

**APPENDIX B - 2000 U.S. FISH AND WILDLIFE SERVICE  
BIOLOGICAL OPINION AND 2005 AMENDMENT**



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

IN REPLY REFER TO:  
1-1-01-I-0068

October 18, 2000

Mr. Mark Capik  
Acting Chief, Planning Division  
U.S. Army Corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, California 95814-2922

Subject: Clarification of the Biological Opinion on Long-term Operation of Isabella Dam and Reservoir (1-1-99-F-216)

Dear Mr. Capik:

This is in response to your October 5, 2000, email requesting clarification on the conditions for operations of the Reservoir water levels if the habitat protection measures are not completed. Specifically, our biological opinion, on page 40 states, "If the 1,100 acres is not permanently protected in 2000, the Corps would not bring water above 2,584-feet until the 1,100 acres is permanently protected." This is an incomplete assumption on our part.

We understood from your October 1999, project description, and our agreement, that until the 1,100 acres of habitat protection is completed, reservoir levels will not rise above 2,584-feet from March 1 to September 30 of each year. This is articulated on page 5 of the biological opinion under the project description section and was, therefore, considered in our analysis of the project. The assumption behind this intermittent inundation is also described on page 5 of the biological opinion and is based on breeding chronology of the southwestern willow flycatcher (*Empidonax traillii extimus*) and the physiology of the vegetation in the South Fork Wildlife Area above 2,584-feet.

We are available to assist you so please do not hesitate to contact Kenneth Sanchez of my staff at (916) 414-6625, if you have questions regarding this response.

Sincerely,

Karen J. Miller  
Chief, Endangered Species Division



# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

IN REPLY REFER TO:  
1-1-99-F-216

June 14, 2000

Colonel Michael J. Walsh  
District Engineer  
U.S. Army Corps of Engineers  
Sacramento District  
1325 J Street  
Sacramento, CA 95814-1999

Subject: Reinitiation of Formal Consultation on the Army Corps of Engineers  
Long-term Operation of Isabella Dam and Reservoir

Dear Colonel Walsh:

This is in response to the Corps of Engineers' (Corps) April 20, 1999, request for reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the routine operating procedures for anticipated future operations of Isabella Dam and Reservoir in Kern County, California. Your request was received in this office on April 22, 1999, and a complete project description and consultation package was received on October 13, 1999. This document represents the Service's biological opinion on the effects of the action on the southwestern willow flycatcher (*Empidonax traillii extimus*), (willow flycatcher) and its critical habitat, and the least Bell's vireo (*Vireo bellii pusillus*) (vireo) in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act).

You also requested our concurrence with your determination that the proposed action is not likely to adversely effect the bald eagle (*Haliaeetus leucocephalis*) and the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). We have reviewed the biological assessment transmitted with your correspondence and concur with this determination, providing the measures identified in this documentation are followed. Therefore, unless new information reveals effects of the proposed action that may affect these listed species in a manner or to an extent not considered, or a new species or critical habitat is designated that may be affected by the proposed action, no further action is necessary.

This biological opinion is based on the following information:

(1) the final rule listing the vireo (50 FR 16474);

- (2) the final rule listing the southwestern willow flycatcher (60 FR 10694);
- (3) the final rule designating critical habitat for the southwestern willow flycatcher (62 FR 3912) with correction (62 FR 44228);
- (4) the August 14, 1996, project description and biological assessment on the Corp's long-term operation of Isabella Reservoir;
- (5) the report titled, *A Brown-Headed Cowbird Control Program and Monitoring for the Southwestern Willow Flycatcher, South Fork Kern River, California, 1996* (Whitfield and Enos 1996);
- (6) the report titled, *Vegetation Mortality and Other Impacts Resulting from 1996 Operations at Lake Isabella* (Jones and Stokes 1997);
- (7) the April 18, 1997, Biological and Conference Opinion on the Corp's long-term operation of Isabella Reservoir (1-1-96-F-27);
- (8) the report titled, *1997 Brown-Headed Cowbird Monitoring, South Fork Kern River Valley* (Jones and Stokes 1998 a);
- (9) the report titled, *Reproductive Response of the Southwestern Willow Flycatcher to the Removal of Brown-Headed Cowbirds in 1997* (Whitfield et al. 1998);
- (10) the report titled, *Evaluate the Effects of Project Operation on Flycatcher Habitat - Describe Vegetation Mortality and Other Impacts Resulting from 1997 Operations* (Jones and Stokes 1998 b);
- (11) the report titled, *An Assessment of the Status and Habitat Use of Southwestern Willow Flycatchers in Relation to the Operation of Isabella Reservoir within the Kern River Valley* (del Nevo et al., 1998);
- (12) the report titled, *1997 Census for Southwestern Willow Flycatchers and Least Bell's Vireos-Summary Report* (Jones and Stokes 1998 c);
- (13) the report titled, *Existing and Potential Southwestern Willow Flycatcher Habitat in the Kern River Valley*, (Jones and Stokes 1998);
- (15) the report titled *Reproductive Response of the Southwestern Willow Flycatcher to the Removal of Brown-Headed Cowbirds in 1998* (Whitfield and Enos 1998);
- (16) the report titled, *Evaluation of the Effects of 1997 and 1998 Isabella Dam and Lake Operations on Riparian Vegetation* (Jones and Stokes 1999 a);

(17) the October 1999, revised project description for Isabella Dam and lake - routine operating procedures for anticipated future operations;

(18) September 1999, Draft Environmental Assessment for Protection of 1,100 Acres Upstream of Isabella Dam and Lake;

(20) the report titled, *Southwestern Willow Flycatcher Surveys, Nest Monitoring, and the Removal of Brown-Headed Cowbirds, on the South Fork Kern River, California in 1999* (Whitfield, et al. 1999);

(21) the report titled, *1998 Southwestern Willow Flycatcher and Least Bell's Vireo Censuses* (Jones and Stokes 1999 b);

(22) the report titled, *Brown-Headed Cowbird Monitoring, 1998*, (Jones and Stokes 1999 c);

(23) file information and reference material located at the Service's Sacramento Fish and Wildlife Office; and

(24) personal communications between Sacramento Fish and Wildlife Office staff and the Service's Albuquerque and Phoenix Fish and Wildlife Office, the U.S. Forest Service, the Kern River Research Center, The Nature Conservancy, the Corps, and the Kern River Watermaster.

An administrative record of this consultation is on file in the Sacramento Fish and Wildlife Office, Sacramento, California.

### **Consultation History**

**On May 16, 1996**, the Service issued a biological opinion addressing the effects of the 1996 water year (October 1995 through September 1996) Isabella Reservoir operations on the southwestern willow flycatcher and its proposed critical habitat (1-1-96-F-27).

**On November 20, 1996**, the Service met with the Corps to discuss impact analysis for the section 7 consultation on long-term operations. At this meeting, the Service indicated that, based on the best scientific information available, additional measures, beyond those included in the 1996 project description and biological opinion for 1996 operations, would be necessary to minimize impacts to listed species. Outstanding unresolved issues between the Corps and the Service led to an elevation of the section 7 consultation to the respective agency representatives in Washington, D.C. The Council on Environmental Quality was briefed by both agencies.

**On February 4, 1997**, an inter-agency strategy and agreement (Interagency Agreement) was developed and signed by representatives of the Service and Corps and was incorporated as a part of the project description for the consultation for long-term operations to resolve these outstanding issues. The strategy included a program to be implemented cooperatively to

minimize the effects of long-term Reservoir operations on the southwestern willow flycatcher and its habitat within the gross pool.

**On April 18, 1997**, the Service issued the biological and conference opinion on the long-term operation of Isabella Reservoir and Dam (1-1-96-150).

**On July 22, 1997**, critical habitat was designated for the willow flycatcher (62 FR 3912) with a correction published on **August 20, 1997**, (62 FR 44228).

**On August 6, 1997**, the Service agreed to the Corps request to adopt our conference opinion as a formal biological opinion for critical habitat (1-1-97-I-1876).

As part of the Interagency Agreement the Service appointed a sub committee of the southwestern willow flycatcher recovery team to frame critical questions relating to southwestern willow flycatchers and their habitat within the project vicinity. Their report was finalized on **June 22, 1998**, (del Nevo *et al.*).

After review of the best available information, the Service determined it was necessary to protect a total of 1,100 acres of habitat to minimize the effects of future Reservoir operations. The Corps in cooperation with the National Fish and Wildlife Foundation (NFWF) and the National Audubon Society has allocated \$3.8 million for the acquisition and/or easement and management of the 1,100 acres. Should additional funds be necessary, the Corps has requested these funds through the FY 2000 budgetary process. The Corps, with their partner NFWF are negotiating for the purchase of the 1,100 acres.

As part of the Interagency Agreement, the Corps agreed to protect, in 1997, 360 acres of southwestern willow flycatcher habitat upstream of Lake Isabella. The Corps was not able to complete this protection measure in 1997 and on **February 2, 1998**, the Corps notified the Service in writing of the status of the protection efforts. The Corps requested we amend our biological opinion to reflect the delay in implementation of the protection of 360 acres. On February 2, 1998, the Service responded with an amendment to our biological opinion (1-1-98-I-674).

**On October 24, 1997**, the Southwest Center for Biodiversity (Plaintiff) served the United States Attorney with a summons and complaint alleging the Corps and Service violated the Endangered Species Act, the National Environmental Policy Act, the Federal Advisory Committee Act and the Migratory Bird Treaty Act in connection with our biological opinion on the long-term operation of Isabella Reservoir. The plaintiffs challenged the validity of our biological opinion.

**On April 1, 1999**, Judge Garland Burrell, Jr. of the Eastern District Court of California granted the Plaintiffs injunctive relief, "against the Corp's filling of the reservoir above 2,584 feet, with the injunction continuing until such time as the Federal Defendants's reinitiate formal consultation." The court found, "the Federal Defendants incorporated the amendment into the

1997 BO without examining the relevant data and articulating a satisfactory explanation for their action, including a rational connection between the facts found and the choice made.”

On April 20, 1999, the Corps requested reinitiation of consultation and on October 8, 1999, a complete consultation package was received.

## BIOLOGICAL OPINION

### Description of the Proposed Action

The purpose of this reinitiation is to address the effects of the long-term operation of Isabella Reservoir and Dam and the delay of implementation of the protection measures, specifically protection of 1,100 acres of flycatcher habitat in the South Fork Kern River valley. All measures proposed by the Corps in your August 14, 1996, project description and outlined in our February 4, 1997, Interagency Agreement, remain unchanged. However, the Corps is proposing to implement interim measures to compensate for the delay in implementation of the 1,100 acres of protection. The description of the proposed action is detailed in your October 1999, project description. The Service's April 18, 1997, biological opinion is amended with this biological opinion.

The Corps and its partner NFWF are currently negotiating the purchase of the 1,100 acres to comply with the Interagency Agreement, the August 14, 1996, project description and biological assessment, and our April 18, 1997, biological opinion. Several landowners have indicated a willingness to sell property that has been approved by the Service as suitable habitat for the flycatcher. However, these types of land acquisition negotiations require time to complete appraisals, evaluations, and escrow and the outcome is uncertain.

To address the time constraint issue, the Corps is proposing to implement a set of “interim measures” for a period of 12 months beginning March 1, 2000, if the purchase of 1,100 acres is not completed by that time. With implementation of these interim measures for one year or with purchase in fee or permanent easement of 1,100 acres, the Corps proposes to manage the reservoir according to the project description evaluated in our April 18, 1997, biological opinion (*i.e.*, consistent with historical operations).

If the interim measures or the purchase of 1,100 acres are not completed by March 1, 2000, the Corps will not allow the reservoir to rise above 2,584 feet in elevation (inundate the South Fork Wildlife Area (SFWA)) for the period of March 1 through September 30 each year until the land is purchased or a permanent conservation easement is in place. The period of March 1 through September 30 was selected based on the growing season of the willow-cottonwood forest and the breeding chronology of willow flycatchers in the SFWA. This time period would allow for the vegetation in the SFWA to develop sufficiently to provide the characteristics necessary for flycatcher breeding habitat when the birds arrive May and later depart in September. If the Corps

is not able to negotiate a "willing-seller" purchase of fee title or easement of 1,100 acres, then the Corps would likely reinitiate consultation to explore other alternatives to manage the Reservoir for storage and delivery capabilities and to avoid long term impacts to willow flycatcher habitat within the Reservoir pool.

The interim measures include 1) flycatcher management and monitoring, 2) cowbird trapping, 3) exotic plant removal, 4) livestock management/removal of livestock, and 5) fence construction. Detailed descriptions of these interim measures can be found in the Corp's October, 1999, project description.

A detailed description of routine operating procedures for anticipated future operations of Isabella Dam and Reservoir can be found in the Corp's October 1999, project description and, except for the interim measures, remains unchanged from the August 14, 1996, project description. Our 1997 biological opinion addressed "unanticipated future operations" which outlined when additional measures to minimize impacts to listed species are necessary and operations which will require reinitiation of consultation. The following sections, *Unanticipated Future Operations* and *Implementation of the Additional Increments* are amended from our 1997 biological opinion.

#### Unanticipated Future Operations

Unanticipated future reservoir operations consistent with the authorized purposes of the project and the 1964 Agreement, but not included in the forecast developed from the modeled (1894-1953) and historic (1954-1997) operations of Isabella Reservoir, were considered as part of the assessment of the proposed operation of Isabella Reservoir in our April 18, 1997, biological opinion. However, based on additional information now available to the Service (*i.e.*, the various reports prepared by Jones & Stokes, Whitfield *et al.*, and del Nevo *et al.*) we believe the incremental impacts described in Tables 2 and 3 of the 1997, biological opinion would be fully minimized with protection and management of 1,100 acres, as well as the other measures proposed by the Corps, thus, additional measures would not be necessary. Therefore, Tables 2 and 3 from the 1997 biological opinion are not used or referenced in this biological opinion. However, the Service believes Table 1 (Table 4 in our 1997, biological opinion) still reflects the point at which impacts not addressed in our biological opinion would occur and reinitiation would be necessary. By all accounts (*i.e.*, historical operations) the scenario outlined in Table 1 is highly unlikely to occur and reinitiation is unlikely.

#### Reinitiation of Consultation

The Corps, in consultation with the Watermaster, will use the early March forecast of Isabella Reservoir operations (based on the forecasts of the National Weather Service, the California Department of Water Resources, and the Kern River Watermaster, as well as any additional information available to the Corps) and a 50 percent exceedance probability to determine if the water year will result in the highlighted value in Table 1 being reached. In the extremely unlikely

event the triggering value in Table 1 is reached (*i.e.*, a seventh year out of ten at or above 2,600 feet during the March to September growing season), the Corps will reinitiate formal section 7 consultation with the Service.

## Status of the Species/Environmental Baseline

### Southwestern willow flycatcher

The Service included the willow flycatcher on its Animal Notice of Review as a category 2 candidate species on January 6, 1989, (54 FR 554). The species was proposed for listing as endangered, with critical habitat on July 23, 1993, (58 FR 39495). A final rule listing the willow flycatcher as endangered was published on February 27, 1995, (60 FR 10694). The listing became effective on March 29, 1995. Critical habitat was designated for the willow flycatcher on **July 22, 1997**, (62 FR 3912) with correction on **August 20, 1997**, (62 FR 44228). Eighteen critical habitat units totaling 599 river miles in Arizona, California, and New Mexico were designated (USFWS 1997). The States of California, Arizona, and New Mexico also list the willow flycatcher as endangered (California Department of Fish and Game 1992, Arizona Game and Fish Department 1988, New Mexico Department of Game and Fish 1988).

