate to evaluate habitat connectivity.
Canyon Towhee	<ul style="list-style-type: none"> • Semi-desert Grassland 	Grassland with scattered, dense shrubs.	<ul style="list-style-type: none"> • Ongoing Rocky Mountain Bird Observatory monitoring; have robust density and occupancy information. 	<ul style="list-style-type: none"> • Strongly associated with semi-desert grassland on the Forest; SDG is highly departed from vegetation and soil reference conditions.

Species	PNVT	Key Habitat	Monitoring	Notes
Mexican Spotted Owl	<ul style="list-style-type: none"> Mixed Conifer with Aspen Mixed Conifer Frequent Fire Ponderosa Pine (Gambel Oak subtype) 	Mature/old-growth mixed conifer and pine-oak habitat.	<ul style="list-style-type: none"> Ongoing inventory and monitoring in place. Revised Recovery Plan (2012) requires occupancy monitoring 	<ul style="list-style-type: none"> Very strongly tied to these habitats. Restoration focus in PIPO and dry mixed conifer. The Forest contains the majority of pine oak habitat in the EMU; mixed conifer habitat of greater importance in AZ due to Wallow fire on the Apache-Sitgreaves NF.
Orange-crowned Warbler	<ul style="list-style-type: none"> Mixed Conifer with Aspen Mixed Conifer Frequent Fire 	Mixed conifer habitat with significant deciduous component (aspen, maple, locust, willows, and alder).	<ul style="list-style-type: none"> Ongoing Rocky Mountain Bird Observatory monitoring; have occupancy information. Ongoing long-term research by University of Montana. 	<ul style="list-style-type: none"> Restoration focus in dry mixed conifer
Abert's Squirrel	<ul style="list-style-type: none"> Ponderosa Pine 	Groups of ponderosa pine trees with interlocking canopies.	<ul style="list-style-type: none"> Ongoing AGFD monitoring 	<ul style="list-style-type: none"> Recommended by AGFD and FWS Restoration focus in PIPO and dry mixed conifer.
Pygmy Nuthatch	<ul style="list-style-type: none"> Ponderosa Pine 	Mature ponderosa pine forests and snags.	<ul style="list-style-type: none"> Ongoing Rocky Mountain Bird Observatory monitoring; have robust density and occupancy estimates. 	<ul style="list-style-type: none"> Restoration focus in PIPO and dry mixed conifer.
Species group: Lucy's Warbler, Yellow warbler, Summer Tanager	<ul style="list-style-type: none"> Cottonwood Willow Riparian Mixed Broadleaf Riparian 	Mesquite bosques adjacent to cottonwood willow. Multiple age class distribution in both PNVTs with minimal tamarisk.	<ul style="list-style-type: none"> Ongoing AGFD Riparian monitoring. Rocky Mountain Bird Observatory monitoring may contribute. 	<ul style="list-style-type: none"> Lucy's warbler for mesquite bosques adjacent to riparian. Yellow warbler good for cottonwood willow up into mixed broadleaf and avoids tamarisk. Summer tanager needs tall trees within cottonwood willow and up into mixed broadleaf.

Table 20. Ecological Indicators Considered for Selection.

Species	PNVT	Monitoring	Notes
Bebb's Willow and/or Narrowleaf Cottonwood	<ul style="list-style-type: none"> Montane Willow Riparian 	<ul style="list-style-type: none"> Proper Functioning Condition Assessments Remote sensing data 	The woody vegetation component of this PNVT has declined or been lost and need restoration. Monitoring will track presence and recruitment.
Bigtooth Maple	<ul style="list-style-type: none"> Snowmelt drainages within mixed conifer frequent fire 	<ul style="list-style-type: none"> Proper Functioning Condition Assessments Remote sensing data 	Unique and important component that is declining. Monitoring will track presence and recruitment.
Aspen	<ul style="list-style-type: none"> Inclusions within mixed conifer, ponderosa pine, and some riparian 	<ul style="list-style-type: none"> Proper Functioning Condition Assessments Remote sensing data Regional Forest Health Aspen Monitoring Flagstaff District volunteer monitoring 	Unique and important component that is declining. Monitoring will track presence and recruitment.
Large snags	<ul style="list-style-type: none"> All Forested and Woodland types 	<ul style="list-style-type: none"> Stand exams FIA data Research findings (e.g. Ganey and Vojta) 	Vital component for many wildlife species.

The following analysis relies extensively from analyses done for fire and vegetation (see DEIS).

1. Pronghorn Antelope

Alternative C

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Wilderness. Designation as wilderness would limit management tools primarily to naturally ignited fire.
2. While Montane/Subalpine grassland acreage in WHMAs is only 7.5% of the PNVT, 64.2% of the Great Basin Grassland in WHMAs.

Summary of Trends by Alternative for Pronghorn

Forest Plan guidance that emphasizes pronghorn habitat and populations is broadest and strongest in Alternative A. Although the amount of past habitat improvement treatments under the 1987 Plan is not known, there has been an emphasis on habitat improvement on Anderson Mesa within Great Basin Grasslands due to the declining population trends noted in the early 2000's (USDA Forest Service 2002). Since that time, forestwide pronghorn populations have increased, and the trend is now stable (USDA Forest Service 2013c). Grassland habitat trend on the forest has not

improved from 2002 to the present, likely due to insufficient treatments in habitat. Because Alternative A does not specify quantitative objectives for grasslands habitat, the amount of projected habitat improvement is unknown.

Objectives for Alternatives B, C, and D call for the same amount of treatment within indicator habitat (32,850-40,950 acres). Forest Plan guidance for pronghorn and their habitat varies slightly among alternatives, but not enough to change trends. For all alternatives, the population trend is stable, and the habitat trend is stable to increasing.

