ATTACHMENT "B"

GUIDANCE CRITERIA
for
DETERMINING THE EFFECTS OF
ON-GOING GRAZING
AND ISSUING TERM GRAZING PERMITS
on
SELECTED THREATENED AND ENDANGERED
SPECIES, AND SPECIES PROPOSED FOR LISTING
and
PROPOSED AND DESIGNATED CRITICAL HABITAT

REGION 3

WILDLIFE, FISHERIES, AND RARE PLANTS
USDA FOREST SERVICE

APRIL 15, 2002

CONTENTS

INTRODUCTION 1
DEFINITIONS 3
PLANTS 5
KUENZLER HEDGEHOG CACTUS 5
SACRAMENTO PRICKLY POPPY 6
SACRAMENTO MOUNTAINS THISTLE 7
TODSEN'S PENNYROYAL 8
ZUNI FLEABANE 9
HOLY GHOST IPOMOPSIS 10
ARIZONA AGAVE 11
ARIZONA HEDGEHOG CACTUS 12
ARIZONA CLIFF-ROSE 12
PIMA PINEAPPLE CACTUS 13
HUACHUCA WATER-UMBEL 14
CANELO HILLS LADIES'-TRESSES 15
DETERMINATIONS FOR ALL PLANTS DESCRIBED ABOVE 15
AQUATIC SPECIES 17
BEAUTIFUL SHINER 17
CHIHUAHUA CHUB 18
GILA TOPMINNOW 20
GILA TROUT 21
LOACH MINNOW 23
SPIKEDACE 26
LITTLE COLORADO SPINEDACE 28
SONORA CHUB 30
APACHE TROUT 31
DETERMINATIONS FOR ALL FISH DESCRIBED ABOVE 32
CHIRICAHUA LEOPARD FROG 33
DETERMINATIONS FOR THE CHIRICAHUA LEOPARD FROG 37
TERRESTRIAL MAMMALS 38
MEXICAN GRAY WOLF 38
DETERMINATIONS FOR THE MEXICAN GRAY WOLF 39
BLACK-FOOTED FERRET 40
DETERMINATIONS FOR THE BLACK-FOOTED FERRET 41
JAGUAR 41
JAGUARUNDI 43
OCELOT 44
DETERMINATIONS FOR THE JAGUAR, JAGUARUNDI, AND OCELOT 45
LESSER LONG-NOSED BAT 46
DETERMINATIONS FOR THE LESSER LONG-NOSED BAT 49
MEXICAN LONG-NOSED BAT 49

DETERMINATIONS FOR THE MEXICAN LONG-NOSED BAT 50
BIRDS 51
BALD EAGLE 51
DETERMINATIONS FOR THE BALD EAGLE 52
NORTHERN APLOMADO FALCON 53
DETERMINATIONS FOR THE NORTHERN APLOMADO FALCON 56
CACTUS FERRUGINOUS PYGMY-OWL 56
DETERMINATIONS FOR THE CACTUS FERRUGINOUS PYGMY OWL 58
MEXICAN SPOTTED OWL 59
DETERMINATIONS FOR THE MEXICAN SPOTTED OWL 61
SOUTHWESTERN WILLOW FLYCATCHER 62
DETERMINATIONS FOR THE SOUTHWESTERN WILLOW FLYCATCHER 67
REFERENCES CITED 69

INTRODUCTION

The purpose of these guidance criteria is to streamline consultation under section 7(a)(2) of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA). This document contains guidance in the form of criteria for use in making ESA section 7 effects determinations for selected threatened, endangered, and proposed (TEP) species and/or proposed or designated critical habitat for livestock grazing activities in the U.S. Forest Service's Southwestern Region (FS). These guidance criteria do not constitute an amendment to forest plans nor do they require a modification of grazing permits; these guidance criteria are not intended to provide allotment management direction. The criteria described in this document can also be used by qualified FS fish and wildlife biologists and botanists to assist in preparing regional grazing consultation forms for each grazing allotment containing federally listed or proposed species and/or proposed or designated critical habitat as required under section 7(a)(2) of the ESA.