The willow flycatcher is a small grayish-green passerine bird (Order Passeriformes; Family Tyrannidae) measuring approximately 14.6 centimeters (5.75 inches) in length from the tip of the bill to the tip of the tail and weighing only 11 grams (0.4 ounces). It has a grayish-green back and wings, whitish throat, light gray-olive breast, and pale yellowish belly. Two white wingbars are visible (juveniles have buffy wingbars). The eye ring is faint or absent. The upper mandible is dark, the lower is light yellow grading to black at the tip. The song is a sneezy "fitz-bew" or a "fit-a-bew," the call is a repeated "whitt."

One of four currently-recognized willow flycatcher subspecies (Phillips 1948, Unitt 1987, Browning 1993), the willow flycatcher is a neotropical migrant that breeds in the southwestern U.S. and migrates to Mexico, Central America, and possibly northern South America during the non-breeding season (Phillips 1948, Stiles and Skutch 1989, Peterson 1990, Ridgely and Tudor 1994, Howell and Webb 1995). The historical range of the willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987).

The willow flycatcher is a riparian obligate, nesting along rivers, streams, and other wetlands where dense growths of willow (*Salix* sp.), *Baccharis*, buttonbush (*Cephalanthus* sp.), boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.) or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.) and/or willow. These riparian communities provide nesting, foraging, and migratory habitat for the flycatcher.

This species is an insectivore, typically perching on a branch and making short direct flights, or sallying, to capture flying insects. Drost *et al.* (1998) found that the major prey items of the

willow flycatcher, from 15 sites in Arizona and Colorado, consisted of true flies (Diptera); ants, bees, and wasps (Hymenoptera); and true bugs (Hemiptera). Other insect prey taxa included leafhoppers (Homoptera: Cicadellidae); dragonflies and Damselflies (Odonata); and caterpillars (Lepidoptera larvae). Non-insect prey included spiders (Araneae), sowbugs (Isopoda), and fragments of plant material. Drost noted significant differences in dietary items based on sites and habitats.

### Habitat

The willow flycatcher breeds in dense riparian habitats from sea level in California to over 7,000 feet in Arizona and southwestern Colorado. Throughout its wide geographic and elevational range, its riparian habitat can be broadly described based on plant species composition and habitat structure (Sogge *et al.* 1997). Two components that vary less across this subspecies' range are vegetation density and the presence of surface water. Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types can be described for the willow flycatcher. Those types are described below and should be referenced with photographs provided in Sogge *et al.* (1997).

**Monotypic willow:** Nearly monotypic, dense stands of willow (often *S. exigua* or *S. geyeriana*) 3 to 7 meters in height with no distinct overstory layer; usually very dense structure in at least lower 2 m; live foliage density is high from the ground to canopy. In the South Fork Kern River both red willow (*S. Laevigata*) and black willow (*S. Gooddingii*) form monotypic stands of habitat used by willow flycatchers.

**Monotypic exotic:** Nearly monotypic, dense stands of exotics such as saltcedar (*Tamarix* sp.) or Russian olive (*Elaeagnus angustifolia*) 4 to 10 meters (m) in height forming a nearly continuous, closed canopy (with no distinct canopy layer); lower 2 m may be very difficult to penetrate due to branch density; however live foliage volume may be relatively low from 1 to 2 m above ground; canopy density uniformly high.

**Native broadleaf dominated:** Comprised of dense stands of single species (often Goodding's or other willows) or mixtures of native broadleaf trees and shrubs including, but not limited to, cottonwood, willows, boxelder, ash, buttonbush, and stinging nettle from 4 to 15 m in height; characterized by trees of different size classes; may have distinct overstory of cottonwood, willow or other broadleaf species, with recognizable subcanopy layers and a dense understory of mixed species; exotic/introduced species may be a rare component, particularly in understory. In the South Fork Kern River understory density can vary from dense to sparse depending on overstory density, soil type, hydrology, or microclimate.

**Mixed native/exotic:** Dense mixtures of native broadleaf trees and shrubs (such as those listed above) mixed with exotic species such as tamarisk and Russian olive; exotics are often primarily in the understory, but may also be a component of overstory; the native and exotic components may be dispersed throughout the habitat or concentrated as a distinct patch within a larger matrix

of habitat; overall, a particular site may be dominated primarily by natives, exotics, or be a more or less equal mixture.

Open water, cienegas, marshy seeps, or saturated soil are typically in the vicinity of flycatcher territories and nests; flycatchers sometimes nest in areas where nesting substrates were in standing water (Maynard 1995, Sferra *et al.* 1995, 1997). However, hydrological conditions at a particular site can vary remarkably in the arid Southwest within a season and between years. At some locations, particularly during drier years, water or saturated soil is only present early in the breeding season (*i.e.*, May and part of June). However, the total absence of water or visibly saturated soil has been documented at several sites where the river channel has been modified (*e.g.*, creation of pilot channels), where modification of subsurface flows has occurred (*e.g.*, agricultural runoff), or as a result of changes in river channel configuration after flood events (Spencer *et al.* 1996).

### Breeding Biology

The willow flycatcher begins arriving on breeding grounds in late April and May (Sogge and Tibbitts 1992, Sogge *et al.* 1993, Sogge and Tibbitts 1994, Muiznieks *et al.* 1994, Maynard 1995, Sferra *et al.* 1995, 1997). Nesting begins in late May and early June and young fledge from late June through mid-August (Willard 1912, Ligon 1961, Brown 1988a,b, Whitfield 1990, Sogge and Tibbitts 1992, Sogge *et al.* 1993, Muiznieks *et al.* 1994, Whitfield 1994, Maynard 1995). Willow flycatchers typically lay three to four eggs in a clutch (range = 2-5). The breeding cycle, from laying of the first egg to fledging, is approximately 28 days. Eggs are laid at one-day intervals (Bent 1963, Walkinshaw 1966, McCabe 1991); they are incubated by the female for approximately 12 days; and young fledge approximately 12 to 13 days after hatching (King 1955, Harrison 1979). Flycatchers typically raise one brood per year but have been documented raising two broods during one season (Whitfield 1990). They have also been documented reneesting after nest failure (Whitfield 1990, Sogge and Tibbitts 1992, Sogge *et al.* 1993, Sogge and Tibbitts 1994, Muiznieks *et al.* 1994, Whitfield 1994, Whitfield and Strong 1995).

Flycatcher nests are open cup structures, approximately 8 cm high and 8 cm wide (outside dimensions), exclusive of any dangling material at the bottom. Nests are typically placed in the fork of a branch with the nest cup supported by several small-diameter vertical stems. The main branch from which the fork originates may be oriented vertically, horizontally, or at an angle, and stem diameter for the main supporting branch can be as small as 3 to 4 cm. Vertical stems supporting the nest cup are typically 1 to 2 cm in diameter. Occasionally, willow flycatchers place their nests at the juncture of stems from separate plants, sometimes different plant species. Those nests are also characterized by vertically-oriented stems supporting the nest cup. Spencer *et al.* (1996) measured the distance between flycatcher nests and shrub/tree center for 38 nests in monotypic saltcedar and mixed native broadleaf/saltcedar habitats. In monotypic saltcedar stands (n=31), nest placement varied from 0.0 m (center stem of shrub or tree) to 2.5 m. In the mixed riparian habitat (n=7), nest placement varied from 0.0 to 3.3 m.

Height of the nest varies across the willow flycatcher's range and may be correlated with the species and height of nest substrate, foliage densities, and/or overall canopy height. Flycatcher nests have been found as low as 0.6 m above the ground to 18 m above the ground. Flycatchers using predominantly native broadleaf riparian habitats nest relatively low to the ground (between 1.8 m and 2.1 m on average), whereas those using mixed native/exotic and monotypic exotic riparian habitats nest relatively high above the ground (between 4.3 m and 7.4 m on average).

Historic egg/nest collections and species' descriptions from throughout the willow flycatcher's range confirm the bird's widespread use of willow for nesting (Phillips 1948, Phillips *et al.* 1964, Hubbard 1987, Unitt 1987, T. Huels *in litt.* 1993, San Diego Natural History Museum 1995). Currently, willow flycatchers use a wide variety of plant species for nesting substrates primarily including willows (*Salix gooddingii*, *S. lasiandra*, and *S. laevigata*), boxelder (*Acer negundo*), saltcedar (*Tamarisk spp.*), Russian olive (*Olea europea*) and live oak (*Quercus chrysolepis*), and nettles (*Urtica dioica*) (Whitfield *et al.* 1997, 1999b). Other plant species that willow flycatcher nests have been documented in include: buttonbush (*Cephalanthus occidentalis*), black twinberry (*Lonicera involucrata*), Fremont cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), and blackberry (*Rubus ursinus*).

Brood parasitism of willow flycatcher nests by the brown-headed cowbird (*Molothrus ater*) has been documented throughout the flycatcher's range (Brown 1988a,b, Whitfield 1990, Muiznieks *et al.* 1994, Whitfield 1994, Hull and Parker 1995, Maynard 1995, Sferra *et al.* 1995, Sogge 1995b). Cowbirds lay their eggs in the nests of other species directly affecting their hosts by reducing nest success. Cowbird parasitism reduces host nest success in several ways. Cowbirds may remove some of the host's eggs, reducing overall fecundity. Hosts may abandon parasitized nests and attempt to renest, which can result in reduced clutch sizes, delayed fledging, and reduced overall nesting success and fledgling survivorship (Whitfield 1994, Whitfield and Strong 1995). Cowbird eggs, which require a shorter incubation period than those of many passerine hosts, hatch earlier giving cowbird nestlings a competitive advantage over the host's young for parental care (Bent 1963, McGreen 1972, Mayfield 1977a,b, Brittingham and Temple 1983). Where studied, high rates of cowbird parasitism have coincided with willow flycatcher population declines (Whitfield 1994, Sogge 1995a, Sogge 1995c, Whitfield and Strong 1995), or, at a minimum, resulted in reduced or complete elimination of nesting success (Muiznieks *et al.* 1994, Whitfield 1994, Maynard 1995, Sferra *et al.* 1995, Sogge 1995a, Sogge 1995c, Whitfield and Strong 1995). Whitfield and Strong (1995) found that flycatcher nestlings fledged after July 20th had a significantly lower return rate and that cowbird parasitism was often the cause of delayed fledging.

### Territory size

Flycatcher territory size, as defined by song locations of territorial birds, probably changes with population density, habitat quality, and nesting stage. Estimated territory sizes are 0.24-1.3 hectares (ha) for monogamous males and 1.1-2.3 ha for polygynous males at the Kern River

(Whitfield and Enos 1996), 0.06-.2 ha for bird in a 0.6-0.9 ha patches on the Colorado River (Sogge 1995c) and 0.2-0.5 ha in a 1.5 ha patch on the Verde River (Sogge 1995a).

### Reproductive Success

Intensive nest monitoring efforts in California, Arizona, and New Mexico have revealed that: (1) sites with both relatively large and small numbers of pairs have experienced extremely high rates of brood parasitism; (2) high levels of cowbird parasitism in combination with nest loss due to predation have resulted in low reproductive success and, in some cases, population declines; (3) at some sites, the level of cowbird parasitism remains high across years, while at others parasitism varies temporally with cowbirds absent in some years; (4) the probability of a willow flycatcher successfully fledging its own young from a nest that has been parasitized by cowbirds is low (*i.e.*, <5 percent); (5) cowbird parasitism and/or nest loss due to predation often result in reduced fecundity in subsequent nesting attempts, delayed fledging, and reduced survivorship of late-fledged young, and; (6) nest loss due to predation appears fairly consistent from year to year and across sites, generally in the range of 30 to 50 percent.

Nest loss due to predation is common among small passerines. The rates documented for willow flycatchers are also typical for small passerines (*i.e.*, rates < 50 percent). However, even at these "typical" levels, nest loss due to predation is a significant factor contributing to low reproductive success. Especially in a depressed population, nest predation presents a difficult management challenge because of the variety of predators. Documented predators of willow flycatcher nests identified to date include common king snake (*Lampropeltis getulus*) and Cooper's hawk (*Accipiter cooperii*) (McCarthy *et al.* 1998, Paxton *et al.* 1997). Common mammalian predators such as skunks and racoons are also expected to present a predation impact (M. Whitfield, pers. comm.). Efforts to reduce these common "urban adapted" predators may include restricting activities in flycatcher habitat that attract predators, such as camping, picnicking, *etc.* where pets are loose and refuse is concentrated.

The data presented above and in Table 2 demonstrate that cowbird parasitism and nest depredation are affecting willow flycatchers throughout their range. Cowbirds have been documented at more than 90 percent of sites surveyed (Sogge and Tibbitts 1992, Sogge *et al.* 1993, Camp Pendleton 1994, Muiznieks *et al.* 1994, Sogge and Tibbitts 1994, T. Ireland *in litt.* 1994, Whitfield 1994, C. Tomlinson *in litt.* 1995, Griffith and Griffith 1995, Holmgren and Collins 1995, Kus 1995, Maynard 1995, McDonald *et al.* 1995, Sferra *et al.* 1995, Sogge 1995b, San Diego Natural History Museum 1995, Stransky 1995, Whitfield and Strong 1995, Griffith and Griffith 1996, Skaggs 1995, Spencer *et al.* 1996, Whitfield and Enos 1996, Sferra *et al.* 1997, McCarthy *et al.* 1998). Thus, the potential for cowbirds to be a persistent and widespread threat remains high. Cowbird trapping has been demonstrated to be an effective management strategy for increasing reproductive success for the willow flycatcher as well as for other endangered passerines (*e.g.*, vireo [*Vireo bellii pusillus*], black-capped vireo [*V. atricapillus*], golden-cheeked warbler [*Dendroica chrysoparia*]). It may also benefit juvenile survivorship by increasing the probability that parents fledge birds early in the season.

Expansion of cowbird management programs has the potential to not only increase reproductive output and juvenile survivorship at source populations, but also to potentially convert small, sink populations into breeding groups that contribute to population growth and expansion.

### Rangewide Distribution and Abundance

Unitt (1987) documented the loss of more than 70 breeding locations rangewide, including locations along the periphery and within core drainages that form this subspecies range. Unitt estimated that the rangewide population probably was comprised of 500 to 1,000 pairs. The current known population of willow flycatchers stands at approximately 587 territories (Table 3). Breeding occurs at approximately 75 sites (Sogge *et al.* 1997).

The data presented in Table 3 represents both a summary of current survey data as well as a composite of surveys conducted since 1992. Locations with willow flycatchers present for only one year were tabulated as if the location is still extant. Given that extirpation has been documented at several locations during the survey period, this method of analysis introduces a bias that may overestimate the number of breeding groups and overall population size. In addition, females have been documented singing. Because the established survey method relies on singing birds (assumed to be male) as the entity defining a territory (Tibbitts *et al.* 1994), double-counting may be another source of sampling error that biases population estimates upward. The figure of 587 willow flycatcher territories is a preliminary rangewide estimate for 1997 and is an approximation based on considerable survey effort, both extensive and intensive. Given sampling errors that may bias population estimates positively or negatively (*e.g.*, incomplete survey effort, double-counting males/females, composite tabulation methodology), natural population fluctuation, and random events, it is likely that the total breeding population of willow flycatchers fluctuates between 350 and 550 pairs. A substantial proportion of individuals appear to remain unmated. At such low population levels, random demographic, environmental, and/or genetic events could lead to loss of breeding groups and the continued decline of the species. The high proportion of unmated individuals documented during recent survey efforts suggests the willow flycatcher may already be subject to a combination of these factors (*e.g.*, uneven sex ratios, low probability of finding mates in a highly fragmented landscape).