2. Pygmy Nuthatch

Summary of Indicator Habitat for All Alternatives

The number of large snags per acre will stay essentially the same within 15 years of plan implementation (1.4 per acre) for all alternatives compared to existing conditions (1.3 per acre) (Table 126 in the DEIS).

Compared to existing condition, the overall amount of old growth decreases slightly (approximately 0.3%) under Alternative A (Table 126 in DEIS). While the very large tree component increases by 4.9% under Alternative A, the medium tree class acreage decreases 5.2%. The overall amount of old growth under Alternatives B, C, and D increases slightly (0.6%) from existing conditions, with most of the gain in the very large tree component (Table 126 in DEIS). The very large/old tree component increases 3% more under Alternatives B, C and D compared to Alternative A.

Within ponderosa pine old growth, the number of large snags per acre is the same among all alternatives (2.7 per acre), and is greater than the overall average for the PNVT (1.4 per acre) (Table 127 in DEIS).

Within the PNVT as a whole, the number of large snags per acre will increase from existing condition within 15 years of implementation under all alternatives, but the number does not differ among alternatives.

Alternative C - Environmental consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. Wilderness. See DEIS.
2. Given the emphasis on protection and management to benefit wildlife, the designation of WHMAs could positively impact pygmy nuthatches and their habitats.

3. Mexican Spotted Owl

Existing Condition/Affected Environment

Ponderosa Pine

Within the Ponderosa Pine PNVT, the portion estimated to be the pine-oak subtype is 40%, or 316,759 acres. In order to be classified as the Gambel oak subtype, the Forest Service's definition requires Gambel oak to be well represented (>5% cover), and all size oaks contribute to meeting the 5% cover requirement. Pine-Gambel oak habitat is defined in the owl's recovery plan as being within the ponderosa pine series, reflecting a Gambel oak or a Gambel oak phase of the habitat type, where >10% of the stand BA or 4.6 m²/ha (20 ft²/ac) of BA consists of Gambel oak >13 cm (5 in) in diameter at root collar (USDI Fish and Wildlife Service 2012b). Therefore, pine-oak meeting the recovery plan definition would be a subset of the pine-oak PNVT acreage estimate (316,759), but the specific acreage is not known. The location and amount will be determined at the project-specific level as the revised forest plan is implemented.

Migratory Birds

Existing Condition/Affected Environment

Spruce-Fir

Golden-crowned Kinglet

These kinglets occur in mature spruce fir forests with closed canopies. They occur at edges of clearings.

Pine Grosbeak

Pine grosbeaks occur in spruce-fir forests where a mosaic of open areas, disturbed areas, and edges occur. They occur in the upper canopy where they feed on seeds, cones, and buds of cone-producing trees.

Swainson's Thrush

The Swainson's thrush occurs in dense spruce fir where forest openings occur. They prefer edges that have dense ground and understory vegetation. They nest in shrubs or low in coniferous trees.

Three-toed Woodpecker

These woodpeckers prefer spruce-fir forests, but can also take advantage of high populations of bark beetles and other boring insects following disease or fire in ponderosa pine and Douglas-fir forests. Conifer snags are used for feeding, nesting, roosting, and perching.

Mixed Conifer

Olive-sided Flycatcher

Olive-sided flycatchers prefer coniferous forests with tall trees and snags. They prefer forest openings and edges and are more common in open to semi-open forest stands than in closed canopy forests.

Ponderosa Pine

Cordilleran Flycatcher

Cordilleran flycatchers are considered a common summer resident and uncommon transient (Morrall and Coons 1996). They are associated with snags and high overstory canopy closure. Stands of old growth ponderosa pine and closed canopy forest within the project area occur in small patches, on steep slopes, or in pine stringers in small drainages. Cordilleran flycatchers are considered to be on the increase, but at risk due to concerns about loss of suitable habitat and habitat components such as snags, downed logs, and loss of closed canopy. Within the project area, it is expected that this species is static to increasing.

Flammulated Owl

These owls nest in old growth coniferous forests including ponderosa pine, pine/oak, and mixed conifer, where they nest in natural cavities of live trees, snags, and dead limbs or abandoned cavities of flickers and sapsuckers. Flammulated owls arrive mid-April, with breeding occurring into July. Migration south occurs from August through October.

Grace's Warbler

Grace's warblers prefer open, park-like stands generally dominated by ponderosa pine. These warblers place their compact, cups-like nests well away from the trunk in the cluster of needles at the end of branches.

Lewis' Woodpecker

Lewis' woodpeckers are found in open ponderosa pine (including pine/oak) forests and riparian woodlands from about 6,200 to 8,900 feet in elevation. They use brushy understories, snags for perching, and open areas for foraging; all of which is frequently provided in burn areas. They nest in the abandoned cavities of other woodpeckers, in natural cavities, or make their own cavities. They nest most frequently in ponderosa pine or cottonwood trees. While most Lewis' woodpeckers are resident some migrate to lower elevations.

Olive Warbler

Distribution of olive warblers in the state extends along the Mogollon rim but they also occur in south eastern Arizona. Olive warblers are found primarily in open ponderosa pine forests, including those forests with a Gambel oak component. They are also found regularly in mixed-conifer forests. In southeastern Arizona, they occur in madrean pine-oak forests characterized by an overstory of ponderosa pine with an understory of several species of evergreen oaks and alligator juniper. Sub-communities of madrean pine-oak occur on the Forest within pinyon-juniper evergreen shrub, for example, in Oak Creek Canyon and Towel Creek. The migratory birds arrive in March to nest and have been heard singing through July. Cup nests are built in conifers. These birds have been document hosts for brown-headed cowbirds in Arizona. This species was detected on the Coconino during the Breeding Bird surveys.