The use of these criteria will result in **one of three ESA effects determinations**: 1) no effect, 2) may affect, not likely to adversely affect, or 3) may affect, likely to adversely affect. Consultation under ESA is not required if no TEP species or their habitat, or critical habitat, occur on the allotment or would be affected by the grazing activity directly or indirectly. In that situation, all that is required is a notation to the file or to the appropriate NEPA document. Biological assessments resulting in a determination of **"no effect"** do not require consultation with the U.S. Fish and Wildlife Service (FWS). The ESA conclusion of "no effect" is appropriate when a TEP species and/or critical habitat is present in the affected area and it is determined that the proposed action will not affect proposed or listed species and/or proposed or designated critical habitat.

Biological assessments that result in a determination of "may affect, not likely to adversely affect" **require concurrence from the FWS**, and that concurrence concludes informal consultation. The ESA determination of **"may affect, not likely to adversely affect"** is appropriate when effects to TEP species and/or critical habitat are expected to be insignificant, discountable, or completely beneficial. **Beneficial effects** are contemporaneous positive effects without any adverse effects to the species. **Insignificant effects** relate to the size of the impact and should never reach the level where take occurs. **Discountable effects** are those effects that are extremely unlikely to occur. Based on best judgment, a person would not: 1) be able to meaningfully measure, detect, or evaluate insignificant effects; or 2) expect discountable effects to occur.

For both the "no effect" and the "may affect, not likely to adversely affect" determination to remain in effect for the life of the term permit (up to 10 years), **annual confirmation** throughout the lifetime of the permit must take place to ensure the criteria for those findings continue to be met. **This requires each user/Forest to prepare an annual report for the FS regional office.**

Biological Assessments, which result in a determination of **"may affect, likely to adversely affect"** will require formal section 7 consultation with the FWS. A determination of "may affect, likely to adversely affect" is appropriate if any adverse effect to listed species and/or designated critical habitat may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effects are not discountable, insignificant, or completely beneficial. If both adverse and beneficial effects are anticipated to occur, the appropriate determination is **"may affect, likely to adversely affect"**.

A **"conference"** is required when an action is likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. However, Federal action agencies may request a conference on any action that may affect proposed species or proposed critical habitat. The FWS can request a conference after reviewing available information suggesting an action is likely to jeopardize proposed species or destroy or adversely modify proposed critical habitat.

For documentation purposes, use of the **regional grazing consultation forms** is recommended. These forms are intended to aid in documenting the appropriate information necessary for FWS concurrence. They do not provide a "short cut" in the consultation process. Specific documentation supporting the determination of effects is always required. A **point-by-point** discussion of how management on the allotment is specifically consistent with the appropriate determination for a given species is mandatory. Discussion of resource background should be sufficiently detailed for the FWS to adequately analyze the environmental baseline and assess project effects. Range condition and watershed data should be less than 10 years old. Watershed data, older than 10 years, must be validated by appropriate resource specialists, to ensure that the data is still an accurate reflection of current conditions.

The guidance criteria are divided into **four sections**: 1) a plant section for vascular plants and their habitats, 2) an aquatic section for fish, amphibians, and their habitats, 3) a terrestrial mammals section for carnivores, bats and their habitats, and 4) a birds section for birds and their habitats. The discussion for each species includes information on its ESA status, where it occurs on FS lands, and basic biological information on the species and/or its designated critical habitat. The application of these criteria is mandatory unless there is detailed site-specific information available on species needs, habitat conditions, and/or grazing activities that would allow the field unit to make a determination of effect outside these criteria. If the field unit chooses to make a determination outside these criteria, then standard ESA section 7 consultation procedures should be followed.

DEFINITIONS

ALLOTMENT: A designated area of land available for livestock grazing.

EMBEDDEDNESS: The degree to which larger particles (boulder, rubble, or gravel) are surrounded or covered by fine sediment in a water channel. This allows evaluation of channel substrate suitability for fish spawning and egg incubation, and channel habitats for aquatic invertebrates and young fish.

ENDANGERED SPECIES: Any species in danger of extinction throughout all or a significant portion of its range.

ENVIRONMENTAL BASELINE: The past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process.

FORAGE UTILIZATION: The portion or degree of the current year's forage production that is consumed or destroyed by animals (including insects). The term may refer to a single plant species, a group of species, or to the vegetation community as a whole (must be measured at the end of the growing season for the species or vegetation community for which utilization is being determined).

INDIRECT EFFECTS: Those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur.

INCIDENTAL TAKE: Take of listed fish or wildlife species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a Federal agency or applicant.