The results shown in Table 3 demonstrate the critical population status of the flycatcher. More than 75 percent of the locations where flycatchers have been found are comprised of 5 or fewer territorial birds. Approximately 20 percent of the locations are comprised of single, unmated individuals. The distribution of breeding groups is highly fragmented, with groups often separated by considerable distances (*e.g.*, approximately 88 kilometer straight-line distance between breeding flycatchers at Roosevelt Lake, Gila County, Arizona, and the next closest breeding groups known on either the San Pedro River (Pinal County) or Verde River (Yavapai County). Continued survey efforts may discover additional small breeding groups. To date, survey results reveal a consistent pattern rangewide; the willow flycatcher population as a whole is comprised of extremely small, widely-separated breeding groups including unmated individuals.

Declining numbers have been attributed to loss, modification, and fragmentation of riparian breeding habitat, loss of wintering habitat, and brood parasitism by the brown-headed cowbird (*Molothrus ater*) (McCarthy *et al.* 1998, Sogge *et al.* 1997). Habitat loss and degradation is caused by a variety of factors, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, and livestock grazing. Fire is an increasing threat to willow flycatcher habitat (Paxton *et al.* 1996). Fire frequency in riparian vegetation increases with dominance by saltcedar (DeLoach 1991), and water diversions or groundwater pumping that results in dessication of riparian vegetation (Sogge *et al.* 1997). The presence of livestock and range improvements such as waters and corrals; agriculture; urban areas such as golf courses, bird feeders, and trash areas may provide feeding sites for cowbirds. These feeding areas coupled with habitat fragmentation, facilitate cowbird parasitism of flycatcher nests (Tibbitts *et al.* 1994, Hanna 1928, Mayfield 1977a).

#### ARIZONA

Unitt (1987) concluded that probably the steepest decline in the population level of *E.t. extimus* has occurred in Arizona. Historic records for Arizona indicate the former range of the willow flycatcher included portions of all major river systems (Colorado, Salt, Verde, Gila, Santa Cruz, and San Pedro) and major tributaries, such as the Little Colorado River and headwaters, and White River.

As of 1997, 190 territories were known from 41 sites along 12 drainages statewide (Table 3). The majority of breeding groups in Arizona are extremely small; of the 41 sites where flycatchers have been documented, 80 percent (33) contain 5 or fewer territorial flycatchers. Moreover, 15 percent to 18 percent of all sites in Arizona are comprised of single, unmated territorial birds.

As reported by McCarthy *et al.* (1998), the greatest concentrations of willow flycatchers in Arizona in 1997 were near the confluence of the Gila and San Pedro Rivers (146 flycatchers, 76 territories); at the inflows of Roosevelt Lake (74 flycatchers, 39 territories); between Fort Thomas and Solomon on the middle Gila River (32 flycatchers, 18 territories); Topock Marsh on the Lower Colorado River (24 flycatchers, 12 territories); Verde River at Camp Verde (20 flycatchers, 10 territories); Alpine/Greer on the San Francisco River/Little Colorado River (16 flycatchers, 9 territories); and Alamo Lake on the Bill Williams River (includes Santa Maria and Big Sandy River sites) (16 flycatchers, 10 territories). The lowest elevation where territorial pairs were detected was 60 m at Adobe Lake on the Lower Colorado River. Nesting flycatchers were observed as low as 140 m at Topock Marsh and as high as 2,530 m at the Greer town site.

In 1997, nest success or failure was documented at 131 of the 171 nesting attempts at 28 sites in Arizona. Of the 135 nests, an estimated 160 flycatchers fledged. The nest failure rate was 48 percent. Causes of nest failure included predation (29 percent), brood parasitism (8 percent), nest abandonment (7 percent), and unknown causes (3 percent) (McCarthy *et al.* 1998). Thirty-one percent of all parasitized nests were subsequently abandoned. One nest in

Camp Verde, was parasitized, but successfully fledged at least one willow flycatcher. It is important to note that cowbird trapping programs occurred at seven of the monitored nest sites.

#### CALIFORNIA

The historic range of willow flycatchers in California apparently included all lowland riparian areas in the southern third of the state. It was considered a common breeder where suitable habitat existed (Wheelock 1912, Willard 1912, Willett 1933, Grinnell and Miller 1944). Unitt (1984, 1987) concluded that it was once common in the Los Angeles basin, the San Bernardino/Riverside area, and San Diego County. Specimen and egg/nest collections confirm its former distribution in all coastal counties from San Diego Co. to San Luis Obispo Co., as well as in the inland counties, Kern, Inyo, Mohave, San Bernardino, and Imperial. Unitt (1987) documented that the flycatcher had been extirpated, or virtually extirpated (*i.e.*, few territories remaining) from the Santa Clara River (Ventura Co.), Los Angeles River (Los Angeles Co.), Santa Ana River (Orange and Riverside counties), San Diego River (San Diego Co.), lower Colorado River (Imperial and Riverside counties and adjacent counties in Arizona), Owen's River (Inyo Co.), and the Mohave River (San Bernardino Co.). Its former abundance in California is evident in nests collected in Los Angeles County (n=12), and from Herbert Brown's 34 nests and 9 specimens collected from the lower Colorado River near Yuma. Local collections of this magnitude suggest that this subspecies was locally very abundant.

Survey and monitoring efforts since the late 1980s have confirmed the willow flycatcher's presence at 18 locations on 11 drainages in southern California (including Colorado River). Current known flycatcher breeding sites are restricted to four counties, San Diego, Riverside, Santa Barbara, and Kern. Combining survey data for all sites surveyed since the late 1980's for a composite population estimate, the total known willow flycatcher population in southern California is 130 territories (Table 3). Of the 23 sites where flycatchers have been documented, 74 percent (17) contain 5 or fewer territorial flycatchers, 17 per cent (4) contain 6 to 20 territories, and less than 1 per cent (2) contain greater than 20 territories. Only 3 drainages are known to have 20 or more flycatcher territories, the San Luis Rey River (San Diego Co.), South Fork Kern River (Kern Co.), and Santa Ynez River (Santa Barbara Co.).

Authorized (permitted) and unauthorized activities in riparian habitats continue to adversely affect occupied flycatcher habitat in southern California. For example, approximately one kilometer of occupied habitat on the Santa Ynez River in Santa Barbara County was modified or completely eliminated in 1996 when expansion of agricultural fields resulted in clearing of riparian vegetation (USFWS *in litt.*). Despite the vast potential for riparian habitat and willow flycatcher recovery on Camp Pendleton in San Diego County, a programmatic section 7 consultation resulted in a conservation target of 20 willow flycatcher pairs (Table 4). The Base currently has approximately 22 pairs of flycatchers, in contrast to the 348 pairs of the sympatric and endangered vireo (*Vireo bellii pusillus*), which increased from a low of 27 pairs in 1984. The Corps' operations at Isabella Reservoir will result in inundation of the 485-ha South Fork Wildlife Area, also designated critical habitat for the flycatcher. Recently the Wildlife Area has

not had a high number of nesting pairs of willow flycatchers , an average of 5 pairs for 7 years (Whitfield et al. 1999a). This is probably due to the unsuitable condition of the area because of inundation regimes as well as the low numbers of birds returning from the wintering grounds. However, the Wildlife Area represents a significant recovery area that has been occupied by up to 14 pairs and lies downstream of one of California's largest willow flycatcher breeding groups on the Kern River Preserve.

#### COLORADO

The taxonomic status and the historic distribution and abundance of willow flycatchers in southwestern Colorado remains unclear due to a lack of specimen data and breeding records. Preliminary data on song dialects suggests that the few birds recently documented in southwestern Colorado may be *E.t. extimus*. These sightings have prompted State and Federal agencies to delineate provisional boundaries for willow flycatchers and sponsor statewide survey efforts. Survey efforts since 1993 have documented a total of six locations in Delta, Mesa, and San Miguel counties where willow flycatchers have been found (Table 3). Two locations have single, unmated males; two locations have single pairs, and the remaining two locations are comprised of four to seven territories each.

On March 9, 1997, a fire started by an adjacent landowner burned a 32-hectare portion of the Escalante Wildlife Area near Delta, Colorado. That location comprised one of the largest known breeding sites for willow flycatchers in Colorado with approximately seven pairs occupying the site in 1996.

#### NEVADA

Unitt (1987) documented 3 locations in Clark County from which willow flycatchers had been collected, but not found after 1970. Current survey efforts have documented a single location with 2 unmated males on the Virgin River in Clark County (Tomlinson 1997.) (Table 3).

#### NEW MEXICO

Unitt (1987) considered New Mexico as the State with the greatest number of *E.t. extimus* remaining. After reviewing the historic status of the flycatcher and its riparian habitat in New Mexico, Hubbard (1987) concluded, [it] is virtually inescapable that a decrease has occurred in the population of breeding willow flycatchers in New Mexico over historic time. This is based on the fact that wooded sloughs and similar habitats have been widely eliminated along streams in New Mexico, largely as a result of the activities of humans in the area.

Unitt (1987), Hubbard (1987), and more recent survey efforts have documented extirpation or virtual extirpation in New Mexico on the San Juan River (San Juan Co.), near Zuni (McKinley Co.), Blue Water Creek (Cibola Co.), Rio Grande (Dona Ana Co. and Socorro Co.). Survey and

monitoring efforts since 1993 have documented 173 flycatcher territories on 8 drainages (Table 3). Approximately 135 of these territories occur in remnant strips of riparian forest within a 20-mile stretch of the Gila River in Grant County (Skaggs 1995). This area contains the largest known breeding group rangewide. In a letter responding to proposed critical habitat for the flycatcher, this part of the Gila River is characterized as being contained by flood-control levees that do not support the regeneration of riparian trees such as willow and cottonwood. Thus, under existing conditions, habitat suitable for the willow flycatcher is not regenerating and this largest population may be lost as a result. Outside of Grant County few flycatchers remain. Statewide, 84 percent (16) of the 19 sites with flycatchers contain 5 or fewer territorial birds. Six sites are comprised of single pairs or unmated territorial flycatchers, and six others are comprised of two pairs or two unmated territorial birds. --

## TEXAS

The Pecos and Rio Grande rivers in western Texas are considered the easternmost boundary for the willow flycatcher. Unitt (1987) found specimens from four locations in Brewster, Hudspeth, and Loving counties where the subspecies is no longer believed to be present. Landowner permission to survey riparian areas on private property has not been obtained, thus current, systematic survey data are not available for Texas. There have been no other recent reports, anecdotal or incidental, of willow flycatcher breeding attempts in the portion of western Texas where they occurred historically. Given that surveys in adjacent Dona Ana County, New Mexico, have failed to document breeding along historically-occupied portions of the Rio Grande, the Service believes it is likely that the willow flycatcher has been extirpated from Texas.

## UTAH

Specimen data reveal that willow flycatcher historically occurred in southern Utah along the Colorado River, San Juan River, Kanab Creek, Virgin River, and Santa Clara River (Unitt 1987). Their northern boundary in south-central Utah remains unclear due to a lack of specimen data from that region. The willow flycatcher no longer occurs along the Colorado River in Glen Canyon where Lake Powell inundated historically-occupied habitat, nor in unflooded portions of Glen Canyon near Lee's Ferry where willow flycatchers were documented nesting in 1938. Similarly, recent surveys on the Virgin River and tributaries and Kanab Creek have failed to document their presence (McDonald *et al.* 1995). Single, territorial males and possibly a pair of willow flycatchers were documented at two locations on the San Juan River (San Juan Co.) in 1995, but breeding was not confirmed (Sogge 1995b). The population totals for Utah are summarized in Table 3.

Since listing in 1995, 39 Federal agency actions have undergone section 7 consultation throughout the bird's range. Table 4 lists all Federal agency actions that have undergone consultation and the levels of incidental take permitted for the willow flycatcher rangewide since listing in 1995. As indicated in the table, many activities (urbanization, agriculture, brush

clearing, grazing, recreation, reservoir/dam operations, *etc.*) continue to adversely affect the distribution and extent of occupied and potential breeding habitat throughout the species range. Six actions have resulted in jeopardy decisions. Stochastic events also continue to adversely affect the distribution and extent of occupied and potential breeding habitat. A catastrophic fire in June of 1996, destroyed approximately 1 linear km. of occupied habitat on the San Pedro River in Pinal County. That fire resulted in the forced dispersal or loss of up to 8 pairs of flycatchers (Paxton *et al.* 1996).

To date, survey results reveal a consistent pattern rangewide; the willow flycatcher population, as a whole, is comprised of extremely small, widely-separated breeding groups including unmated individuals (Table 3). More than 75 percent of the locations where flycatchers have been found are comprised of five or fewer territorial birds. Approximately 20 percent of the locations are comprised of single, unmated individuals. The distribution of breeding groups is highly fragmented, with groups often separated by considerable distances (*e.g.* approximately 88 kilometer straight-line distance between breeding flycatchers at Roosevelt Lake, Gila Co., Arizona, and the next closest breeding groups known on either the San Pedro River, Pinal Co. or Verde River, Yavapai Co.). Continued survey efforts may discover additional small breeding groups.

Due to the highly fragmented nature and low numbers of the bird, disturbance to the bird and its breeding activities, and continued loss of habitat or potential habitat can cause additional decline and impede recovery. Repeated human entry to nest areas may attract ground predators and increase predation (or parasitism) of nests. Concentrated human activity in riparian areas may increase disturbance to nesting. Firewood cutting, off-road vehicle use, and other seemingly benign human activities could decrease existing habitat, habitat regeneration, and/or nest success.

Because of the low numbers of the bird, the effects of management and research activities are a concern. Survey and nest monitoring activities, and handling and banding procedures are regulated by Federal and State permitting processes to remove and reduce effects to the bird. Specific training in standardized survey and monitoring procedures are required throughout its range.

#### Status of the Species in the South Fork Kern River

The population of willow flycatchers in and immediately adjacent to Isabella Reservoir is one of the largest known populations of this species. Whitfield *et al.* (1999) documented a precipitous decline (from 44 to only 23 pairs) in the studied breeding flycatcher population in areas surveyed along the South Fork Kern River from 1989 to 1999. From 1989 to 1992, cowbird parasitism rates were between 50 and 80 percent (Whitfield 1993). A cowbird trapping program initiated in 1992 and from 1994 to 1998 cowbird parasitism rates have been reduced to 13.4 percent (Whitfield *et al.* 1999). While the trend of a decreasing number of nesting pairs in this 10 year period is apparent, the efforts to reduce cowbird parasitism have resulted in an increased nest success. Table 5 shows the surveyed breeding population size and nesting success from 1989

through 1999 based on surveys carried out by the Kern River Research Center on portions of the South Fork Kern River (including the Wildlife Area), directly upstream of Isabella Reservoir. Whitfield and Strong (1995) expressed concerns that there are other factors besides cowbird parasitism depressing numbers of adult flycatchers in this population, such as habitat loss (*i.e.*, wintering and/or migratory stopover sites), pesticide use, or chance events (*e.g.*, mortality due to storms during migration).