Purple Martin

Purple martins are an uncommon summer resident in ponderosa pine (Morrall and Coons, 1996). This species has been nearly extirpated from ponderosa pine forests since fire suppression has resulted in much denser conditions and logging has reduced the number of snags and large old trees.

High Elevation Grassland (Montane/Subalpine Grassland and Great Basin Grassland)

Grasshopper Sparrow

These sparrows nest in grassland habitats, primarily in southeast Arizona, but are rare transients/migrants on the Coconino.

Swainson's Hawk

These hawks occur in large expanses of open grasslands that may have interspersed shrubs and trees. They have not been documented nesting on the Forest, but can occur as a transient/migrant. They eat a wide variety of items; insects, reptiles, birds, and small mammals.

Pinyon Juniper

Black-throated Gray Warbler

Phillips et al. (1964) described black-throated gray warblers as common summer residents in pinyon pine-juniper woodlands. This species favors open woodlands and is commonly encountered nesting in pinyon pine-juniper woodlands. This species is encountered much more frequently in tall stands with a higher density of mature pinyon pine. During Arizona Breeding Bird Atlas surveys, they were frequently absent in drier stands primarily composed of juniper (Corman and Wise-Gervais 2005). This species is thought to be stable or slightly increasing in Arizona.

Gray Flycatcher

Gray flycatchers primarily occupy pinyon pine and juniper, or ponderosa pine with an open overstory. These birds may need some ground cover to support insect populations for foraging. Larger taller stands of sagebrush and greasewood are also used.

Gray Vireo

Gray vireos breed in open and mature juniper woodlands where there is an understory of broadleaf shrubs. They are insectivorous during the breeding season and frugivorous during the winter. They nest low in a small tree or shrub and are known hosts to brown-headed cowbirds.

Pinyon Jay

As the name suggests, pinyon jays are strongly associated with pinyon pines, eating and caching seeds for future use. These social jays are colonial nesters, with 25 or more pairs nesting in one stand. They place their nest in ponderosa pine, pinyon, and juniper trees.

Sage Sparrow

While the Breeding Bird Atlas shows this species as nesting in the north and northeastern portion of the state, Northern Arizona Audubon Society shows this species as a common summer resident and fairly common winter resident in the desert areas of the Verde Valley. In the summer, they occur in desert and semi-desert grasslands. In the winter, they also occur in pinyon-juniper, chaparral, and mid-elevation grasslands.

Chaparral

Black-chinned Sparrow

This sparrow occurs on arid hillsides with brushy chaparral vegetation.

Sage Sparrow

While the Breeding Bird Atlas shows this species as nesting in the north and northeastern portion of the state, Northern Arizona Audubon Society shows this species as a common summer resident

and fairly common winter resident in the desert areas of the Verde Valley. In the summer, they occur in desert and semi-desert grasslands. In the winter, they also occur in pinyon-juniper, chaparral, and mid-elevation grasslands.

Virginia's Warbler

This warbler nests in dense brush on arid chaparral slopes.

High Elevation Riparian (Montane Willow and Mixed Broadleaf)

McGillivray's Warbler

This warbler occurs in patches of dense and brushy deciduous riparian areas at higher elevations.

Red-faced Warbler

This warbler occurs in high elevation riparian areas, usually shaded canyons, where mixed conifer forests occur in the uplands.

Low Elevation Riparian

Bell's Vireo

Bell's Vireos occupy dense riparian thickets as well as mesquite and oak thickets near water. The decline in the Bell's vireo population is largely due to brood parasitism by the brown-headed cowbird. They arrive in March, nest through the summer, and begin fall migration in early September. They build small cup nests, primarily in mesquite, that hang from the fork of low branches.

Elf Owl

The range of elf owls in Arizona is below the Mogollon Rim. Elf owls nest mainly in open Sonoran desert scrub in the Sonoran desert, but may occur on the Coconino in desert scrub habitats and the canyon bottoms dominated by sycamores. They have been documented breeding in Oak Creek canyon. They arrive at higher elevation sites in mid-April, nest mainly in May and June but can have fledglings through mid-August. Migration occurs in late August and September. They nest in natural and abandoned woodpecker holes. On the Coconino, they could nest in mesquite, cottonwood, willow, sycamore, walnut, cypress, and evergreen oak.

Desert Communities and Semi-Desert Grasslands

Bendire's Thrasher

This thrasher is found across the state in open habitat from brushy grasslands with scattered mesquite and yucca, to desert scrub, and even rural areas. Breeding birds were detected in the Verde Valley. In the south and central portions of Arizona, this species is a resident and much more abundant than in northern Arizona. They arrive in the north around March to April and nest mainly in mid-June, although nesting is possible later into the monsoon period. Thrashers build stick nests in shrubs, trees, and cacti.

Sage Sparrow

While the Breeding Bird Atlas shows this species as nesting in the north and northeastern portion of the state, Northern Arizona Audubon Society shows this species as a common summer resident and fairly common winter resident in the desert areas of the Verde Valley. In the summer, they occur in desert and semi-desert grasslands. In the winter, they also occur in pinyon-juniper, chaparral, and mid-elevation grasslands.

Environmental Consequences

Cumulative Consequences Common to All Alternatives

Because migratory birds spend a good portion of the year in migration and on their wintering grounds, activities that degrade stopover or wintering habitats can have a big effect on the food and cover requirements for these birds. Similarly, on breeding grounds, activities on non-Forest Service lands can also degrade habitats and disturb birds. For example, water diversions reduce the amount of water available to support nesting, migratory stopover, or wintering habitats.

Alternative A – 1987 Plan

A number of forestwide wildlife and fish standards and guidelines apply generally to migratory birds, including guidance to inventory and evaluate wildlife habitat, improve vegetative conditions for browse species desirable to wildlife and to construct perch, roost and nest structures (pages 64-66).