LIVESTOCK MANAGEMENT ACTIVITIES: Any activity or program designed to improve production of forage including treatments or facilities constructed or installed for the purpose of improving the range resource or the management of livestock. This includes non-structural improvements, which are practices and treatments undertaken to improve range condition. Structural improvements are permanent features designed to facilitate management and control distribution and movement of livestock. Some examples of structural improvements are dams, impoundments, ponds, pipelines, fences, corrals, wells, and trails. Some examples of non-structural improvements are cutting, chaining, planting, and herbicide applications.

PROPOSED SPECIES: Any species of fish, wildlife, or plant that is proposed in the Federal Register to be listed under section 4 of the ESA.

QUALIFIED FISHERIES BIOLOGIST: A qualified fisheries biologist may be: 1) a person currently classified at a GS-482 grade 11 or 12, or 2) a person classified at below the GS-482 grade 11 who has extensive field experience and knowledge of fish habitat needs as determined by the FS's Regional Director of Wildlife, Fisheries and Rare Plants.

TAKE: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.

TEP SPECIES: Species designated by the FWS as endangered or threatened and those species that are proposed for listing as endangered or threatened under provisions of the ESA.

TEP SPECIES HABITAT: For the purposes of these criteria, TEP species habitat includes occupied habitat, unoccupied suitable habitat, unoccupied potential habitat, and/or proposed and designated critical habitat.

THREATENED SPECIES: Any species, which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

STREAMBANK: That portion of the channel cross-section that restricts lateral movement of water. The bank usually has a gradient steeper than 45° and exhibits a distinct break in slope from the stream bottom. An obvious change in stream bottom substrate may be a reliable delineation of the bank.

STREAM CHANNEL: That portion of the channel cross-section containing the stream that is obviously distinct from the surrounding area due to breaks in the general slope of the land, lack of terrestrial vegetation, and changes in the composition of the substrate materials. The stream bottom or active channel is that portion of the channel between the banks where annual bedload transport occurs.

SUBWATERSHED: Subwatershed means a 5th code watershed. These typically range from 5,000 ac to greater than 100,000 ac in size. Natural Resources Conservation Service (NRCS) Hydrologic Unit Code (HUC) maps entitled "Conservation Needs Inventory Watersheds" form our reference.

3 Implement management strategies that will restore good conditions to degraded riparian communities as soon as possible.

DETERMINATIONS FOR THE MEXICAN SPOTTED OWL

No Effect

1. No livestock grazing or livestock management activities will occur within protected and restricted habitats, as defined by the species' recovery plan.

May Affect, Not Likely to Adversely Affect (must meet all of the criteria)

1. Livestock grazing or livestock management activities will occur within PACs, but no human disturbance or construction actions associated with the livestock grazing will occur in PACs during the breeding season.

2. Livestock grazing and livestock management activities within protected and restricted owl habitats will be managed for levels that provide the woody and herbaceous vegetation necessary for cover for rodent prey species, the residual biomass that will support prescribed natural and ignited fires that would reduce the risk of catastrophic wildfire in the Forest, and regeneration of riparian trees.

3. In mountain meadows (subject to seasonal livestock use May-October), which are owl foraging areas, livestock grazing will be at a level that maintains a minimum cover height of 4 in. of herbaceous vegetation, providing cover for the owls' prey species. The 4 in. stubble height minimum will be met 10 days after the onset of summer rains or August 1, whichever comes first, and maintained through the end of the grazing season.

SOUTHWESTERN WILLOW FLYCATCHER *(Empidonax traillii extimus)*

Endangered Species Act Status:	Endangered (March 29, 1995)
Forest Occurrence:	Apache-Sitgreaves, Cibola, Carson, Coconino, Gila, Prescott, Santa Fe, Tonto
Recovery Plan:	Yes (Draft April 2001)
Critical Habitat:	No

Description. The southwestern willow flycatcher is a small passerine bird about 5.75 in (15 cm) in length and weighing 0.4 oz (11 gm). Its song is a sneezy-fitz-bew or fit-za-bew, and the call is a repeated whit. Flycatchers typically produce these or variations of these calls when disturbed or agitated.