This population has been repeatedly affected by inundation from rising water levels in Isabella Reservoir. In 1995, approximately 34 pairs were documented to be breeding (Whitfield and Strong 1995); a total of 32 nests were monitored in their study areas. Additional nests were located outside of the study sites, but data on nest success were not collected (Laymon, pers. comm. 1996, Whitfield, pers. comm. 1996). Of the studied nests, 16 nests were located at the SFWA; four of these nests were inundated by the reservoir and three were moved by researchers out of the way of approaching water. This effort was only partly successful; one nest succeeded in fledging two young and the other two nests were depredated. Water operations in 1996, 1997, and 1998, inundated the SFWA during a significant portion of the breeding season. In 1996 two flycatcher pairs attempted to nest in this area but only one flycatcher pair was successful and in subsequent years no birds nested in the Wildlife Area.

During years in which flycatchers utilize habitat prior to a water elevation rise, a "reproductive trap" is created. Conversely, problems associated with water elevation rises prior to the breeding season are also realized; both are described in the **Effects of Proposed Action** section. Maps of nest clusters (Whitfield 1994, Whitfield and Strong 1995, Whitfield and Enos 1996) indicate that the sites utilized in 1993 and 1994 were abandoned in 1995 and 1996. Whether this is due to inundation, decreases in food supply, changes to micro-habitat structure, or other factors is unknown.

Given the limited extent of suitable habitat upstream, inundation of portions of the SFWA and Kern River Preserve may be reducing the amount of habitat that is available and suitable, causing displacement of willow flycatchers. During periods of high flows on the South Fork Kern River and high reservoir levels, inundation of the Kern River Preserve may occur and may be exacerbated by the combination of these two factors. Conflicting data are available regarding the effects of inundation on habitat suitability and availability. While Whitfield and Enos (1996) state that there are no apparent changes in habitat, Jones and Stokes Associates, Inc. (1998b, 1999) describe mortalities ranging from 33 per cent from between 2,580 to 2,585 feet to 100 per cent below 2,570 feet. Whitfield and Enos (1996) suggest that further studies are necessary to determine whether there are measurable differences in insect abundance or vegetation structure between sites that are abandoned versus utilized. Despite the uncertainty on why willow flycatchers are utilizing certain areas more often than other sites, it appears clear that chronic mortality of habitat from repeated and consecutive inundation of some, if not all, of the SFWA, during the breeding season, represents a reduction in the amount of habitat that is available and suitable. While Whitfield and Enos (1996) suggest that habitat quality and quantity is not currently a limiting factor for this population, these factors become more important when project

impacts are analyzed over the long-term (*i.e.*, life of project) as is necessary within the scope of this section 7 consultation.

It is also clear that periodic flooding of the wildlife area may be necessary to maintain dense stands of riparian vegetation. However, this flooding should be timed according to the biological factors of flycatcher nesting chronology and plant physiology in order to be considered "beneficial" to willow flycatchers. Historically, flooding occurred according to Reservoir management requirements (irrigation demands) and resulted in adverse impacts to willow flycatchers and their habitat rather than according to the biological requirements of the species.

### **Critical Habitat**

#### Southwestern willow flycatcher

Critical habitat was designated on July 22, 1997, to provide additional protection for areas (occupied and unoccupied) necessary for the survival and recovery of this species (62 FR 3912). Critical habitat was designated for the willow flycatcher along 18 critical habitat units totaling 599 river miles in California, Arizona and New Mexico. The lateral extent of designated critical habitat is... "within 100 meters of the edge of areas with surface water during the May to September breeding season and within 100 meters of the areas where such surface water no longer exists owing to habitat degradation but may be recovered with habitat rehabilitation. This includes areas with thickets, riparian trees and shrubs, and areas where such riparian vegetation does not currently exist, but may be established with natural regeneration or habitat rehabilitation". Critical habitat was not designated in Colorado, Nevada, Texas, or Utah. Habitat types and State status are described in detail above in Status of Species section. In California, the following areas are designated as critical habitat:

- Santa Ana River, Approximately 16 miles (25 km), Riverside and San Bernardino Counties
- San Luis Rey River, Approximately 24 miles (39 km), San Diego County
- Santa Margarita River, Approximately 20 miles (33 km), San Diego County
- San Diego River, Approximately 20.5 miles (35 km), San Diego County
- Tijuana River, Approximately 3.3 miles (5.5 km), San Diego County
- San Dieguito River, Approximately 15 miles (24 km), San Diego County
- South Fork of the Kern River from the confluence of Canebreak Creek downstream to a line running north-south between Lyme Dyke and Lime Point encompassing the SFWA, Approximately 16 miles (26 km), Kern County Areas were chosen because they contain

the remaining known willow flycatcher nesting sites, and/or formerly supported nesting willow flycatcher, and/or have the potential to support nesting willow flycatchers (62 FR 3912). Because the willow flycatcher is already extirpated from a significant portion of its former range, protection of this proposed critical habitat is essential for the conservation of the species (62 FR 3912). The Service designated as critical habitat, areas which provide, or with rehabilitation will provide, the following physical and biological features and primary constituent elements (62 FR 3912):

- Space for individual and population growth;
- Food, water, air, light, minerals, and other nutritional or physiological requirements;
- Cover or shelter;
- Sites for breeding, reproduction, and rearing of offspring, germination or seed dispersal; and
- Habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of the species.

Adverse modification include activities such as (62 FR 3912):

- Removing, thinning, or destroying riparian vegetation.
- Surface water diversion or impoundment, groundwater pumping, or any other activity which may alter the quantity or quality of surface or subsurface water flow.
- Destruction/alteration of the species' habitat by discharge of fill material, draining, ditching, tiling, pond construction, and stream channelization (*i.e.* due to roads, construction of bridges, impoundments, discharge pipes, stormwater detention basins, *etc.*).
- Overstocking of livestock.
- Development of recreational facilities and off-road vehicle operation.

*Designated Critical Habitat in the Project Area:*

The South Fork Kern River supports one of the largest contiguous riparian forests in the State, encompassing over 2,400 acres (1,000 hectares); this forest is one of the best remaining examples of a native deciduous riparian system in California. The dominant vegetation is mature willows (*Salix gooddingii*, *S. lasiandra*, and *S. laevigata*) and Fremont cottonwood (*Populus fremontii*). Included in this riparian corridor are two areas of suitable habitat with known nesting pairs of flycatchers; the Kern River Preserve, which is owned and managed by The Audubon Society, and

the SFWA. Outside and upstream of the SFWA and the Preserve in private ownership are approximately 1,400 acres of willow/cottonwood forest that appear to be suitable flycatcher habitat and likely support low numbers of flycatchers due to their degraded condition caused by grazing and clearing.

The SFWA, as delineated by historic Patterson Lane (at approximately 2,584 ft. elevation), is a 1,270-acre wildlife area within the gross pool of Isabella Reservoir. In 1988, the Corps granted the California Department of Fish and Game (CDFG) a 20-year renewable license to manage the SFWA. In 1990, CDFG produced a draft 10-year management plan for this area which focused on developing wetland habitat types to increase the amount and quality of nesting and foraging habitat during the summer months for the willow flycatcher. In 1991, responsibility for managing the SFWA was transferred from the Corps to the U.S. Forest Service. CDFG's draft management plan for the area was forwarded to the Forest Service for implementation. The Kern River Preserve is located immediately east of the SFWA. Surrounding property on three sides is in private ownership.

Whitfield (pers. comm. 1996) observed a pair of flycatchers west of Patterson Lane outside of the Wildlife Area in 1992. Limited surveys documented use of this vegetation by a territorial male, and a nest was suspected to have been established but destroyed by grazing cattle. This habitat, which is comprised of willow thickets, is subject to frequent and prolonged inundation due to its location, which ranges from approximately 2,570 to 2,584 feet in elevation.

This vegetation was inundated in 1995, 1996, 1997, and 1998. Although habitat in this area is potentially suitable for breeding, it may not provide reliable nesting habitat for willow flycatchers given the current and proposed management of the reservoir; the habitat may still provide valuable foraging habitat given its proximity to standing water and abundant perching branches. The Service believes that if water elevations are reduced (as would occur under some water year types) and vegetation is allowed to grow, the habitat will again provide suitable conditions for foraging and nesting.

The delta of the North Fork of the Kern River also supports riparian vegetation, however, this riparian vegetation is found predominantly in narrow bands along the river that are unlikely to form the multi-layered dense cover preferred by willow flycatchers. According to the biological assessment (Jones and Stokes 1996), several areas in the North Fork delta currently support some small patches of wider dense riparian habitats. During limited surveys in 1992, a singing male was seen in this area (Whitfield pers. comm, 1995) and no southwest willow flycatchers were seen in 1997 and 1998 (Jones and Stokes 1998c).

Suitable habitat currently occupied by willow flycatchers is probably limited to the Kern River Preserve and the SFWA due to existing conditions and current land uses. Limited surveys upstream of the SFWA and Kern River Preserve, on the South Fork of the Kern River, revealed that habitat is potentially suitable for willow flycatcher use, as a few males were observed (Whitfield, pers. comm., 1995). Most of this land, however, is under private ownership and is

not currently being managed to establish and maintain suitable vegetative conditions in a manner that would support willow flycatcher breeding activities. Habitat upstream of the Kern River Preserve is, for the most part, grazed throughout the breeding season, but could be restored. The CDFG now owns the 1,300-acre Canebreak Creek Ecological Reserve (of which 460 acres are riparian habitat) upstream of Isabella Reservoir. However this preserve is not yet managed for willow flycatchers and grazing occurs during the breeding season. Similarly, a 92.8 acre parcel (Hafenfeld property) has been protected with a conservation easement. Of this, 23 acres consist of riparian forest buffer that will be preserved and enhanced with winter grazing only.

### Least Bell's vireo

The decline of this California landbird species (Salata 1986, United States Fish and Wildlife Service 1986) has been attributed, in part, to the combined, perhaps synergistic effects of the widespread and relentless destruction of riparian habitats and brood-parasitism by the brown-headed cowbird (Garrett and Dunn 1981). Because of this documented, drastic decline, the vireo has been listed as an endangered species by both the CDFG and the Service. The vireo was listed as endangered by State of California in 1980 and by the Service on May 2, 1986, (50 FR 16474). Critical habitat for this species was designated by the Service in February of 1994, (50 FR 4845).

The vireo is a small, olive-gray migratory songbird that nests and forages almost exclusively in riparian woodland habitats (Garrett and Dunn 1981, Gray and Greaves 1984, Miner 1989). Bell's vireos, as a group, are highly territorial (Barlow 1962, Fitch 1958, Salata 1983) and are almost exclusively insectivorous (see, for instance, Chapin 1925 and Miner 1989).

Vireos are obligate riparian breeders, typically inhabiting structurally diverse woodlands along watercourses. They occur in a number of riparian habitat types, including cottonwood-willow forests, oak woodlands, shrubby thickets, and mulefat scrub. Several investigators have attempted to identify the habitat requirements of vireo by comparing characteristics of occupied and unoccupied sites, and have converged on two features which appear to be essential: (1) the presence of dense cover within 3 to 6.5 feet of the ground, where nests are typically placed, and (2) a dense, stratified canopy for foraging (Goldwasser 1981, Gray and Greaves 1984, Salata 1981, 1983). Although vireo typically nest in willow-dominated areas, plant species composition does not appear to be as important a determinant of nesting site selection as habitat structure.

The selection of breeding sites by vireo does not appear to be limited to riparian stands of a specific age, although vireo are characterized as preferring early successional habitat. Again, vegetation structure, more than simply age, appears to be the important determinant of site use. Early successional riparian habitat typically supports the dense shrub cover required for nesting, and also a structurally diverse canopy for foraging. If permitted to persist, willows and other species form dense thickets that, in approximately 5 to 10 years, become suitable vireo habitat (Goldwasser 1981). In mature riparian habitat, the understory vegetation often consists of species such as California wild rose (*Rosa californica*), poison oak (*Toxicodendron diversiloba*),

California blackberry (*Rubus ursinus*), grape (*Vitis californica*), and a variety of perennials that provide concealment for vireo nests. In addition, vireo nest placement tends to occur in openings and along the riparian edge, where exposure to sunlight allows the development of shrubs.

Although vireos are tied to riparian habitat for nesting, they have been observed extending their activities into adjacent upland habitats. The arid nature of the southern California landscape typically results in the close proximity of riparian and non-riparian habitats such as coastal sage scrub, and vireo along the edges of riparian corridors are able to maintain territories that incorporate both habitat types. Kus and Miner (1989) found that vireo along the Sweetwater River in San Diego County traveled 6 to 200 feet from the riparian edge to reach upland areas. Upland habitat was used primarily by foraging adults and adults foraging with fledglings; however, 35 percent of the pairs whose territories included non-riparian habitat placed at least one nest there.

The vireo is a sub-tropical migrant, traveling some 2,000 miles annually between breeding and wintering grounds. Little is known about the vireo's wintering habitat requirements. It is known that vireo are not exclusively dependent on riparian habitat on the wintering grounds (Kus, unpubl. data): although wintering vireos do occur in willow-dominated riparian woodlands, a greater proportion of the population appears to occur in mesquite scrub vegetation within arroyos. Vireos during winter also occur in shrubby areas associated with palm groves, and along hedgerows associated with agricultural fields and rural residential areas.

Vireos arrive on the southern California breeding grounds in mid-March to early April, with males arriving in advance of females by several days. Observations of banded birds suggest that returning adult breeders may arrive earlier than first year birds by a few weeks (Kus unpubl. data). Vireos are generally present on the breeding grounds until late September, although they may begin departing by late July. Stragglers have been noted in October and November (McCaskie and Pugh 1965; McCaskie 1969) and occasionally individuals overwinter in California (S. Laymon, pers. comm.).

Males establish and defend territories through counter-singing, chase and sometimes physical confrontation with neighboring males. Territory size ranges from 0.5 to 7.5 acres. Nest building commences a few days after pair formation. It is believed that the female selects the nest site (Pitelka and Koestner 1942, Barlow 1962), and observations of the consistency of nest locations of color-banded females lend support to this supposition. Both members of the pair construct the nest, a process that usually takes 4 to 5 days. The nest is cup-shaped and constructed of leaves, bark, willow catkins, spider webs, and other material (Bent 1950). It is typically constructed in the fork of a tree or shrub branch, within 3 feet of the ground. Nests are placed in a wide variety of plant species including willows (*Salix* sp.), mulefat (*Baccharis glutinosa*), California wild rose, poison oak, grape, elderberry (*Sambucus mexicana*), Fremont's cottonwood (*Populus fremontii*), California sycamore (*Platanus racemosa*), coast live oak (*Quercus agrifolia*) and several herbaceous species. The majority of nests by far are placed in willows and mulefat.

Egg-laying begins 1 to 2 days after nest completion. Typically three to four eggs are laid, occasionally two, and rarely five. Average clutch size of non-parasitized nests observed with complete clutches has ranged from 3.1 to 3.9 during recent years. Adults continue to care for the young for at least 2 weeks after fledging, during which time territorial boundaries may be relaxed as family groups range over larger areas. Fledglings generally remain in the territory or its vicinity for most of the season, although the behavior of older fledglings produced early in the year has not been well studied.

Predation is responsible for the majority of nest failures, with most predation occurring during the egg stage. Predators are believed to include scrub jays (*Aphelocoma coerulescens*), Cooper's hawks (*Accipiter cooperii*), gopher snakes (*Pituophis melanoleucus*) and other snake species, raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), coyote (*Canis latrans*), long-tailed weasels (*Mustella sp.*), dusky-footed woodrats (*Neotoma fuscipes*), deer mice (*Peromyscus maniculatus*), rats (*Rattus spp.*), and domestic cats (*Felis domestics*) (L. Hays, pers. comm. 1996). Other sources of nest failure are human disturbance (trampling of nest or nest site; clearing of vegetation), and abandonment following cowbird parasitism, ant infestations, rainstorms, and unknown factors.