In the 1987 Plan, the monitoring plan includes the following for migratory birds:

“Monitor high-use recreation areas for impacts on threatened, endangered, and sensitive species and their habitat, especially neotropical migratory birds. Take appropriate actions to minimize impacts, such as seasonal closures, area closures, signs, and interpretation.” P. 242-30.

This will ensure that the effects of intense recreational use are minimized when migratory birds are being impacted.

In general, the guidance in the 1987 Plan provides limited specific direction for migratory birds. Habitat management is indirectly addressed through guidance for the different habitat types as addressed in the following sections.

Spruce-Fir

Management activities are minimal in this vegetation type and there is not a specific MA in the 1987 Plan to guide management activities. Some guidance is contained in forest-wide direction, including standards and guidelines regarding northern goshawk management that could benefit migratory birds. This guidance calls for, among other things, uneven-age stand condition, managing for as much old forest structure as possible, maintaining a sustainable distribution of VSS classes, snags, reserve tress, downed logs (Pages 65-7 to 65-11).

Although not extensive, guidance in the 1987 plan for spruce-fir supports habitat needs for migratory birds through implementation at the project level. Guidance for maintaining 60%+ canopy closure in mature forests and old growth will benefit golden crowned kinglets. Guidance for sustaining a mosaic of overstory and understory vegetation densities and nonuniform spacing

and clumpiness contributes positively to pine grosbeak and Swainson's thrush habitat needs. Managing to retain snags will benefit three-toed woodpeckers.

Mixed Conifer

Management for mixed conifer habitats is contained primarily in direction for MA 3 and MA 4. Management emphases are on a combination of multiple uses, includes wildlife habitat. Standards and guidelines provide for maintenance of stand diversity through Integrated Stand Management. Snag and old growth management is emphasized. Snags are defined as a tree greater than 12 inches dbh and 15 feet tall. Snag s&g's call for a minimum of 200 snags per 100 acres on 50% of forested lands within 10K blocks.

Stand diversity requirements and snag management guidance in MA 3 and 4 will contribute positively to olive-sided flycatcher habitat preferences for the presence of tall trees and snags, and openings and edges within mixed conifer forests. Additionally, as with spruce-fir forests described above, forestwide standards and guidelines for the northern goshawk also apply to the mixed conifer forest. Guidance for a diversity of age classes and canopy closures, and management for snags and openings will also contribute positively to olive-sided flycatcher habitat needs.

Ponderosa Pine

Management for ponderosa pine is contained primarily in direction for MA 3 and MA 4, and forestwide direction for the Mexican spotted owl (MSO) and northern goshawk. In forestwide direction, MSO protected habitat standards and guidelines generally promote higher density and closed canopy forest conditions, with small openings, and management for large snags and downed logs. Guidance for management within restricted habitat calls for managing a portion to provide future MSO nesting and roosting habitat. Other forest and woodland habitats are managed for landscape diversity with natural disturbance and variation in stand conditions, while retaining snags and large trees. As described in the spruce-fir section, forestwide standards and guidelines for the northern goshawk also apply to the ponderosa pine forest. At least 20% of each forested ecosystem management area is allocated for old growth, and guidelines call for striving to create or sustain as much old-growth as possible over time and at multiple scales.

In MA 3 and 4, management emphases are on a combination of multiple uses, includes wildlife habitat. Standards and guidelines provide for maintenance of stand diversity through Integrated Stand Management. Snag and old growth management is emphasized. Snags are defined as a tree greater than 12 inches dbh and 15 feet tall. Snag s&g's call for a minimum of 200 snags per 100 acres on 50% of forested lands within 10K blocks.

Priority migratory birds require open canopy structure (Grace's warbler, Lewis' woodpecker, olive warbler, and purple martin) and closed forests (Cordilleran flycatcher). Old growth is important for flammulated owls. Forestwide and MA 3 and 4 guidance provide a diversity of open and closed stand conditions, maintenance and recruitment of snags and old growth conditions. Therefore, applying the guidance within the 1987 Plan at the project levels will support habitat needs required by priority ponderosa pine migratory birds.

Additionally, breeding season restrictions on some management and recreational activities for MSOs and goshawks will provide reduced disturbance to migratory birds.

High Elevation Grassland (Montane/Subalpine Grassland and Great Basin Grassland)

Direction for management of grasslands is contained primarily in MA 9 (Mountain Grassland), MA 10 (Grassland and Sparse Pinyon-Juniper above the Rim), and MA 11 (Verde Valley). Wildlife habitat is a management emphasis for all three MAs. Guidance calls for improvement of meadow and grassland habitats using a variety of methods, including conifer removal, gully stabilization, reseeding, fencing, and prescribed burning.

Although neither of the priority bird species nest on the Forest, the 1987 Plan provides for improvement and management of grassland habitats that will provide habitat for these transient/migrant species.

Pinyon Juniper

Management for pinyon juniper is contained primarily in direction for MA 7 and 8. In forestwide direction, MSO guidance for other forest and woodland types applies to pinyon juniper, as does woodland management guidance for goshawk nest areas, post-fledging family areas (PFAs), and areas outside of PFAs.

In the 1987 Plan, management of wildlife habitat is identified as a key emphasis in MA 7 and 8. Old-growth is provided on slopes greater than 15%, with stand sizes ranging from 100-300 acres. Stand diversity is established and maintained through integrated stand management to provide suitable habitat for wildlife.

Forestwide guidance for MSO in other forest and woodland types (including pinyon juniper) calls for managing for landscape diversity, retaining snags and large trees, and retention of existing old-growth. Within goshawk nest stands and PFAs, woodlands are managed to maintain existing canopy levels. Outside of PFAs, woodlands are managed for uneven aged conditions to sustain a mosaic of vegetation densities, age classes, and species composition across the landscape. Reserve trees, snags, and downed woody debris are provided for.