Life History. One of four currently recognized flycatcher subspecies (Phillips 1948, Unitt 1987), the southwestern willow flycatcher is a neotropical migrant that breeds in the southwestern

United States and migrates to Mexico, Central America, and extreme northern South America during the nonbreeding season (Phillips 1948). This subspecies begins arriving on breeding grounds in Arizona and New Mexico in late April and early May (Maynard 1994, Sferra *et al.* 1995). Flycatchers generally leave the United States by mid-September. It is an insectivorous bird and hunts by perching on a branch and making short, direct flights, also called sallies, to capture flying insects. Nesting begins in late May and early June, and renesting attempts can continue into late July (with late fledging to mid-August). Flycatchers lay three to four eggs (smaller clutch sizes with successive renests) and incubate for 12-13 days. Fledging occurs in 12-15 days.

Habitat. The flycatcher is a riparian obligate, nesting along rivers, streams, and other wetlands where dense growths of willow (*Salix* spp.), baccharis (*Baccharis* spp.), buttonbush (*Cephalanthus occidentalis*), boxelder (*Acer negundo*), saltcedar (*Tamarix* spp.) or other plants are present, often with a scattered overstory of cottonwood (*Populus* spp.) and/or willow. Historic nest locations of the flycatcher throughout its range are not well known. It is not known whether the habitats where they are located today are representative of all the different habitat types they could use for nesting. The flycatcher's use of dense salt cedar at the inflows or perimeter of human-made lakes in Arizona, along with canopy use of mature box elders along water ditches in southwestern New Mexico, are indicative of how this subspecies uses a variety of habitats. Understanding the full range of potential flycatcher habitats is complicated by human-caused watershed changes, patchy flycatcher distribution, and low flycatcher population numbers.

As populations recover, flycatchers could occupy riparian habitats that today might be considered marginal or unsuitable. Patches of dense, multi-storied vegetation found on broad portions of otherwise steep, narrow creeks, may become secondary habitat for nesting southwestern willow flycatchers after preferred habitats are occupied. Applying rigid requirements for flycatcher potential habitat based on current understanding may not be the most appropriate way to recover the species. The following habitat descriptions should be used as guidance, due to the need for further information about factors that lead to flycatcher site occupation.

Suitable Habitat

The flycatcher nests in dense riparian vegetation that is generally taller than 3-4 m, depending on elevation and vegetation types, with a high percentage of canopy cover, and often along rivers, streams, swamps, seeps, irrigation ditches, or other wetlands. Perennial flow, surface water, or saturated or moist soil is usually located in, adjacent to, or nearby nesting areas from April through September. The distance between the nest and these hydrologic conditions is documented to be as far as 120-150 m, especially when subsurface flow is keeping soils moist around the site. More typically, the nest is within 50-100 m of these hydrologic conditions. Farther distances have also been observed, especially in situations where reservoirs have receded.

Vegetation species composition and structure vary across the range of the flycatcher. The variation ranges from homogenous patches of one or several species with a single canopy layer to heterogeneous patches of numerous species with distinct under-, mid-, and over-stories. Canopy cover is consistently high (greater than 90%) throughout the range (Spencer *et al.* 1996, Cooper 1996). Flycatchers are known to nest in mature, dense coyote willow (*Salix exigua*) patches, sometimes with a sparse overstory of cottonwood, as well as habitat that is a mixture of native and nonnative riparian species, including tree willow (*Salix goodingii*), saltcedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolia*), box elder (*Acer negrundo*), and various other species. Along the Gila River near Cliff, New Mexico, flycatchers nest in mature boxelder with a relatively open understory. At this site, nests are typically located much higher (20-60 ft) than the average range-wide nest height. Flycatchers have also been found in large stands of monotypic saltcedar in Arizona, Nevada, and California. Along the Rio Grande in New Mexico, nesting flycatchers have been found in predominantly saltcedar vegetation, with other nonnative species also occurring in the patch (D. Ahlers, Bureau of Reclamation, pers. comm. 1999). Many areas that are predominant or monotypic saltcedar or Russian olive in New Mexico have not yet been surveyed, as of 2000.

Channels associated with flycatcher-preferred streams are often wide and shallow, with a well-defined floodplain and broad valley. Many of the streams are either not or slightly entrenched, with well-defined meanders and riffle/pool bed features. Gradients are often less than 1%. Headwaters are usually not suitable unless they are low in gradient. Quiet water dominates, as in backwaters, pools, beaver ponds, or non-riffle stream stretches. Beaver ponds may be of particular importance in areas where the stream gradient is above 1%. In the case of wetlands and shorelines, water levels can fluctuate significantly. Water may recede from the nesting area by the end of the nesting season.