Vireo pairs may attempt as many as five nests in a breeding season, although most attempt only one or two. The likelihood of re-nesting depends on the time of season, the pair's previous reproductive effort, the success of previous efforts, and other factors. Few nests are initiated after mid-July. Only rarely do any pairs fledge more than two broods in a year, and most fledge just one.

Bell's vireos are insectivores, preying on a wide variety of insect types including bugs, beetles, grasshoppers, moths, and particularly caterpillars (Chapin 1925; Bent 1950). Foraging occurs at all levels of the canopy, but appears to be concentrated in the lower to mid-strata, particularly when pairs have active nests (Grinnell and Miller 1944; Goldwasser 1981; Gray and Greaves 1984; Salata (1983), Miner (1989). Salata (1983) found that 69 percent of 131 foraging observations were within 12 feet of the ground. Miner (1989) found a similar peak in foraging activity in vegetation between 9 to 18 feet in height. Foraging occurs most frequently in willows (Salata 1983; Miner 1989) and Miner (1989) observed that black willow (*Salix gooddingii*) was used preferentially relative to its cover within vireo territories. Arroyo willow (*S. lasiolepis*) was used preferentially in the 0 to 12 feet height range, possibly reflecting a tendency to forage close to nest sites. Insect sampling revealed that potential vireo prey abundances were highest on black willow, arroyo willow, and mulefat.

Preliminary results of studies of color-banded birds indicate that vireo have a lifespan ranging to seven years (L. Hays, pers. comm.). A large proportion of the population dies before reaching the age of one, as is typical of small migratory passerines. Banded bird returns suggest that between 5 and 29 percent of vireo survive to their first breeding season, a wide range brought about by probable year-to-year differences in survivorship as well as differences in the effort devoted to reconnaissance for banded birds between sites, years, and observers. It is probable

that, like other migratory passerines of similar size, roughly 25 percent of juveniles survive to their first breeding season. Re-sightings of adults suggest that once birds reach the age of one, they exhibit an average annual survivorship of approximately 47 percent (Salata 1983; Kus, unpublished data). Female survivorship appears on average to be lower than that documented for males (44 versus 49 percent, respectively; Kus unpubl. data), presumably because of the toll that egg production takes on longevity.

While most first-time breeders return to their natal sites to nest, on average approximately 20 percent disperse to other drainages. This figure may be even higher, and will require more extensive rangewide surveys to determine. Birds show evidence of an ability to disperse long distances between drainages, moving as far as 130 miles from the natal site (Greaves, pers. comm. regarding a disperser from the San Luis Rey River to the Santa Clara River in 1994). On average, a greater proportion of males (22 percent) than females (13 percent) disperse from their natal sites (Kus unpubl. data).

The earliest studies of color-banded vireo suggested that they were strongly site tenacious; once birds selected a breeding site, they returned to it year after year (Greaves, pers comm. 1989; Salata 1983). Not only do vireo return to the same drainage, they return to the same territory, and even the same nest tree or shrub, a remarkable feat considering the terrain covered during the course of migration. However, many banded birds are seen for the first time as two-year-olds and sometimes older, indicating that they have changed breeding locations during their first few years.

Riparian habitat loss in the Central Valley, estimated at 95 percent of that present during the Gold Rush (Smith 1977), has resulted in near extirpation of the vireo from an area that at one time supported 60 to 80 percent of the Statewide population. Riparian woodlands have been cleared primarily for agricultural purposes, rivers have been diked to prevent winter flooding of bottomlands, and dams built to impound water for agricultural, industrial, and domestic use. As a result, large amounts of vireo breeding habitat have been inundated or removed. Flood control projects and channelization of rivers have further reduced available vireo habitat. Livestock grazing has destroyed the choice lower strata of vegetation preferred by the vireo (Overmire 1962). Similar activities are responsible for the decline of riparian habitat in Baja California (Short and Crossin 1967). Grinnell and Miller (1944) considered the vireo still "common, even locally abundant under favorable conditions of habitat". However, they noted that in the "last fifteen years a noticeable decline has occurred in parts of southern California and in the Sacramento-San Joaquin Valley".

Historically, the vireo was widespread and abundant, ranging from interior northern California near Red Bluff (Tehama County), south through the Sacramento-San Joaquin Valleys and Sierra Nevada foothills, and in the Coast Ranges from Santa Clara County south to approximately San Fernando, Baja California, Mexico (Grinnell and Miller 1944). Populations also were found in the Owens Valley, Death Valley, and scattered oases and canyons throughout the Mojave Desert.

The vireo currently occupies a very small fraction of its former range (Goldwasser *et al.* 1980) and is, at best, a rare and local species.

In 1973, no vireos were found during an intensive search in formerly occupied habitat between Red Bluff, Tehama County, and Stockton, San Joaquin County (Gaines 1974). By the early 1980s, the vireo had been extirpated from the Sacramento and San Joaquin Valleys, once the center of its breeding range, and the species was restricted to two localities in the Salinas River Valley (Monterey and San Benito counties; D. Roberson, pers. comm.), one locality along the Amargosa River (Inyo County), and numerous small populations in southern California south of the Tehachapi Mountains and in northwestern Baja California, Mexico (Gaines 1977, Goldwasser 1978, Goldwasser *et al.* 1980). By the time the vireo was listed in 1986, the statewide population was estimated at 300 pairs, the majority of which were concentrated in San Diego County.

The remaining birds are concentrated in San Diego, Santa Barbara and Riverside counties. The entire known United States population in 1994 consisted of approximately 700 breeding pairs (USFWS 1995a); 1996 survey results showed an increase to approximately 1,300 pairs (data presented at Interagency and Public Workshop on vireo, March 7, 1997). Habitat loss and fragmentation continues to threaten the remaining vireo populations in southern California and Baja California. These conditions make vireo populations particularly vulnerable to local and possibly rangewide extinction (Wilcox 1980). Small populations are susceptible to catastrophic extinction, where the entire population could be adversely impacted as a result of stochastic events such as fire, flooding, as well as demographic failure, where the population fails to produce any or enough offspring to survive into the future. Large inter-population distances reduce the ability to disperse which is necessary for genetic exchange among populations, heightening the risk of deleterious inbreeding (Soule 1980; Conway 1980; Senner 1980). Lack of available habitat to serve as "refuges" during years when floods and other processes eliminate breeding sites poses a serious threat to the continued survival of the species.

Cowbirds are native to the eastern U.S., and with the exception of a few winter or vagrant records, were absent from most vireo's habitat prior to 1900. The first reported cowbird eggs in vireo nests were discovered in 1907 (Linton 1908). Soon it was difficult to find nests of this species that had not been parasitized (Dawson 1923, Hanna 1928, Rowley 1930). The immediate impact of cowbird parasitism was probably great because the vireo population had not previously been exposed to it and therefore had not evolved defenses against it, as have other species with a long evolutionary history of co-occurrence with nest parasites. Cowbirds have not only expanded generally into the western U.S., they achieve particularly high concentrations near vireo breeding sites as a result of land use practices. Dairies, livestock grazing, equestrian centers, and golf courses, all of which tend to be sited in rural areas along rivers, provide foraging areas for cowbirds in the vicinity of vireo breeding habitat.

The vireo is a common host (Hanna 1928; Dawson 1923, Rowley 1930, Grinnell and Miller 1944, Goldwasser *et al.* 1980, Salata 1981) and readily accepts cowbird eggs, although it is a relatively poor host and does not fledge many cowbirds (Friedmann 1963). The tendency of male

vireo to sing from the nest no doubt enhances vulnerability to parasitism, although cowbirds evidently locate most nests by observing the pair during nest construction. In heavily parasitized areas, up to four cowbird eggs may be found in vireo nests (Salata 1983). Cowbird parasitism reduces vireo productivity in much of the same ways that are described in the status section of the willow flycatcher.

Breeding populations in northern Baja California apparently underwent similar declines during the same period. During a brief survey in 1980 of Baja California, Mexico, Wilbur (1981) found 40 pairs distributed in six locations. Although he believed that more birds were present than his incomplete survey found, Wilbur observed that habitat was limited and susceptible to many of the same development pressures present in the U.S. Subsequent visits to northern Baja, California since the late 1980s have revealed that a vireo population of 20 to 30 pairs continues to exist at Rancho San Jose (Kus, unpubl. data), and a large (as high as 75 pairs) concentration occurs along the Santo Tomas River (J. and J. Griffith, Kus unpubl. data). Other sites supporting vireo include Catavina, San Telmo Valley, and La Mision. Recent observations suggest that unlike Wilbur's (1980) earlier assessment, cowbird parasitism is currently a serious threat to vireo breeding in Baja, California.

Since the vireo was listed in 1986 and intensive cowbird removal programs initiated, the species has undergone an increase almost as dramatic as its decline. While a few populations surviving the decline have generally stabilized in size (e.g., the Sweetwater, San Diego, and Santa Ynez populations), most have undergone tremendous growth. For example, vireos at the Santa Margarita River at Marine Corps Base Camp Pendleton (MCBCP) have increased in number from 15 males in 1980 (Salata 1980) to 348 in 1994 (USFWS 1995b); similar increases have occurred at the Prado Basin on the Santa Ana River, where the vireo population grew from 12 males in 1985 (USFWS 1986) to 188 in 1994 (Pike and Hays 1993), and at the Tijuana River, where the population expanded from 13 males in 1990 (Kus 1990) to 80 males 4 years later (Kus 1994). Although a thorough rangewide survey has not been conducted since the 1986-87 effort, available census data indicate that the vireo population in southern California has tripled over the last eight years.

Vireos appear to be expanding their range and recolonizing sites unoccupied for years or decades. Expansion is occurring both eastward in San Diego County as birds become re-established in the more inland reaches of the coastal valleys, and northward as birds disperse into Riverside and Ventura Counties. Observations of color-banded birds at these sites reveal that dispersal from the more southerly breeding populations is partially responsible for the colonization. As populations continue to grow and vireos disperse northward, it is anticipated they could reestablish in the central and northern portions of their historic breeding range.

Vireos are currently restricted in their breeding distribution to eight counties in southern California and portions of northern Baja, California, Mexico. The eight "core" populations are located in Tijuana River, Sweetwater River, San Luis Rey River, West San Luis Rey River, Santa

Margarita River, Santa Ana River, and Santa Ynez River. Available census data indicate that vireo populations in southern California have tripled over the last 8 years.

Within the Lake Isabella vicinity, recent sightings on the South Fork of the Kern River suggest that the vireo may be returning to this area. In May of 1992, a single unmated male was sighted in this area for 6 weeks during the breeding season. In 1994, a male vireo was sighted in August, and another vireo was seen in December of 1995 (S. Laymon, pers. comm.). During the 1996, 1997, and 1998 breeding season, vireos were recorded using the South Fork of the Kern River, however, no breeding has been detected.

### Effects of the Action

#### Southwestern willow flycatcher

The proposed long term reservoir operations is assumed by the Service to have both long and short-term effects to willow flycatchers and their habitat. According to the definitions outlined in the proposed rule for listing the willow flycatcher (58 CFR 39495), critical habitat is defined as areas that were historically occupied, are currently occupied, are suitable but not occupied, and have potential for future use; all categories are considered important to the continued existence and recovery of the species. In this biological opinion all habitat within the project area is considered to be occupied by willow flycatchers. For this consultation our estimates are based on current aerial photo interpretation and site visits. All of this area is expected to be inundated numerous times during the life of the project.

Effects, both direct and indirect, that can reasonably be attributed to reservoir operations are discussed. We have used the best available scientific and commercial information to judge potential effects. We also understand that many of these same effects (predation, competition, parasitism, *etc.*) may occur at higher, lower, or similar levels without considering the impacts of reservoir operations (so called "baseline conditions"). However, as with all biological systems, some level of scientific uncertainty exists over the causal factors for effects, but it is the responsibility of the Federal action agency to show the absence of these likely, adverse effects to listed species and critical habitat as a result of its proposed action (52 FR 19949). Thus, given the multiple variables that can effect willow flycatcher breeding, feeding, and sheltering, and that the Act directs the Service to provide the "benefit of the doubt" to the species when formulating our biological opinion and assessing potential impacts (52 FR 19952), we believe we have been rigorous and reasonable in identifying the potential effects of reservoir operations on the willow flycatcher.

#### *Direct effects on nesting birds*

Rising water levels in Isabella Reservoir may directly inundate flycatcher nests in the SFWA. The Corps' projections of peak inflows and peak reservoir levels coincide with the willow flycatcher breeding season from April through July. Flycatchers nesting low in trees and shrubs would be highly vulnerable to increases in water elevation. Of 152 nests monitored on the South

Fork Kern River between 1989 and 1996, the average nest height was 2.18 m with a range of 0.6 to 10.0 m (Whitfield and Enos 1996). Jones and Stokes Associates, Inc. (1997) found that in 1996, water completely inundated trees rooted at 2,580 feet elevation with heights 3 m to 6 m and trees of 7.6 m almost completely. When the reservoir is at higher levels or full pool (between 2,590 to 2,600 feet) we assume the impacts of nest inundation could occur for nests located in the lower portions of vegetation located between 2,584 and 2,595 feet.

During the 1995 breeding season, Whitfield and Strong (1995) monitored the success of six pairs of actively-nesting flycatchers in the SFWA. Rising water levels inundated four nests, and would have flooded an additional three nests except these nests were relocated by the researchers. Relocation of nests is not a reliable technique for ensuring successful breeding attempts. Of the three nests relocated to avoid flooding in 1995, only one eventually fledged young; the other two were lost to predation (Whitfield and Strong 1995). Relocated nests may be especially vulnerable to predation and physically moving nests may harm eggs or nestlings, or interfere with the incubation of eggs or the parental care of young. Limited data suggest that no more than 33 percent of the relocated nests will succeed. This analysis is based on the small sample of three relocated nests in 1995. Further, it cannot be assumed that all nests can be relocated; in any given breeding season several nests may go undetected.

#### *Reduced productivity and survival*

Comparison of SFWA nest monitoring results from 1992 and 1994 (years when the SFWA was not inundated) (Whitfield 1993, 1994) with 1995 (when monitored nests in the SFWA were inundated) (Whitfield and Strong 1995) indicates that the reduced productivity associated with inundation results in a decrease in: (1) the hatch rate (the number of eggs that hatch); (2) the number of young fledged per actively-nesting pair; (3) the percentage of successful pairs; and (4) the number of successful nests (see Table 6). In other words, nesting pairs of willow flycatchers can not fully compensate for the loss of a nest to inundation (or to the increased predation or parasitism due to inundation of habitat) by renesting.

During the years of Whitfield's study (1989 to 1999) 1995 was the only year when the reservoir level rose after nest initiation, egg laying, and hatching by willow flycatchers. The Corps proposes to manage the reservoir according to historic operations, thus, we assume nests would be inundated in some years based on water year type and timing.

A comparison of 1992 and 1994 with 1996 is awkward since the SFWA was inundated in 1996 prior to territory initiation, and thus precluded nesting attempts in the SFWA, except for two pairs that nested in the inundated area. One of these two pairs was successful in fledging young. The best indication of the effects of the SFWA being inundated in 1996, is that the number of nests initiated was substantially lower as was the number of eggs laid, as shown in Table 6. This may represent lost reproductive potential due to unavailable breeding space. Although surveys are incomplete upstream of the Kern River Preserve and SFWA, no data suggest that the birds relocated elsewhere, as the total number of nesting birds was lower in 1996 than 1995.