Priority species (black-throated gray warbler, gray flycatcher, gray vireo, pinyon jay, and sage sparrow) need mature or old-growth stands, generally open, with good ground cover and a shrub component. Mature pinyon trees provide the seeds necessary for pinyon jays. Collectively, the guidance in the 1987 Plan for pinyon juniper generally contributes positively to migratory bird habitat by emphasizing maintenance of diverse conditions with old growth and snags, providing key habitats for migratory birds.

Chaparral

There is no specific guidance for management of chaparral in the 1987 Plan. It is mentioned as a habitat component in some wildernesses and in MA 11, Verde Valley. Little active management occurs in chaparral, and if a person-caused or natural ignition starts a fire, it tends to be stand replacing.

Although there is no specific guidance, the lack of management activities in chaparral results in little impacts, plus or minus, to Virginia's warblers and black-chinned and sage sparrows and their habitat.

High Elevation (Montane Willow and Mixed Broadleaf) and Low Elevation (Cottonwood Willow) Riparian

Management guidance for riparian habitat is primarily contained with MA 12. Management of wildlife habitat is a key emphasis. The goal in the 1987 Plan is to recover 80% of riparian habitats by year 2030 with the remaining 20% significantly improved. There are multiple standards for maintaining overstory, three age classes of woody vegetation, stream shading, etc. In high elevation habitats, at least 80% of the potential shrub cover is to be maintained. Standards and guidelines call for protection of riparian from grazing.

Although all of MA 12 is for riparian management, riparian habitat guidance is scattered throughout the 1987 Plan. In forestwide wildlife, direction ensures that riparian standards apply to all areas, even if they are too small to map. S&g's for MSO and goshawk also emphasize riparian management. Riparian habitat is identified as restricted habitat for MSO, and management is to maintain and restore healthy ecosystems and to improve degraded conditions as soon as possible. Utilization standards and guidelines for livestock grazing are to be implemented to maintain and restore riparian habitats. Similarly, goshawk guidelines also call for maintenance and restoration of healthy riparian ecosystems.

Forestwide range direction identifies riparian condition as a potentially significant issue that needs to be addressed during the environmental analysis for revising Allotment Management Plans every 10 years. Salt is not to be placed within ¼ mile of riparian habitats to avoid concentration of livestock. Range forage improvement calls for establishing woody riparian vegetation and to protect from livestock grazing through management and/or fencing to allow for establishment and eliminate overuse.

In addition to the recovery objectives, other objectives for protection and improvement of riparian habitats include construction of 10 miles of fence per decade and installation of stream habitat improvement projects in the first decade. These objectives have been met, and riparian habitat improvement projects continue to be implemented.

Collectively, the guidance in the 1987 Plan for riparian habitats contributes positively to migratory birds by emphasizing recovery of habitat, and providing standards, guidelines, and objectives to guide improvement.

Desert Communities and Semi-Desert Grasslands

Management guidance for these habitats is contained primarily in MA 11, Verde Valley. Management emphases are watershed condition, range management, wildlife habitat for upland game birds, and dispersed recreation.

Guidance for range forage improvement allow for vegetative treatments where overstories include mesquite, catclaw, Canotia, manzanita, and turbinella oak with the objective to convert to a lower successional and more productive state.

Essentially, there is no mention of providing for the brushy grassland states that Bendire's thrasher and sage sparrows use. Guidance is lacking in the 1987 Plan to protect and enhance habitats for these migratory species.

Determination of Effects

Except for migratory bird habitat in desert communities and semi-desert grasslands, guidance in the 1987 Plan considers migratory birds and their habitats, and provides direction from

improvement of habitats. Unintentional take could occur from management activities that destroy nests or kill individual birds.

Alternative B

Environmental consequences

There are no specific goals, objectives, standards, or guidelines for migratory birds in the Modified Proposed Plan. However, there is general wildlife guidance that would apply to migratory birds.

The objective to restore/enhance at least 60,000 acres of terrestrial wildlife habitat during each 10-year period can be applied to migratory bird habitat.

In general, the guidance in the Modified Proposed Plan provides limited specific direction for migratory birds. Habitat management is indirectly addressed through guidance for the different habitat types as addressed in the following sections.

Vegetation/PNVTs

Spruce Fir

Desired conditions for spruce fir describe a diverse, functioning, multi-aged, mosaic of conditions that are resilient to disturbances and climate variability. Tree canopy is more closed than in mixed conifer forests. Old growth is well distributed, and large snags and downed logs are present. Disturbance events create openings at the 100-1,000 acre scale. Natural openings and meadows are well-distributed at the fine scale (10 acres or less).

The guideline for spruce fir states that soil and vegetation disturbances from management activities should occur in confined, localized areas to minimize impacts.

Management activities are minimal in this vegetation type and there are no specific objectives to implement during the life of the plan for this alternative.

Guidance in this alternative for migratory birds in spruce fir habitat is fairly general, but describes a variety of vegetative conditions that should provide the diversity of habitats needed by the four priority migratory bird species. Guidance for maintaining relatively high canopy closure in mature forests and for old growth will benefit golden crowned kinglets. Guidance for sustaining a mosaic of vegetation densities and clumpiness contributes positively to pine grosbeak and Swainson's thrush habitat needs. Managing to retain large snags will benefit three-toed woodpeckers. Alternative B provides similar guidance and protections for spruce fir migratory birds as Alternative A.

Mixed Conifer (Mixed Conifer with Aspen (MCA) and Mixed Conifer with Frequent Fire (MCF))

Desired conditions describe a mosaic of forest conditions, with old growth well-distributed throughout. Snags and downed logs are numerous. Composition, structure and function are resilient to disturbances and climate variability. MCF is more open than MCA.