There are no observed patch-age requirements, but structure must meet perching and nesting needs for height and density. Song perches are necessary, but can be provided by snags or taller branches of a relatively even patch. Large overstory trees may be present and used for singing, hunting, and observation. Nests are built in shrubs or trees in willow thickets and deciduous woodlands along watercourses. Typically, nests are placed 1.5-8.5 m above ground level, most often in a branch fork, but occasionally on a horizontal branch (Sferra *et al.* 1995). Flycatcher nests have also been found as high as 19 m above ground level.

Distribution. The historical range of the southwestern willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and the States of Sonora and Baja California Norte in extreme northwestern Mexico. Current known breeding distribution has a similar extent, and includes southern California and Baja California, Arizona, New Mexico, extreme southern portions of Nevada and Utah, and southwestern Colorado (Unitt 1987). Using data collected between 1993 and 1999, estimated State totals throughout the current distribution included about 328 territories in New Mexico, 298 in Arizona, 173 in California, 54 in Colorado, 17 in Utah, and 44 in

Nevada, for a total of about 914 territories range-wide (Paradzick *et al.* 2000; M. Sogge, U.S. Geological Survey, pers. comm. 2000; Williams and Leal 1999; Spencer *et al.* 1996; Sferra *et al.* 1995; Parker and Hull 1995; Maynard 1994; Whitfield 1994; Whitfield and Strong 1995; Holmgren, *in litt.*). The number of territories represents the approximate number of singing or displaying males located, but does not necessarily equal the number of breeding pairs. In 1998, applying the same data used to estimate the approximate number of territories, the estimated number of pairs of southwestern willow flycatchers was 550-650 (Sogge 1999).

In Arizona, the flycatcher historically ranged along major river systems and probably major tributaries. Historical records exist from the Colorado River near Lee's Ferry and near the Little Colorado River confluence (A. Phillips, pers. comm., cited in Unitt 1987), the Santa Cruz River near Tucson (Swarth 1914, Phillips 1948), the Verde River at Camp Verde (Phillips 1948), the Gila River at Fort Thomas (W.C. Hunter, pers. comm., cited in Unitt 1987), the White River, the upper and lower San Pedro River (Willard 1912, Phillips 1948), and the Little Colorado River headwaters area (Phillips 1948). Currently, resident flycatchers occur along 12 drainages in Arizona, including the Colorado, Bill Williams, Verde, Salt, Tonto Creek, Big Sandy, Gila, San Pedro, Santa Maria, Little Colorado, San Francisco, and Hassayampa drainages (Paradzick *et al.* 2000, Sferra *et al.* 1995, Spencer *et al.* 1996). The flycatcher occurs in Arizona on the Apache-Sitgreaves and Tonto NFs, and on private land near the Prescott and Coconino NFs.

In New Mexico, breeding flycatchers occur along major river systems, tributaries and creeks. Flycatchers are known to breed in eight major drainages, with records from the Rio Grande, Chama, Zuni, Coyote Creek, Gila, Rio Nutria, Bluewater Creek, and San Juan drainages (Hubbard 1987, Cooper 1996, Maynard 1994). Territorial males have also been located in the San Francisco River drainage (Williams and Leal 1999). Currently, the flycatcher occurs on the Carson, Cibola, and Gila NFs, and on non-FS land near the Santa Fe and Gila NFs in New Mexico.

Effects Analysis. In the final rule to designate the flycatcher as endangered, the FWS describes activities that could potentially harm the flycatcher and result in take of the subspecies. The activities listed that involve livestock grazing are: 1) livestock grazing that results in direct or indirect destruction of riparian habitat; and 2) activities such as continued presence of livestock and fragmentation of flycatcher habitat that facilitate brood parasitism by the brown-headed cowbird (U.S. Fish and Wildlife Service 1995a). On NF lands, the main cause of decline in flycatcher habitat can be attributed to the destruction, modification, and fragmentation of habitat. Livestock grazing has contributed to the destruction, modification, and in some cases, fragmentation of flycatcher habitat. Nest parasitism by brown-headed cowbirds (*Molothrus ater*) is also partly responsible for declines in flycatcher populations. Individual populations are threatened by small size, nest parasitism by brown-headed cowbirds, and nest predation. A critical season (April 1 through July 31), rather than the breeding season, has been delineated for situations in which brown-headed cowbird parasitism is a concern (Rob Marshall, FWS, pers. comm.; U.S. Fish and Wildlife Service 1995b). The removal of cowbird attracting activities by the beginning of the critical season in April allows a period of approximately one month for