The data presented in Table 6, suggest that continued and consecutive inundation and related impacts may depress the number of young fledged per actively-nesting pair by decreasing the percentage of nesting pairs that are successful in fledging any young at all. This has a more deleterious impact to the local population than reaching the same ratio of fledglings per pair by reducing the success of each pair. Eliminating or reducing nesting attempts or the nesting success of any pairs reduces the effective population size of willow flycatchers in the project area, which could decrease the total genetic variance of the population (through an increase in genetic drift) and increase its vulnerability to demographic stochasticity and possibly inbreeding depression. Given the site fidelity of adult willow flycatchers, birds that were unsuccessful in nesting in inundated habitat may return to the same area, with the same result, in future years.

Overall Whitfield's study has shown an increase in nest success (26 percent average during the first 5 years to 43 percent average for the last 6 years) (Whitfield *et al.* 1999). The increase is likely due to cowbird control. However, the overall number of nesting pairs in the study area has showed a steady decline (35 percent average during the first 5 years to 30 percent during the last six years) (Whitfield *et al.* 1999).

Although the data from 1995 provide the best available example of the effects of inundation of the SFWA on willow flycatcher nesting and reproductive success, differences between 1995 and future years may limit the applicability of the 1995 model to future years. The willow flycatcher population in future years within the scope of the project life, may show fluctuations in the number of territories established and reproductive success. Of particular interest is that 1996 was the second consecutive year of extensive flooding of the Wildlife Area and 1997 the third consecutive year; this may result in changes in habitat quality that have effects on willow flycatchers above and beyond those effects documented in 1995.

In addition to direct take of nests and diminished productivity and survival of willow flycatchers, three other important mechanisms by which inundation of habitat during the breeding season may adversely affect willow flycatchers: (1) increasing predation, parasitism, and competition; (2) by precluding use of available breeding space; and (3) through any changes in habitat quality due to prolonged and consecutive years of inundation.

#### *Predation/Competition*

Rising water levels and inundation of habitat can have short-term effects on willow flycatchers in ways other than flooding nests. Inundation of habitat may increase intra- and inter-specific competition in limited breeding and foraging habitat, and it may increase pressure from both predators and parasites. Habitat at this time does not appear to be a limiting factor for willow flycatcher breeding, however, future recovery potential would be effected by continued and consecutive inundations.

These effects may extend beyond the area directly affected by inundation, and may continue beyond the year of inundation. For example, inundation may cause predators to move their dens

or nest sites to dry habitat; the next year, willow flycatchers attempting to nest in these areas may face a much-increased density of predators as the young born during the inundation year mature. Predation and parasitism may also increase as vegetative cover is reduced; in 1995, when Isabella Reservoir flooded the SFWA, researchers noted a larger number of predators in trees and flooded areas (Whitfield pers. comm., 1996), and Whitfield and Strong (1995) documented a 64 percent increase in the rate of nest predation in the SFWA during 1995 compared to 1994, when it was not flooded. Predation was the largest cause for nest failure during Whitfield's 9 years of study (Whitfield *et al.* 1999), and during the non-inundation years of 1998 and 1999, predation rates remained high. However, we believe inundation regimes may result in changed patterns and mechanisms of predation resulting in impacts to willow flycatchers.

#### *Delayed breeding*

The direct effects of inundation as well as the indirect effects (*i.e.*, predation, parasitism) may cause birds to abandon their territories and attempt to reneest. Whitfield and Strong (1995) found that flycatchers that fledged earlier in the season had higher survivorship, and were more likely to return to the project area to breed in subsequent years, than young that fledged later in the season. They concluded that cowbird parasitism, which was associated with breeding later in the season, had more subtle effects on the reproductive success of flycatchers than just lowered nest success and reduced numbers of young produced.

Nest inundation is another mechanism that leads to fledging later in the season. Whitfield and Strong (1995) found that, of the six actively-nesting pairs in the SFWA in 1995, only three were eventually successful in fledging young; only one pair was successful in fledging young from its first monitored nesting attempt. In the (non-inundated) Kern River Preserve, 10 of 15 monitored actively-nesting pairs succeeded in fledging young, including 7 pairs in their first nesting attempt. This suggests that, even though some willow flycatcher pairs that suffer nest inundation, or nest failure after relocation, may reneest and eventually fledge young, these young are less likely to survive and return to breed than the young from non-inundated nests that fledge earlier in the season. This effect is apparently strong: Whitfield and Strong (1995) found that only 6.4 percent of banded, late-fledging nestlings were recaptured on the study site as adults, compared to 21.9 percent of the banded, early-fledging nestlings.

#### *Loss of available breeding space*

When inundation of the habitat occurs prior to the spring return of willow flycatchers, breeding is essentially precluded in the inundated habitat, depending on the type of water scenario in terms of duration and depth. This is anticipated in many years over the life of the project and in particular during years when a carryover of water into the Flood Control Space occurs. In these years with carryover, water levels will be higher prior to snow-melt and spring runoff. This will increase the chances that water levels remain at a level high enough to inundate habitat prior to the breeding season and throughout the breeding season. Inundation of habitat prior to the

breeding season occurred in 1996, as described above, when only two pairs established nests in the SFWA and only one pair reproduced successfully.

Willow flycatchers have used the SFWA for nesting while other, seemingly suitable areas outside of the SFWA were unused. Thus, while we believe habitat in the valley is not limiting for the total current population of willow flycatchers we also believe impacts to the population have and will occur because of the loss of this breeding space. The loss of space due to inundation may affect the entire population by limiting suitable habitat and effectively lowering the carrying capacity. Long-term population viability and recovery could be affected if a significant portion of the South Fork Kern River habitat (*i.e.*, the Wildlife Area), is not available for breeding activities and an insufficient amount or quality of alternative breeding space is provided.

The previously described impacts to the population dynamics and maintenance of genetic diversity in the local population may be exacerbated, if the set of willow flycatchers adversely affected by inundation is not random. Whitfield (pers. comm., 1996) has indicated that her data suggest that birds that fledge from the Kern River Preserve tend to return to nest in the SFWA. If the Kern River Preserve provides the only suitable breeding habitat in the project area (because the SFWA is inundated, and lands upstream of the Kern River Preserve are managed in ways that leave them unsuitable for nesting), genetic exchange within the local population may be compromised. The non-random pattern of birds affected by inundation would also decrease the effective population size of willow flycatchers along the South Fork of the Kern River. This would further increase the risk of the local population to demographic and environmental stochasticity and inbreeding depression.

Based on field observations by Whitfield and annual reports (pers. comm. 1996, Whitfield 1994, Whitfield and Strong 1995, Whitfield and Enos 1996), available suitable breeding habitat may have already been diminished; the abandonment of nesting areas close to Patterson Lane seems to have occurred within the past 3 years. Whether willow flycatchers will recolonize this area in the future is unknown at this time. This may be because inundation in consecutive years left these areas unsuitable. The project description, based on the historical record, is not expected to inundate the entire Wildlife Area every year. However, even in years without inundation of the habitat during the breeding season, effects are seen in vegetative structure in the year after inundation. Consecutive years of inundation may prolong the impacts resulting in abandonment of all or portions of the SFWA and thus leaving an even smaller area suitable for breeding, foraging, and dispersal.

Coupled with the effects of diminished breeding space is the concern that willow flycatchers will be displaced into habitat that is less suitable. Habitat upstream of the SFWA/Kern River Preserve, is for the most part, currently under private ownership and is grazed throughout the breeding season and often cleared for river access and flood control. Birds that attempt to nest in these areas may experience nest trampling by cattle and noise disturbance from construction activities. This portion of the South Fork Kern River is also a much narrower riparian corridor. Based on aerial photographs, the average width of the riparian corridor within the SFWA is

approximately 6,000 feet and is approximately 1,800 feet wide in the Kern River Preserve. Upstream however, the riparian corridor is an average of 700 feet wide. The suitability of narrower riparian corridors is questionable when compared to wider riparian patches such as the Wildlife Area. Keller *et al.* (1993) found a positive relationship between riparian corridor width and presence of neotropical migrant birds. This is probably due to the fact that edge effects are typically more pronounced in narrow corridors. Thus, predation and parasitism rates may be higher in the area upstream of the Kern River Preserve, since there is a higher edge to interior ratio and nesting birds. However, this "edge" effect will be minimized on 1,100 acres of habitat upstream of the reservoir with a variety of management strategies including trapping cowbirds and removing cowbird eggs during nest searches, removing/managing livestock, restoration of previously cleared riparian habitat, and restoration of hydrological features.

#### *Habitat degradation/mortality*

An analysis of historical operations from 1954 to 1998 includes 19 cases in which willow flycatcher habitat was inundated to some degree during the growing season. During this period, varying acreages of habitat have been subject to consecutive years of inundation and prolonged periods of inundation. Tables 7 and 8 indicate the amounts and extent of inundation from 1993 to 1998. Historical operations are analyzed to gauge the potential future effects to existing willow flycatcher habitat above 2,584 ft. Jones and Stokes (1999) report after review of historical photographs, that riparian vegetation below 2,590 ft. became established in the years between 1980 and 1985 when consecutive years of inundation occurred and livestock was removed. Now well established, this vegetation will be subjected to prolonged and consecutive years of inundation which will result in chronic and direct mortality.

Looking at the past six growing seasons (1993 to 1998), habitat west of Patterson Lane (<2,584 ft.) was inundated for six consecutive years. Assuming a March through September growing season of 214 days (K. Fuller, pers. comm.), the SFWA (>2,584 ft.) was inundated 5 out of 6 years and for 4 consecutive years for more that 63 percent of the growing season. Higher elevations (>2,591 ft.) were inundated for 4 consecutive years (1995 to 1998) and duration of inundation during the growing season was significant (39 to 56 percent).

The effects of inundation vary widely based on timing, duration, species, soil types, and degree (total versus partial immersion). Based on Gill's analysis (1970), even the most flood tolerant species need to be unflooded for at least 55-60 percent of the growing season. Thus, the habitat west of Patterson Lane, with 4 or 5 consecutive years of inundation during the majority of the growing season, is likely to die or be severely degraded. In fact, Jones and Stokes Associates, Inc. (1997) found that 60 percent of all willows below the 2,580-foot elevation were dead and this mortality was attributed to inundation pre-1996, indicating that the inundation durations seen in the years prior to 1996 were sufficient to kill the willows. As a result of the 1996 season (and cumulative effects of consecutive previous years of inundation), data collected from a transect along the 2,580-foot elevation, indicated that 47 willows died and 63 live willow trees fell. Along this same elevation, broken branches were observed on 17 trees, as well as leaf loss on all

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canopy edge trees. Because these numbers represent observations at sample points per studied elevation, when extrapolated to represent the entire area, an approximation of the total amount of mortality and degradation can be estimated.

Habitat east of Patterson Lane (above 2,584-foot elevation) was inundated in 1993, 1995, 1996, 1997, and 1998. Water elevation levels exceeded 2,584 feet for 135 days (63 percent of growing season) in 1995, 163 days (76 percent of growing season) in 1996, 226 days (95 percent of growing season) in 1997, and 186 days (83 percent of growing season) in 1998. Based on sample points at the 2,590-foot elevation, Jones and Stokes Associates, Inc. (1997), found that one red willow died, 16 live willows fell, and 5 willows were observed to have broken branches. Again, when these data are extrapolated to represent the entire area between the 2,584- and 2,591-foot elevation, the extent of mortality and/or degradation of vegetation can be estimated; this provides an estimation of impacts expected, over the life of the project, when inundation durations and depths are similar or worse than observed in the last few years, as analyzed by Jones and Stokes Associates, Inc. (1997). Further, with inundation frequencies similar to those projected with routine operations, the level of mortality and degradation may resemble that observed west of Patterson Lane, where inundation frequencies and durations have been higher in recent years. Jones and Stokes (1998, 1999, 2000) found that mature black willows can tolerate long periods (4 growing seasons) of inundation over the base of the tree and seedlings can tolerate inundation over the top of the plant for 4 months without experiencing direct mortality.

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Habitat above the 2,591-foot elevation line was affected in 1993, 1995, 1996, 1997, and 1998. In 1995, water exceeded this level for 89 days (41 percent of the growing season), in 1996, 111 days (52 percent of growing season), 1997, 112 days (39 percent of the growing season), and in 1998 for 126 days (56 percent of the growing season). Although this habitat was affected for a smaller percentage of the growing season and mortality of trees/shrubs is less likely, sublethal effects on vegetation are expected. Sample points at the 2,600-foot elevation, indicated that two live willows toppled and three willows were observed with broken branches (Jones and Stokes Associates, Inc. 1997). Of most importance, is that this large amount of habitat was, for the most part, not available to breeding birds for a substantial portion of the breeding season and for consecutive years.

Nearly full pool was reached for 38 days in 1995 (18 percent of the growing season), 55 days (26 percent of growing season) in 1996, and for 56 days (26 percent of the growing season) in 1998. Jones and Stokes Associates, Inc. (1997) observed no habitat loss or degradation at the 2,605-foot sample point. While 60 percent of willows west of the 2,580-foot elevation were dead after approximately 3 or 4 years of inundation (1992-1995), a similar effect could occur at the 2,600-foot elevation (or greater) if this level is inundated in consecutive years, though total mortality would be influenced by other factors such as topography, tree height, and other factors. This habitat represents a large portion of breeding habitat that is seasonally unavailable to most breeding birds. Full pool is typically reached in late June through mid-July. By this time, nests are established and eggs and/or young are under parental care and extremely vulnerable to

disturbances. Consecutive years of full pool water levels may cause consecutive years of nest failure, mortality of young and may affect a bird's entire reproductive lifespan.

Flooding during the growing season affects trees at all stages of development. Responses include inhibition of seed germination, shoot and root growth, arrested reproductive growth, morphological changes, and often death of trees (Gill 1970). Published data on the tolerance of riparian vegetation to inundation indicate that two or more growing seasons with inundation can cause mortality. For example, Green (1947) tracked vegetation within Clinton Pool on the Mississippi River in the early 1940s. After 3 years of flooding in which the root crowns were covered by water, sand-bar willow (*Salix hindsiana*) and cottonwood were all dead and black willow (*Salix nigra*) and buttonbush survived. A few black willows survived 3 years of inundation but all trees died in the fourth year. Mortality of Gooding's willow trees at Lake Mead, Arizona resulted from prolonged inundation (R. Marshall, pers. comm.). Further, Hunter *et al.* (1987) documented the loss of a 120-ha (296-ac) stand of cottonwood-willow near the confluence of the Bill Williams River and the Colorado River in 1981 after 24 months of continual inundation of root crowns.

Related to the length of inundation is the fact that trees are injured more by standing water than by flowing water (Gill 1970). Two year old *Nyssa sylvatica* var. *biflora* and *N. aquatica* seedlings were continuously flooded to a depth of 20 cm above the soil surface with moving water and stagnant water. Height growth of both species were lowest in the stagnant water which also had the lowest oxygen and highest carbon dioxide levels (Harms 1973).

In addition to seasonal variations and lengths of inundation, water depth is another factor in flood Damage. Knighton (1981) demonstrated experimentally that three willow species (*Salix gracilis*, *S. discolor*, *S. bebbiana*) inundated for two consecutive growing seasons with just 6 inches (15 cm) of water suffered nearly complete mortality. Inundation depths of 6 to 10 inches (15 to 25 cm) have been shown to result in a decrease in growth of herbaceous species and seedlings (Teskey and Hinkley 1977). Jones and Stokes Associates, Inc. (1997) found that inundation, in water year 1996, at the 2,580-foot elevation, rose above the tree canopy during the breeding season. Trees reaching 3 m high were completely covered for 122 days, trees at heights of 4.5 m were completely inundated for 89 days, 6 m high trees were totally inundated for 59 days, and 80 percent of the vertical stature of trees of 7.5 m were inundated for 59 days. Complete submersion of trees could occur at higher elevations. For example, at the 2,590-foot elevation, 1.5 m trees would be completely inundated for 89 days, and for 59 days, 3 m trees could be completely submerged and 4.5 m trees almost completely inundated. Taller trees or those rooted at higher elevations would experience a shorter period of inundation and conversely, shorter trees or those rooted at lower levels would experience extended periods of inundation.