Objectives for MCFE are to burn (low severity only) 8,000 acres within 10 years of plan approval and to use naturally ignited fire to treat an additional 7,500 acres. This will result in 18% of the total mixed conifer acreage being treated over 10 years.

Guidelines for mixed conifer are to protect and develop old growth and to protect primary caches of red squirrels.

Collectively, desired conditions, objectives, and guidelines provide for the habitat needed by olive-sided flycatchers. Tall trees and snags will be provided through protection and promotion of old growth, and openings and edge habitats through implementation of desired conditions and burning objectives. Alternative B provides fairly similar guidance and protections for mixed conifer migratory birds as Alternative A.

Ponderosa Pine

Desired conditions for ponderosa pine describe a landscape that has a variety of age and structural classes, that is generally uneven-aged and open, and have well-distributed old growth. Forest arrangement is in individual trees, small clumps, and groups of trees interspersed with openings that range from 10-70% of the landscape. Size of tree groups averages 0.5 acres and may be larger in areas managed for bald eagles and MSOs. Tree density ranges from 20 to 80 square foot basal area per acre, but denser tree conditions occur in some locations such as north-facing slopes and canyon bottoms. Large snags 18 or greater DBH average 1-2, and downed logs average 3 per acre. The composition, structure, and function of vegetative conditions are resilient to disturbances and climate variability. The Gambel oak subtype is maintained with large oak trees scattered across the landscape, providing cooler, moister microsites for wildlife.

Objectives are as follows:

- Within 10 years of plan approval, thin (using group selection or free thinning) 50,000 to 260,050 acres of Ponderosa Pine. Treatment priorities should move forest priority 6th code watersheds toward satisfactory conditions.
- Within 10 years of plan approval, use prescribed fire to underburn (low severity) 150,000 to 300,000 acres of Ponderosa Pine. Treatment priorities should move forest priority 6th code watersheds toward satisfactory conditions.
- During the 10 years following plan approval, use naturally ignited fires (i.e. lightning-caused fires) to treat 135,000 acres with low severity fire. Treatment priorities should move forest priority 6th code watersheds toward satisfactory conditions.

Four of the guidelines emphasize the protection of existing old growth, to promote development of future old growth, and to protect old trees, including Gambel oaks. Another guideline emphasizes snags and downed logs along edges of openings and within groups and clumps of trees. Slash is managed to minimize impacts from Ips beetles, and to provide habitat for small mammals and turkey nesting habitat.

Collectively, the desired conditions, objectives and guidelines provide fairly well for the habitats needed by ponderosa pine priority migratory birds. Moving towards more open stand conditions using thinning and fire will benefit Grace's warbler, Lewis' woodpecker, olive warbler, and purple martin. Provisions for maintaining a portion of the landscape in denser habitats will provide the more closed canopy conditions used by Cordilleran flycatchers. Maintaining a large

snag component will benefit the woodpeckers. Desired conditions and guidelines for old growth should provide for habitat needed by flammulated owls, but compared to Alternative A, management for old growth is less explicit in the amount to manage for. The 1987 Plan calls for managing at least 20%, or as much of the landscape as possible, as old growth. Alternative B does not identify the amount of old growth to maintain or develop although desired conditions describe "...having sufficient groups of old growth to be representative of the vegetation type prior to 1850". Also, old growth in Alternative A is in stands from 100-300 acres in size, while Alternative B group size averages 0.5 acres in size, with 2-40 trees per group. For most priority bird species, Alternative A and B provide similar guidance and will have similar effects. For the flammulated owl, which used mature forests and old-growth, Alternative A has clearer guidance for the minimum amount of old growth to maintain, and provides for larger groups (stand size) in old growth conditions.

High Elevation Grassland

The desired condition for Great Basin and Montane/Subalpine grassland PNVTs describes a landscape that provides good habitat for migratory birds. The goal is to have native vegetation in a mix of age classes with the height, density, and cover of plants that supports historic fire return intervals. Canopy cover of trees and shrubs is less than 10%. Soil erosion is minimal, and long-term soil productivity is maintained. The desired condition describes connectivity among grasslands. Surface drainages and subsurface flow patterns of water are maintained to return water flow into connected water bodies and streams. The desired condition includes a description of a mosaic of vegetation, ranging from densely vegetation, to bare areas that result from natural activities, such as prairie dog burrowing.

Desired conditions for Pinyon Juniper grasslands also describe a landscape that provided good habitat for migratory birds. Canopy cover is 10-30%, providing a native herbaceous understory that provides food and cover for wildlife and can support frequent surface fires.

One of the guidelines for Great Basin and Montane/Subalpine grassland PNVTs would contribute to retaining 90 percent of potential ground cover. Guidelines for pinyon juniper grasslands describe the intent to maintain seral grasslands as grasslands, rather than enhancing successional states and call for improvement in soil and watershed conditions and herbaceous vegetation growth.

An objective that would help move grassland habitats towards desired condition include one specifically identified to restore/enhance 7,000 acres of Great Basin Grasslands during each 10 year period during the life of the Plan. For pinyon juniper grasslands, objectives are to treat between 1,000-10,000 acres and to use naturally ignited fires to treat 3,750 acres with low to mixed severity fire every 10 years.

While not tied specifically to grassland PNVTs, other objectives that call for soil and watershed improvements, naturalizing and decommissioning roads, implementation of actions to benefit federally-listed species, and restoration of terrestrial wildlife habitat could contribute to meeting desired conditions for migratory bird habitat.

Both of the priority migratory birds for high elevation grasslands only occur as transient/migrants on the Forest. The desired conditions, objectives, and other guidance for these grasslands are expected to provide for suitable transient/migrant habitat for these migratory birds.