cowbirds to depart from the area before flycatchers arrive for breeding. Restricting activities until July 31 minimizes the presence of cowbirds during the egg-laying and incubation period (mid-June to end of July) and will decrease the potential for nest parasitism.

Livestock grazing in occupied areas may pose a direct threat to flycatchers by physically disturbing or damaging the nest, or spilling contents of the nest as they walk by (U.S. Fish and Wildlife Service 1993). This is especially true in single-story or regenerating stands. Livestock grazing in potential flycatcher habitat can retard the growth of woody vegetative species, slowing or arresting progression towards suitable habitat. Livestock overgrazing in suitable habitat may not allow for retention of vegetative characteristics needed for flycatcher nesting.

Livestock overgrazing in riparian areas indirectly affects the flycatcher through habitat degradation and modification of riparian areas (U.S. Fish and Wildlife Service 1993a). If given the opportunity, livestock can first overuse the herbaceous component and if they are not removed or redirected, they will begin feeding on riparian shrubs and young trees. This results in changes in plant structure and reduction of plant diversity and density (Bock *et al.* 1992). Year-round or summer livestock grazing appear to be particularly damaging to riparian habitats (Bock *et al.* 1992). During these periods, regeneration of critical tree species such as willow, boxelder, and cottonwood may be curtailed (U.S. Fish and Wildlife Service 1993a). In addition to direct herbivory of woody species, livestock can destroy riparian habitat by bedding, trampling, and trailing through it. These effects can be significant, especially if livestock concentrate in an area and the plants are small.

Other impacts that livestock overgrazing has on riparian habitats include compaction of surface soil that reduces infiltration and increases surface runoff, reduction of bank stability which leads to accelerated erosion and increased sedimentation, and removal of organic material due to reduction in plant vigor and density (Verde Natural Resources Conservation District 1993). These impacts result in increased susceptibility to destruction of a riparian area during heavy flow events. Livestock grazing during the sprouting and regeneration of the cottonwood/willow community after these flood events has led to increased fragmentation, reduced or eliminated recruitment, and ultimately, total degradation. As native plant species try to compete with non-natives, livestock's preference for native plants favors establishment of nonnatives. Changes in riparian areas as a result of livestock overgrazing are often linked to more widespread changes in watershed hydrology.

Increases in flycatcher populations have been observed where livestock grazing has been reduced, modified, or eliminated in riparian areas. Harris *et al.* (1987) observed flycatchers increase by 61% over a 5-year period after grazing was reduced. Dramatic increases in other avian species associated with cottonwood/willow habitat were found on Arizona's San Pedro River 4 years after the removal of livestock.

Brown-headed cowbird parasitism is known to have detrimental effects on neotropical migratory birds including the flycatcher (Robinson *et al.* 1992). Cowbirds are brood parasites and

parasitize smaller songbirds. Cowbird parasitism can impact host populations in several ways: 1) upon laying eggs, female cowbirds dispose of one or more host eggs; 2) the thick eggs of cowbirds often break the host eggs when laid; 3) cowbird eggs hatch earlier than host eggs; and 4) cowbird young are larger than host young and grow faster, beg louder, and have larger gapes (Robinson *et al.* 1992).

Detrimental effects of cowbird parasitism have increased throughout the Southwest and these effects are directly associated with settlement of the west. Development of livestock and agricultural operations have allowed expansion of brown-headed cowbird habitat by providing feeding areas where grazing livestock concentrate. Livestock feedlots, dairy operations, ranch headquarters, and other agricultural operations where grains and forage are fed to livestock provide food sources near host species nesting habitats (Hanna 1928, Mayfield 1977). Other human attractants to cowbirds also include bird feeders, lawns, golf courses, and agricultural fields.