If Gooding's willow trees within the project area prove to be more tolerant to flooded conditions that published literature suggests, or if reservoir operations provide temporary relief from prolonged inundation, sub-lethal effects on the vegetative composition and structure may also decrease the ability of the vegetation to serve as a nest substrate, perch site, or source of cover.

According to Ploskey (1985), inundated herbaceous plants usually succumb more rapidly than woody plants; most expire in less than one month; few last several months; and none have been reported to survive over a year of inundation.

Prolonged or repeated inundation of willow flycatcher breeding habitat could change the vegetation structure and result in a loss of low-level branches and the herbaceous vegetation beneath them. Even if this inundation does not flood nests, it could adversely affect willow flycatchers, which use low branches for perching, foraging and cover. In addition, willow flycatchers use a variety of woody and herbaceous vegetation, such as willows and nettles, for nest substrate/material; Whitfield (pers. comm., 1996) found that once inundated, nettles no longer provide suitable nest substrate. During a field visit in March 1996, nettles that had been inundated in 1995 were pointed out by a researcher as being alive yet the fibers were no longer suitable as nest material. In fact, the Corps' biological assessment states that flooded conditions in 1995 and 1996 prevented the establishment of nettles and other understory plants and may have reduced the suitability of the SFWA for breeding pairs (Jones and Stokes 1996). Jones and Stokes Associates, Inc. (1997) found that impacts to herbaceous plant species consisted of a delay in germination, establishment, growth, and development, principally in the areas below the 2,590-foot elevation, and a potential displacement of perennial populations by less diverse patches of annual species below the 2,585-foot elevation.

#### *Continued brown-headed cowbird trapping*

The cowbird control program at the Kern River Preserve has been successful; compared to the non-trapped area (the SFWA), the rate of nest parasitism is lower and the number of young fledged per pair is higher in the trapped area (Whitfield *et al.* 1999). The data suggest the mechanism by which cowbird trapping and control may benefit willow flycatchers is by increasing the number fledged by successful pairs, rather than by increasing the proportion of nesting pairs that are successful. This would not have the same benefit to the local population as a whole as would increasing the proportion of nesting pairs that are successful, for the reasons discussed above in the context of the impacts of inundation.

The cowbird trapping program expansion proposed for the SFWA and the 1,100 acres of "protected" lands is as intensive as the program implemented in the Kern River Preserve over the last 3 years. However, there is likely to be many years during the project life, in which inundation of the SFWA precludes the placement of traps. This scenario occurred during the 1996 breeding season; cowbird trapping, which was part of the Corps' 1996 project description, was not fully implemented due to inundation. In 1996, seven traps were placed on the Kern River Preserve but only one was placed within the Wildlife Area. In this case, and in future years with the same situation, beneficial impacts associated with increased cowbird trapping will be small to none and this will be coupled with a temporary loss of breeding habitat and degradation of suitable habitat.

When implemented, expansion of the ongoing cowbird control program to include the SFWA and 1,100 acres of "protected" lands is likely to further reduce parasitism in the Kern River Preserve. There are two kinds of evidence for this, both alluded to by Whitfield and Strong (1995). First, the cowbird control and trapping program in the Kern River Preserve has been able to significantly reduce, but not eliminate, parasitism in the Preserve. One reason for the continued low level of nest parasitism may be the existence of a "refuge" for cowbirds in the untrapped SFWA and lands currently in private ownership upstream from the Preserve. The other evidence lies in the decreased rate of nest parasitism in the untrapped Wildlife Area over the course of the study, apparently due to the trapping of cowbirds at the Kern River Preserve.

### *Recreation*

An inter-related and inter-dependent effect of inundation of the SFWA and other areas of suitable habitat is increased opportunities for recreational activities. When inundation of habitat occurs, boats and other motorized water crafts gain access to these areas. In 1996, the Service coordinated with the Forest Service to eliminate use of the inundated Wildlife Area to personal watercraft (*i.e.*, jet-skis) and to place a 5 mile per hour speed limit on other watercraft. However, if enforcement is not adequate, speed limits may be exceeded and jet skis may enter the Wildlife Area thereby raising noise levels. The noise disturbance associated with motorized boats can harass and cause harm to nesting willow flycatchers. Birds can be flushed from nests at critical times leaving eggs unincubated, young exposed and drawing attraction to nest sites thereby increasing the potential for predation and parasitism.

Many birds have acute senses of hearing (Dooling 1978, Knudsen 1978, Fay and Feng 1983). Researchers have documented and described the negative effects of noise on avian species and wildlife as a whole. For instance, Fletcher *et al.* (1971) have reported that few if any of the reported or suggested effects of noise on wildlife would benefit them or increase their chances for survival whereas known, detrimental noise effects may decrease their chances for survival or even lead to their death. In the extreme, the apparent effects of noise can be devastating to wildlife populations.

Woolf *et al.* (1976) have concluded that prenatal auditory stimulation can affect the development (and, therefore, the physiology) of an avian embryo inside an egg. Noise can also affect deleterious changes in the behavior of wild birds. For instance, noise-induced behavioral changes in birds can cause significant declines in reproductive output. Gunn and Livingston (1974) reported that a bird population exposed to helicopter disturbances and human activity suffered (in contrast to the control population) lower hatching and fledging success and increased rates of nest abandonment and the premature disappearance of nestlings. Vireos videotaped on the nest during the 1992 breeding season adjacent to the Corona Airport visibly reacted to the overflight of aircraft in the vicinity (USFWS 1995b).

Of the four Environmental Protection Agency categories of noise effects on wildlife (Dufour 1980), "masking" may be the most detrimental to small perching birds such as the willow flycatcher and vireo. In essence, "excess sound can interfere with the perception of important, relevant auditory signals" (Miller 1974). The lives of a willow flycatcher and vireo may well depend upon its detection of an alarm call given by another bird (or other source) that warns of the approach of a potential predator. Whether or not a bird receives this vital information depends on such noise parameters as environmental attenuation, signal to noise ratios, and discrimination of the receiver given the background noise. Obviously, when an alarm call is masked by environmental noise, an individual willow flycatcher (or a group) may be at increased risk. Scherzinger (1979) has observed that background noise may have negative consequences on predator avoidance by hazel grouse and Shen (1983) further observed that a bird's ability to detect vibration may be crucial for sensing approaching predators, particularly if the birds are sleeping.

#### Least Bell's vireo

Because the vireo appears to be dispersing to the South Fork of the Kern River and/or recolonizing this area, the project may potentially hinder the re-establishment of a viable population and may reduce survival and productivity of birds that do, in fact, attempt to breed in this area. The effects analysis described above for the willow flycatcher are expected to apply to the vireo because of the similarity in nesting and foraging habits. The vireo may utilize a broader range of habitat types and therefore, may have better success in finding alternative territory sites when the SFWA is inundated. Like the willow flycatcher, the vireo is expected to be positively impacted by continued intensive cowbird trapping and habitat protection/enhancement.

#### Southwestern Willow Flycatcher Critical Habitat

The **Effects of Proposed Action** section above, addresses the nature of the effects of inundation on willow-riparian habitat and the extent of degradation and/or habitat loss expected. In summary, extended periods of inundation will adversely affect suitable and potentially suitable habitat when the lake level is above 240,000 acre-feet storage or an elevation of 2,570 feet above sea level. This is particularly true for habitat west of Patterson Lane, in the South Fork arm of Isabella Reservoir. Water levels reaching from 240,000 acre-feet to full pool, as anticipated in many years, will inundate this habitat for prolonged periods of time and possibly year round. Based on the statistical analysis in the biological assessment, there will be a 12 to 60 percent chance that water reaches and/or exceeds Patterson Lane, affecting the SFWA. With this probability, the effects are expected to be frequent and may be compounded by consecutive years of impact. Years in which the water does not reach 240,000 acre-feet will have no effect. Water depths in this area with the proposed reservoir management will vary from approximately 2 feet to 15 feet, based on field observations, photos of the 1995 high water line, and contour maps.

During the breeding seasons in which inundation occurs, primary constituent elements (*i.e.*, space for population growth, space for reproduction and rearing of young, cover, shelter, roost sites) will be adversely affected. Similarly, primary constituent elements will be affected in breeding seasons that follow periods of inundation unless a sufficient amount of time when the area is unflooded occurs allowing regeneration of herbaceous cover and nest substrate. In addition to possible loss or degradation of tree/shrub habitat, the combination of inundation duration and depth will significantly affect herbaceous vegetation. The structure of the habitat may also change; low-lying branches in the project area may not be available for nesting or perching because of inundation.

Decreasing the acreage of suitable habitat available to willow flycatchers for population growth (a primary constituent element) by inundating up to 1,100 acres of habitat along the South Fork Kern River may leave this population vulnerable to chance environmental events. For example, the loss of even a small portion of The Nature Conservancy's Kern River Preserve to an unforeseen event (*i.e.*, fire), may leave willow flycatchers with very limited options for alternative nest sites and dispersal habitat.

Protection and intensive management of 1,100 acres of habitat, will compensate for most, if not all, of the impacts caused by the proposed action. However, even with additional acreage being protected upstream of Isabella Reservoir, a net loss of critical habitat is expected with periodic inundation of the SFWA. Although recruitment and establishment of willows may result from future reservoir operations, successful long-term establishment of seedlings may depend on the seasonal hydrological regimes in years following a high level of inundation (Jones and Stokes Associates, Inc. 1997); based on water data from the last 17 years, potential future operations, and projections that include the possibility of increased sedimentation and a resultant decrease in storage space, conditions may not continue to support habitat regeneration processes as in past years. Further, the widest portion of habitat along the South Fork Kern River will be intermittently unavailable for breeding activities in some years.

#### *Impacts to South Fork Wildlife Area Habitat in 1997-1999*

The SFWA was mostly or completely inundated in 1997 and 1998, and 1,100 acres of suitable willow flycatcher habitat was impacted each year. The Service and Corps anticipated at least 360 acres of habitat would be protected and managed for willow flycatchers in 1997 and 1,100 total acres would be protected outside of the reservoir footprint in 1998. Due to procedural delays with the land acquisition associated with landowner negotiations, appraisals, *etc.*, these protection measures have not been completed.

Studies conducted by the Corps in 1997 and 1998 measured the effects from seasonal inundation (Jones & Stokes 1999a). Prior to the 1997 water year approximately 10.5 percent of the riparian was dead due to past inundation. By mid 1999 an additional 5.2 percent of the vegetation died, due to the effects of inundation in 1998. Black willow, the primary species showing mortality, had been inundated for longer than 60 days. Sublethal impacts (leaf loss and reduced growth

rates in subsequent years) were observed in up to 50 percent of the willows in the studied area. Elevation was a significant criteria in determining the effects of inundation. Vegetation at lower elevations was inundated for longer periods (>30 days) and showed signs of mortality and at higher elevations with less inundation (<30 days) showed signs of leaf loss. In addition, herbaceous understory vegetation was adversely impacted with even low levels of inundation.

*Impacts to South Fork Wildlife Area Habitat in 2000 and Beyond*

The Corps is proposing interim management on 1,100 acres to benefit willow flycatchers in 2000 (see Project Description section for a description of these measures). These interim measures are currently being negotiated for 1,100 acres of contiguous habitat that is proposed for future acquisition and thus would yield long-term as well as short term benefits for willow flycatchers. If the purchase of 1,100 acres is completed in 2000, the Corps would operate consistent with historical management and the Service's 1997 biological opinion for the life of the project. During this one year period of interim management the Corps would, if hydrological conditions permit, inundate the Wildlife Area. If the 1,100 acres is not permanently protected in 2000, the Corps would not bring water above 2,584 feet until the 1,100 acres is permanently protected.

During this one year interim lease period several significant measures will be implemented on 1,100 acres which should improve, in the long and short term, the suitability and quality of the habitat and will result in increased productivity of willow flycatchers. Immediate removal of livestock from the most suitable nesting habitat in the riparian area should show immediate results in increased nesting attempts and the implementation of cowbird trapping should result in increased breeding success. Interim measures include survey and monitoring for willow flycatchers and nest searches to remove cowbird eggs. This will provide valuable information on the status of the population in the South Fork Valley and will guide future management actions to benefit flycatchers.

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Long term management through ownership of fee title or easement will provide additional improvements for willow flycatchers. Portions of the lands currently considered for purchase or permanent easement have been degraded or lost as a result of grazing, conversion to agricultural lands, clearing, and alteration of hydrology. These lands would be improved by grazing management or removal, monitoring and management of cowbird populations and restored by replanting native willow and cottonwood vegetation and reestablishing hydrological features. Not only would the suitability of current degraded habitats be significantly improved, additional habitats, probably 200 acres or more, would be restored to historical conditions.

Because these lands have been in private ownership, we have no baseline data on past use of this area by willow flycatchers, so it is difficult to determine the current use of the 1,100 acres by willow flycatchers or to predict the outcome of the implementation of the interim and long term measures. However, we believe willow flycatcher use of adjacent lands, *i.e.*, the SFWA and the Kern River Preserve, is an indicator of the type of use this area will receive and we estimate that between 10 to 20 additional pairs could use the 1,100 acre area.

### **Cumulative Impacts**

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Because willow flycatcher and vireo habitats typically occur in wetlands or waters of the United States, the majority of activities anticipated to affect this species within the foreseeable future are expected to have direct Federal involvement.

Other projects could result in significant cumulative effects to the species. Numerous private ranches are contiguous with the project area, and are within the area proposed to be designated as critical habitat. Currently, these lands are extensively grazed, often with year-round grazing of riparian areas; this pattern of grazing is not compatible with the restoration of willow flycatcher and vireo breeding habitat.

The Service has documented numerous cases of intentional and unintentional habitat destruction in California and New Mexico. Activities such as clearing and wood cutting are likely to occur. These activities may be persistent throughout the range of the willow flycatcher, and the Service anticipates that these types of activities may continue legally and illegally on both private and Federal lands. However, section 9 of the Act prohibits the unlawful take of the willow flycatcher. In the absence of illegal take, no loss of occupied habitat is anticipated unless and until a permit is issued pursuant to section 10(a) of the Act.

The increase of cowbirds throughout California apparently has been the result of the proliferation of suitable cowbird feeding areas (*e.g.*, golf courses, parks, stables, agricultural operations, and dairies). The Service believes that habitat destruction, cowbird parasitism, and indirect impacts resulting from a variety of projects currently affect or limit the distribution and potential expansion of willow flycatchers and vireos in the region and California as a whole.

### **Conclusion**

After reviewing the current status of the willow flycatcher and designated critical habitat, the environmental baseline for the action area, the effects of the proposed routine long term operations, implementation of the measures outlined in the project description, and the cumulative effects, it is the Service's biological opinion that long term operation of Isabella Dam and Reservoir, is not likely to jeopardize the continued existence and recovery of the willow flycatcher or the vireo.