Pinyon Juniper (Pinyon Juniper Grasslands, Evergreen Shrub, and Woodlands)

Desired conditions for pinyon juniper types describe a landscape with a shifting mosaic of trees, interspersed with openings that provide enough connectivity for pronghorn movement. Large snags and old trees with dead limbs and tops are scattered across the landscape. Vegetative conditions are resilient to disturbances and climate variability. Enough ground cover is present to resist erosion. Old growth occurs in pinyon juniper woodlands as individual trees and patches of old trees.

Objectives call for mechanical treatment of 1,000 to 10,000 acres, and 7,500 acres using naturally ignited fires within 10 years of plan approval. This represents 1-3% of pinyon juniper habitats (600,660 acres).

Guidelines call for maintenance of pushes on grassland soil types, restoration of grasslands, using slash treatments to improve herbaceous vegetation growth.

Priority species (black-throated gray warbler, gray flycatcher, gray vireo, pinyon jay, and sage sparrow) need mature or old-growth stands that are generally open, with good ground cover and a shrub component. Mature pinyon trees provide the seeds necessary for pinyon jays. The Modified Proposed Plan only manages for old growth in the woodland component, which represents only 13% of the pinyon juniper types. Alternative B does not emphasize maintenance or development of old growth conditions as much as Alternative A.

Chaparral

Desired conditions describe chaparral as being in a constant state of transitions between young and old stages as a result of fires. Young stages have more of a grass and forb component. Older stages are very dense. Fire hazard is reduced in the wildland-urban interface. Ground cover protects soils from compaction and erosion, and biological soil crusts improve nutrient cycling.

The guideline for chaparral is to provide a diversity of burn intensities within burn units, and burn units are rotated across the landscape. There are no objectives or standards.

Although desired conditions provide for habitat diversity, there are no objectives to treat chaparral vegetation, so there is not likely to be much management in this habitat during the life of the plan. Therefore, there will be few impacts, plus or minus, to Virginia's warbler and black-chinned and sage sparrows and their habitat.

High Elevation (Montane Willow and Mixed Broadleaf) and Low Elevation (Cottonwood Willow) Riparian

Desired conditions for all riparian forest types describe conditions that would provide good habitat for migratory birds. Goals are to have diverse native vegetation in multiple age classes, un-compacted soils, and ecosystems that are functioning within their natural potential.

The objective for riparian forest types is to restore at least 200-500 acres of non-functioning and functioning-at-risk riparian areas within 10 years following plan approval. This represents 5 to 12 percent of the riparian habitats that are currently non-functioning and functioning-at-risk (Table 3).

Guidelines call for establishment of streamside management zones to provide protections from management activities, to limit livestock utilization to 20% of the woody vegetation, to keep mesquite bosques unfragmented, to have three or more age classes present, and to maintain 80% of natural herbaceous vegetative cover.

Collectively, the guidance in Alternative B will contribute positively to migratory bird riparian habitat as projects are implemented under the Modified Proposed Plan. Benefits are not as strong as Alternative A, since that alternative calls for all riparian habitats to be in or trending towards satisfactory conditions by 2030. Extrapolating out to 2030, this Alternative will improve 9-23% of riparian acres, but the remaining will stay in at-risk or non-functioning conditions.

Desert Communities and Semi-Desert Grasslands

Desired conditions for desert communities calls for various age classes of native shrubs, forbs, and grasses with little soil compaction or erosion. Twenty to 25% shrub cover exists. Biological crusts improve nutrient cycling.

Desired conditions for semi-desert grasslands are to have open grasslands, punctuated by groves of trees and shrubs. Shrub cover is less than 10%. Predominant species are native grasses. Compaction and erosion is minimal.

The objective for semi-desert grassland is to restore/enhance 3,500 acres (4%) every 10 year period.

The guideline for desert communities is to limit excessive ground disturbance. The guideline for semi-desert grasslands is to avoid ground-disturbing activities when sensitive soils are wet.

Direction to maintain a variety of age classes, including 20-25% brush cover in desert communities and groves of shrubs within semi-desert grasslands will result in maintenance of the brushy grassland states that Bendire's thrasher and sage sparrows use. The objective to restore a portion of semi-desert grasslands will have some benefit, but the amount is very small. This alternative provides stronger guidance than Alternative A for these migratory species.

Important Bird Areas

There is no specific guidance for the management of IBAs in the Modified Proposed Plan. Environmental consequences are described above by habitat.

Determination of Effects

Guidance in the Modified Proposed Plan provides for migratory bird habitat through desired conditions, objectives, standards and guidelines for the vegetation types. Additional general direction to improve habitats and maintain viable populations in forestwide wildlife direction also applies to migratory birds.

Alternative B provides similar guidance as Alternative A for spruce fir, mixed conifer, high elevation grassland, and chaparral, and stronger guidance for desert communities and semi-desert grasslands. Alternative A provides stronger guidance for ponderosa pine old growth, pinyon juniper, and high elevation riparian than Alternative B. Overall, implementation of Alternative B will result in less protections and habitat improvement for migratory birds than Alternative A.

Unintentional take could occur from management activities that destroy nests or kill individual birds.

Alternative C

Environmental consequences

Alternative C is the same as Alternative B, except for the seven elements described below. Therefore, the environmental consequences of this alternative are similar to Alternative B are similar, with the following analysis focused on the differences based on the seven elements.

1. For most PNVTs/vegetation types, the acreage in proposed wilderness acres is relatively minor, but for six PNVTs (Cottonwood Willow Riparian, Mixed Broadleaf Riparian, Montane Willow Riparian, Pinyon Juniper Evergreen Shrub, Pinyon Juniper Woodland, and Semi-desert Grassland), the acreage represents more than 5% of the total acres on the Forest (Table 21).

Table 21. PNVT Acreage within Alternative C Proposed Wilderness. PNVTs with 5% or more of total PNVT acreage are italicized and in bold type.