The expansion of agriculture, livestock grazing, and widespread human activities have caused fragmentation of forest and woodland habitats. Habitat fragmentation has been documented to increase edge effects, increasing the potential for predation, including parasitism by the brown-headed cowbird. Riparian habitats in the Southwest are linear and naturally have a high amount of edge (Spencer *et al.* 1996). Tall, dense, impenetrable vegetation and large patch sizes will minimize the ability of cowbirds to see down through the canopy or in from the edge, and this may reduce parasitism rates.

The distance cowbirds travel from feeding areas to riparian areas where females lay their eggs vary among sites, depending on numerous factors, including cowbird attracting activities on surrounding lands, location and abundance of suitable feeding areas in relation to suitable breeding and egg laying areas, land ownership patterns, and other factors. Due to variability in cowbird traveling distances and lack of research specific to the Southwest, there is considerable controversy on designating a set distance in which cowbird parasitism is considered a concern. However, for this guidance document, a set distance in which to evaluate the possibility of cowbird parasitism as related to livestock grazing is required. After reviews of the literature and discussions with experts on cowbird behavior in the Southwest, the Southwestern Willow Flycatcher Recovery Team determined that restricting livestock activities within 2 mi of an occupied site during the critical season would remove the majority of threat of cowbird parasitism. As the Southwestern Willow Flycatcher Recovery Team's guidelines are applied and results are monitored, the 2-mile criterion may change. This may precipitate a need to re-evaluate any effects determinations made in this guidance document.

Trapping brown-headed cowbirds has been documented to reduce parasitism rates on the flycatcher and other host species. On the Kern River in California, parasitism rates dropped from between 50-80% to below 10% after the implementation of a trapping program (Whitfield 1993, Spencer *et al.* 1996).

Poor watershed conditions in the uplands can have adverse indirect effects on flycatcher habitat. Livestock grazing (as well as other activities such as timber harvesting, roads and trails construction, off-road-vehicle use, heavy recreational use in concentrated areas, large-scale fires, resource extraction, and other ground-disturbing activities) can contribute to poor watershed conditions. Such activities result in the removal of organic material on the soil surface. Removal of vegetation cover, in addition to compaction, decreases infiltration of the soil, which enhances surface runoff (U.S. Fish and Wildlife Service 1993b). Increased runoff in turn then results in increased silt loads, increased turbidity, decreased water quality, increased scouring during high flows, and altered pH levels. All of these impacts can have an indirect adverse effect to riparian areas, including flycatcher habitat.

Assessing the effects of various activities on the flycatcher requires consideration of the dynamic interactions within riparian ecosystems and their watersheds. Management of riparian ecosystems should consider their adaptation to flood events and the necessity of floods for regeneration of species like cottonwoods and willows. Fully functioning, healthy riparian ecosystems can readily absorb and quickly recover from relatively major flood events. Degraded systems cannot withstand flood events, and additional resource damage often occurs. Uplands degraded by overgrazing often promote surges that are flashier, with higher peak flows and reduced low flows. While flooding is very important to riparian habitat, unnaturally flashy flooding can be damaging and prevent further recruitment, particularly in degraded riparian systems.

DETERMINATIONS FOR THE SOUTHWESTERN WILLOW FLYCATCHER

No Effect

1. Livestock grazing on the allotment will not occur within any subwatershed that drains into southwestern willow flycatcher habitat.

May Affect, Not Likely to Adversely Affect (must meet all of the of the criteria)

1. Livestock use will not occur within 5 miles of occupied habitat during the breeding season, or will not occur within 2 miles if cowbird trapping and monitoring or an approved cowbird research program is in place.

2. Livestock grazing in unoccupied suitable habitat will not reduce the suitability, nor reduce the likelihood of suitable habitat to expand to the site's potential.

3. No livestock grazing will occur in potential habitat.

4. Subwatershed condition in the presence of livestock grazing will be maintained or improved and indicators of watershed health and TEP species habitat demonstrate that effects will be insignificant or discountable.

Forsman, E.D., E.C. Meslow and H.M. Wight. 1984. Distribution and biology of the spotted owl in Oregon. Wildlife Monographs 87:1-64.

Hayward, B., E.J. Heske, and C.W. Painter. 1997. Effects of livestock grazing on small mammals at a desert cienega. Journal of Wildlife Management 61(1):123-129.

U.S. Fish and Wildlife Service. 1993. Endangered and threatened wildlife and plants: Final rule to list the Mexican spotted owl as a threatened species. Federal Register 58:14248-14271.