PNVT	Wilderness Acres	Total PNVT Acres	Percent of Total
Alpine Tundra	0	939	0.00%
<i>Cottonwood Willow</i>	452	2507	18.03%
Desert Communities	974	63548	1.53%
Gallery Coniferous Riparian	0	200	0.00%
Great Basin Grassland	2,327	92913	2.50%
Interior Chaparral	1,707	50471	3.38%
<i>Mixed Broadleaf Riparian</i>	328	3612	9.08%
Mixed Conifer with Aspen	347	37083	0.94%
Mixed Conifer with Frequent Fire	283	49619	0.57%
Montane Subalpine Grassland	6	23429	0.03%
<i>Montane Willow Riparian</i>	442	3829	11.54%
<i>Pinyon Juniper Evergreen Shrub</i>	50,638	263,835	19.19%
Pinyon Juniper Grassland	3,648	261432	1.40%
<i>Pinyon Juniper Woodland</i>	13,665	75,393	18.13%
Ponderosa Pine	4,976	791,897	0.63%
<i>Semi-desert Grassland</i>	11,680	89,683	13.02%
Spruce Fir	0	13,946	0.00%
Urban or Agricultural	0	100	0.00%
Water	0	3,176	0.00%
Wetland Cienega	0	9,879	0.00%
Total Wilderness Acres:	91,473		

Riparian - Cottonwood Willow, Mixed Broadleaf, and Montane Willow

Designation as wilderness would provide extra protections for riparian migratory birds, since these habitats would be managed for the suite of wilderness characteristics, including native species and maintenance of natural processes. Recreation use would be managed to protect wilderness character.

Pinyon Juniper – Evergreen Shrub and Woodland

Designation as wilderness would provide extra protections for pinyon juniper migratory birds, since these habitats would be managed for the suite of wilderness characteristics, including native species and maintenance of natural processes. Recreation use would be managed to protect wilderness character. Priority migratory birds need mature or old-growth stands that are generally open, with good ground cover and a shrub component. Designation of a portion of these pinyon juniper habitats would help provide and protect these conditions. In some cases, development of more open structure is needed, and natural ignitions could be managed to achieve this in wilderness areas, and can be actively treated in areas outside of wilderness.

Semi-desert Grassland

Designation as wilderness would provide extra protections for migratory birds that use semi-desert grasslands, since these habitats would be managed for the suite of wilderness characteristics, including native species and maintenance of natural processes. Recreation use would be managed to protect wilderness character. However, semi-desert grasslands are highly departed from historical conditions, and management activities may be needed to help restore them. Designation as wilderness would limit management tools primarily to naturally ignited fire. Since over 80% of semi-desert grasslands would be outside of wilderness, this will not have a large negative impact on migratory birds, and protection of wilderness character and primitive recreation use can provide protections to migratory birds and their habitat.

Overall, designation of wilderness would be beneficial for migratory birds that use these habitats.

2. Desired conditions for WHMAs are to focus on protection of wildlife and their habitats. Habitat restoration is a focus, using establishment of natural fire regimes, range condition improvement, and reducing road densities. Overall, standards and guidelines for WHMAs will reduce disturbance from recreation, livestock grazing, and motorized vehicles compared to Alternative A or B. In some cases, high proportions of PNVT acreages will be in WHMAs (Table 18). Given the emphasis on protection and management to benefit wildlife, the designation of WHMAs would positively impact migratory birds and their habitats.
3. Expanding the Cottonwood Basin Fumeroles Geological Area could have a positive impact on some migratory birds. The expanded Botanical/Geological area would contain 1,324 acres of semi-desert grassland and 499 acres of desert communities. Management emphasis is on protecting the plant communities and geology. Priority species that use these habitats (Bendire's thrasher and sage sparrow) would benefit from protection and management of the native plant communities that provide food and cover for these species.
4. Designating Walnut Canyon, Sedona-Oak Creek, Long Valley, and parts of the Flagstaff Neighborwoods management areas as not suitable for recreational (non-hunting) shooting will minimally impact migratory birds by reducing the amount of disturbance from shooting.

5. Designating the Walnut Canyon management area and areas with a Recreation Opportunity Spectrum objective of “semi-primitive non-motorized” as not suitable for snowmobile use, except to provide ingress/egress for private inholdings will have no impact on migratory birds that use habitats in this area, since they migrate in the winter.
6. Although a small portion of PNVT acres is within RNAs (Table 22), restricting grazing will have some positive impacts on migratory birds in those habitats. Restricting grazing will improve the herbaceous understory, increasing cover and seed head production.

Table 22. PNVT acres within Research Natural Areas (RNAs).

PNVT	Total Acres in RNAs	Total PNVT Acres	Percent of Total
Alpine Tundra	208	939	22.15%
Interior Chaparral	715	50471	1.42%
Mixed Broadleaf Riparian	18	3612	0.50%
Mixed Conifer with Frequent Fire	3	49619	0.01%
Montane Willow Riparian	117	3829	3.06%
Pinyon Juniper Evergreen Shrub	1,517	263,835	0.57%
Pinyon Juniper Woodland	74	75,393	0.10%
Ponderosa Pine	2,102	791,897	0.27%
Spruce Fir	934	13,946	6.70%
Total RNA Acres:	5,688		

7. As discussed in the analysis for ponderosa pine and pinyon juniper migratory bird habitats, Alternative A had stronger old growth guidance than Alternative B. Therefore, retaining the standards and guidelines from the 1987 Forest Plan relating to old growth will be more beneficial to migratory birds.

Determination of Effects

Additional wilderness areas, WHMAs, and retaining the old growth standards and guidelines result in stronger guidance and protections for migratory birds than either Alternative A or B.

Unintentional take could occur from management activities that destroy nests or kill individual birds.

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