U.S. Fish and Wildlife Service. 1995. Mexican spotted owl recovery plan. U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

Ward, J.P., Jr. and W.M. Block. 1995. Mexican spotted owl prey ecology. Chapter 5, *In*: U.S. Fish and Wildlife Service. Mexican Spotted Owl Recovery Plan, Vol. II. U.S. Fish and Wildlife Service, Albuquerque, NM.

SOUTHWESTERN WILLOW FLYCATCHER *(Empidonax traillii extimus)*

Bock, C.E., V.A. Saab, T.D. Rich and D.S. Dobkin. 1992. Effects of livestock grazing on neotropical migratory land birds in western North America. *In*: Finch, D.M. and P.W. Stangel, eds. Status and management of neotropical migratory birds. RM-GTR-229. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

Cooper, C.A. 1996. Summary of 1995 surveys for willow flycatchers in New Mexico. Contract no. 96-516.51. New Mexico Department of Game and Fish, Santa Fe.

Hannah, W.C. 1928. Notes on the dwarf cowbird in southern California. Condor 30:161-162.

Harris, J.H., S.D. Sanders and M.A. Flett. 1987. The status and distribution of the willow flycatcher (*Empidonax traillii*) in the Sierra Nevada. Administrative Report 87-2. Wildlife Management Branch, California Department of Fish and Game, Sacramento.

Hubbard, J. 1987. The status of the willow flycatcher in New Mexico. New Mexico Department of Game and Fish, Santa Fe. 29 pp.

Mayfield, H.F. 1977. Brown-headed cowbird: Agent of extermination? American Birds 31:107-113.

Maynard, W.R. 1994. Summary of 1994 survey efforts in New Mexico for southwestern willow flycatcher (Empidonax traillii extimus). Contract no. 94-515-69. New Mexico Department of Game and Fish, Santa Fe.

Paradzick C.E., R.F. Davidson, J.W. Rourke, M.W. Sumner, A.M. Wartell and T.D. McCarthey. 2000. Southwestern willow flycatcher 1999 survey and nest monitoring report. Nongame and Endangered Wildlife Technical Report 151. Arizona Game and Fish Department, Phoenix.

Parker, D. and T. Hull. 1995. The Gila valley revisited: 1995 survey results of willow flycatchers found along the Gila River, Gila and Cliff, Grant County, New Mexico. Applied Ecosystem Management, Flagstaff, Arizona. 25 pp.

Phillips, A.R. 1948. Geographic variation in *Empidonax traillii*. Auk 65:507-514.

Robinson, S.K., J.A. Grzybowski, S.I. Rothstein, M.C. Brittingham, L.J. Petit and F.R. Thompson. 1992. Management implications of cowbird parasitism on neotropical migrant songbirds. *In*: Finch, D.M. and P.W. Stangel, eds. Status and management of neotropical migratory birds. RM-GTR-229. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.

Sferra, S.J., R.A. Meyer and T.E. Corman. 1995. Arizona Partners in Flight 1994 southwestern willow flycatcher survey. Nongame and Endangered Wildlife Program Technical Report 69. Arizona Game and Fish Department, Phoenix.

Sogge, M. January 11, 1999. Draft southwestern willow flycatcher rangewide site summary database. U.S. Geological Survey Colorado Plateau Field Station, Flagstaff, Arizona.

Spencer, J.A., S. Sferra, T. Corman, J. Rourke and M. Sumner. 1996. Arizona Partners in Flight 1995 southwestern willow flycatcher survey. Draft Technical Report. Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix.

Swarth, H.S. 1914. A distributional list of the birds of Arizona. Pacific Coast Avifauna 10:1-133.

Unitt, P. 1987. Empidonax traillii extimus: An endangered subspecies. Western Birds 18(3):137-162.

U.S. Fish and Wildlife Service. 1993a. Threatened and endangered wildlife and plants: Proposed rule to list the southwestern willow flycatcher as endangered with critical habitat. Federal Register 58:39495-39522.

U.S. Fish and Wildlife Service. 1993b. Functions and values of the Verde River riparian ecosystem and an assessment of adverse impacts to these resources: A supporting document for the initiation of the Verde River advanced identification. Prepared for U.S. Environmental Protection Agency. 364 pp.