Critical habitat for the willow flycatcher has been designated at the South Fork Kern river and within the gross pool of Isabella Reservoir, however, no destruction or adverse modification of that critical habitat is anticipated. A determination of no adverse modification and destruction of

critical habitat is based on an evaluation of the potential impacts to the South Fork Kern River valley critical habitat unit as a whole. This unit is comprised of approximately 2,700 to 3,100 acres of habitat that currently provides the primary constituent elements for the species. We anticipate that over the long term in 4 to 6 out of 10 years the SFWA will be inundated as a result of reservoir operations. Thus, in the remaining years, some portion of this habitat will be available for use by willow flycatchers. This, coupled with the proposal to manage and restore additional habitat which, we estimate, would replace lost nesting opportunities in the SFWA, was considered in our determination of no adverse modification or destruction for the critical habitat area.

### INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

#### **Amount or Extent of Take**

The Service anticipates that incidental take of willow flycatchers and vireo as a result of the proposed action will be difficult to detect or precisely quantify for the following reasons: most anticipated take will be of nests, eggs, and nestlings, which can be somewhat difficult to accurately quantify; some of the mechanisms expected to result in take, such as increased rates of nest parasitism and predation, are not entirely dependent on implementation of the proposed

action; and actual losses may be masked by annual variation in the numbers of these migratory species nesting at the SFWA and the Kern River Preserve. However, the level of take of this species can be estimated by the extent (in number of acres) of inundation in the SFWA. This is an appropriate surrogate for an actual quantification of anticipated take, because inundation of willow flycatcher/vireo habitat is the mechanism that directly or indirectly results in the anticipated take considered in the attached biological opinion. Take, due to project-related activities, is expected in the form of direct take of nests, eggs, nestlings, increased predation and parasitism, delayed nesting, reduced survival of individuals, reduced productivity of pairs, riparian habitat degradation, and diminished space for breeding, foraging, cover, and dispersal.

Based on the historical record and reinitiation criteria, the Service anticipates incidental take associated with the maximum storage capacity of the reservoir (*i.e.*, water elevations reaching approximately 2,600-2,617 feet) will inundate about 950 acres of the SFWA east of Patterson Lane, 100 acres west of Patterson Lane, and 50 acres on the North Fork Kern River during the breeding season of the willow flycatcher and vireo and the growing season of the vegetation used by these listed species.

Upon implementation of the following reasonable and prudent measures incidental take is expected to result in reduced productivity and survival of all pairs of willow flycatchers that attempt to nest in the inundation zone of the SFWA. Survival of young is expected to be reduced. In addition, the productivity of an unknown number of pairs nesting in nearby, non-inundated habitat may be reduced due to increased competition, parasitism, and predation caused by inundation in the SFWA. The survivorship and breeding potential of any vireos within the project area is anticipated to be affected. Over time, the number of willow flycatchers and vireos affected may increase or decrease depending on population size, immigration rates and nest success. This take will become exempt from the prohibitions described under section 9 of the Act for direct impacts; in addition, incidental take in the form of harm, harassment, or mortality associated with management at Isabella Reservoir on these acres of habitat will be exempt from the prohibitions described under section 9 of the Act for indirect impacts as a result of the management activities described.

### **Effect of Take**

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the willow flycatcher or vireo or destruction or adverse modification of critical habitat when the reasonable and prudent measures are implemented.

### **Reasonable and Prudent Measures**

The measures described below are non-discretionary, and must be implemented by the Corps for the exemption in section 7(o)(2) to apply. The Service believes that the following Reasonable and Prudent Measures are necessary and appropriate to minimize incidental take.

1. Minimize impacts to survival and productivity of willow flycatchers and vireos in the SFWA and the Kern River Preserve.
2. Minimize impacts to survival and productivity of willow flycatchers and vireos on protected lands.
3. Minimize injury to willow flycatchers and vireos within the SFWA, the Kern River Preserve, and on the protected area.

### Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary. These terms and conditions are adapted and modified from the Service's April 18, 1997, biological opinion (1-1-96-F-150) to reflect the current environmental baseline/status of the species and the revised project description.

1. To minimize the effects of the proposed water and land management actions on willow flycatcher and vireo in the SFWA and the Kern River Preserve, the Corps shall ensure that the following terms and conditions are met:
  - 1.1 Conduct cowbird trapping on the SFWA and the Kern River Preserve or fund the ongoing cowbird trapping program carried out by the Kern River Research Center or other organization/individuals approved by the Service for the life of the project or until cowbird trapping is determined, by the Service, to be no longer necessary. Changes to the current cowbird trapping program will be approved by the Service. ISRC
  - 1.2 To determine that the amount of permitted incidental take is not exceeded, the Corps shall continue to carry out or fund the current level of demographic surveys for willow flycatcher on the SFWA and Kern River Preserve for the life of the project. Changes to the current study design and implementation shall be approved by the Service. ISA-  
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  - 1.3 To determine that the amount of permitted incidental take is not exceeded, the Corps shall carry out or fund demographic surveys for vireo for the life of the project. The surveys shall include information on the presence and absence of vireo, documentation of any nest attempts, nest success, site fidelity, and fledgling survival in the identified area similar to the monitoring that currently occurs for the flycatcher. Currently, monitoring for vireos is conducted with Corps support. Vireos are not known to nest in the study area, however, if future nesting occurs the current study design and implementation shall be approved by the Service.

- 1.4. The Corps will provide reports to the Service on all studies and monitoring conducted under this opinion. Reports for each breeding season will be submitted annually to the Service by February 31 of each year following the study period and will be used to determine the efficacy of incidental take minimization measures.
  - 1.5. In order to determine that the amount of permitted incidental take does not preclude the survival and recovery of these two species, the Corps shall meet with the Service upon completion of the Service's recovery plans for both species to determine whether any changes in management is necessary.
  - 1.6. The Corps shall coordinate with the U.S. Forest Service and other responsible agencies to identify and implement measures to control watercraft within 100 feet of the SFWA during the breeding season. Current measures include a five mile an hour speed zone within 100 feet of riparian habitat in the North Fork Kern River area and the South Fork Delta west of Patterson Lane and signs are posted at boat launch sites to inform the public about closure areas. The Corps should assist, to the extent of their authority, the responsible agencies to implement these measures.
  - 1.7. The Corps shall implement all unmet commitments as a result of impacts from the 1996 water year as outlined in the Corps April 23, 1996, project description, and May 13, 1996, revised project description. Unmet commitments consist of the protection of an "additional 50 acres of willow flycatcher habitat". The Corps has discussed this issue with the Service and we have identified several options to meet this commitment. The Corps should initiate an appraisal of suitable properties within 60 days of the issuance of this biological opinion and make an offer to willing sellers when the appraisal process is concluded.
2. To ensure that survival and productivity of willow flycatchers and vireos are adequate on 1,150 acres of protected lands, the Corps shall:
    - 2.1. Carry out or fund demographic surveys for willow flycatcher for the life of the project. The study design and implementation shall be approved by the Service and will approximate the study currently conducted by the Kern River Research Center on the SFWA and Kern River Preserve.
    - 2.2. Conduct or fund a cowbird trapping program for the life of the project or until cowbird trapping is determined, by the Service, to be no longer necessary. The study design and implementation shall be approved by the Service and will approximate the trapping program currently conducted by the Kern River Research Center on the SFWA and Kern River Preserve.
    - 2.3. Implement or fund a habitat restoration and/or enhancement plan on the 1,150 acres of protected lands. Restoration and/or enhancement shall include, but not be limited

to, removal of nonnative invasive vegetation, fencing to exclude livestock, hydrology restoration/creation/management, and planting of native vegetation. The habitat restoration/enhancement plan shall be approved by the Service and performance criteria shall be reviewed annually.

3. To minimize injury to willow flycatchers and vireos as a result of project-related activities, the Corps shall ensure that the following term and condition is met:
  - 3.1. All willow flycatcher/vireo research and management work shall be conducted by experienced personnel who have completed the willow flycatcher training session and survey protocol training. All personnel handling willow flycatchers/vireos in nest searching and monitoring shall have experience in monitoring passerine birds in riparian habitat, and shall continue to be supervised by individuals who have experience searching for and monitoring willow flycatcher/vireo nests and have a current 10(a)(1)(A) permit. All research management work plans shall be approved by the Service.

### Reporting Requirements

The Sacramento Fish and Wildlife Office is to be notified within three working days of the finding of any dead listed wildlife species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is Karen J. Miller, Chief, Endangered Species Division at (916) 414-6620.

The Corps must provide the Service with annual reports to describe the progress of implementation of all the commitments in the Conservation Measures and Terms and Conditions sections of this biological opinion. The first report is due by February 28, 2001.

The Corps must report to the Service immediately any information about take or suspected take of listed wildlife species not authorized in this opinion. The Corps must notify the Service within 24 hours of receiving such information. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal. The Service contact person is Cay C. Goude, Assistant Field Supervisor, Endangered Species and Environmental Contaminants, at (916) 414-6700.

Any contractor or employee who during routine operations and maintenance activities inadvertently kills or injures a listed wildlife species must immediately report the incident to their representative. This representative must contact the CDFG immediately in the case of a dead or injured listed species. The CDFG contact for immediate assistance is State Dispatch at (916) 445-0045.

The U.S. Fish and Wildlife Service's Regional Office in Portland, Oregon, must be notified by the Corps immediately if any dead or sick listed wildlife species is found in or adjacent to

pesticide-treated areas. Cause of death or illness, if known, also should be conveyed to this office. The appropriate contact is Richard Hill at (503) 231-6241.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

1. Contribute funds or staff time to an annual California statewide survey effort for willow flycatchers and vireos.
2. Restore and/or enhance suitable or potential willow flycatcher/vireo habitat and implement management plans to maintain or recover habitat, reduce disturbance, and reduce brood parasitism by brown-headed cowbirds on other Corps lands.
3. Work with the Service in the development of a recovery strategy for the willow flycatcher and vireo.
4. Develop and implement an educational program for communities within the Isabella Reservoir vicinity. The program should focus on riparian and wetland ecosystems and their value to neotropical migratory birds, including the willow flycatcher and vireo.

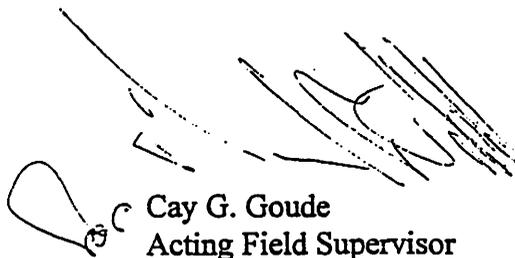
#### Recommendations for Unlisted Species

1. Conduct surveys along the South Fork Kern River (South Fork Valley) for yellow-billed cuckoo (*Coccyzus americanus occidentalis*) to determine presence/absence, abundance, breeding success, and effects of parasitism. Identify potentially suitable yellow-billed cuckoo habitat that is not currently managed for this species.
2. Work with the Service in the development of a management and conservation plan for the yellow-billed cuckoo on Corps lands in California.

**REINITIATION-CLOSING STATEMENT**

This concludes formal consultation on the proposed routine operation of Isabella Reservoir for the life of the project, including implementation of the associated conservation measures, for impacts on the willow flycatcher and vireo. As required by 50 FR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is exceeded (*i.e.* the level of storage in Isabella Reservoir exceeds frequencies and durations anticipated in Table 1 in **Description of Proposed Action** section); (2) new information reveals effects of the agency action that may impact listed species or proposed critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or proposed critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Sincerely,



Cay G. Goude  
Acting Field Supervisor

cc: ARD (ES), Portland, OR  
Field Supervisor, FWS-PFO, Phoenix, AZ  
Field Supervisor, FWS-CFO, Carlsbad, CA  
Field Supervisor, FWS-VFO, Ventura, CA  
Field Supervisor, FWS-NMFO, Albuquerque, NM  
US Forest Service, Sequoia NF, Porterville, CA  
DOI-Solicitor's Office, Sacramento, CA  
CBD, Tucson, Az  
Earth Law, Boulder, CO

Table 1. Number of years that water levels exceed elevations within the gross pool of Isabella Reservoir. Shaded area represents the threshold for reinitiation of consultation

Period	>2570	>2584	>2590	>2600
3 years	3	3	3	3
5 years	5	5	5	5
10 years	10	10	10	7*

\*provided that no year in which the reservoir exceeded 2600 feet is separated from another year in which the reservoir exceeded 2600 feet by more than two (2) consecutive years in which the reservoir is at or below 2600 feet.



Table 2. Nest predation and brood parasitism rates documented for the southwestern willow flycatcher across its range<sup>1</sup>.

Location	Pre-1993	1993	1994	1995	1996
<b>South Fork Kern River (Kern County, CA)</b>					
percent nests parasitized <sup>2</sup>	50 - 80	38*	16*	19*	11*
percent nests depredated	33 - 42	37	47	34	28
<b>San Luis Rey River (San Diego County, CA)</b>					
percent nests parasitized	-	-*	0*	0*	?
percent nests depredated	-	-	28	5	?
<b>Colorado River (Coconino County, AZ)</b>					
percent nests parasitized	≥50	100	44	100	0
percent nests depredated	-	30	78	0	0
<b>Verde River (Yavapai County, AZ)</b>					
percent nests parasitized	-	100	50	extirpated	extirpated
percent nests depredated	-	100	50		
<b>Little Colorado River (Apache County, AZ)</b>					
percent nests parasitized	-	-	22	0	57
percent nests depredated	-	-	33	28	14
<b>Rio Grande (Socorro County, NM)</b>					
percent nests parasitized	-	-	20	66	?
percent nests depredated	-	-	40	60	?
<b>Gila River (Grant County, NM)</b>					
percent nests parasitized	-	-	-	16-27	?
percent nests depredated	-	-	-	45	?

<sup>1</sup> Sources: Sogge and Tibbitts (1992), Sogge *et al.* (1993), Brown (1994), Maynard 1994, Muiznieks *et al.* (1994), Sogge and Tibbitts (1994), Cooper (1996, 1997), Sferra *et al.* (1997), Skaggs (1995), Sogge (1995a), Sogge *et al.* (1995), Parker (1997), Peterson and Sogge (1996), Spencer *et al.* (1996), Whitfield and Strong (1995), Whitfield and Enos (1996).

<sup>2</sup> Proportion of nests containing at least one brown-headed cowbird egg.

\* Brown-headed cowbird control program implemented.

**Table 3.** Rangelwide population status for the southwestern willow flycatcher based on 1996 survey data for New Mexico and California, and 1997 survey data for Arizona, Colorado, Nevada and Utah. Composite data indicated by () represents multi-year survey data for 1993-1996 for New Mexico and California and 1993-1997 for Arizona, Colorado, Nevada and Utah<sup>1</sup>.

State	No. of Sites with Territories (Composite No. of Sites)	No. of Drainages with Territories (Composite No. of Drainages)	No. of Sites (Composite) with Territories			
			with ≤5	w/ 6-20	with >20	Total No. of Territories (Composite)
AZ	42 (65)	12 (12)	33 (53)	8 (9)	1 (3)	190 (287)
CA	11 (23)	8 (14)	7 (17)	2 (4)	2 (2)	91 (130)
CO	7 (15)	6 (11)	2 (10)	4 (4)	1 (1)	69 (92)
NM	20 (30)	6 (8)	16 (26)	3 (3)	1 (1)	209 (232)
NV	5 (6)	3 (3)	4 (5)	1 (1)	0	20 (23)
UT	5 (10)	4 (7)	5 (10)	0	0	8 (16)
Total	90 (149)	39 (55)	67 (121)	18 (21)	5 (7)	587 (780)

<sup>1</sup> Based on surveys conducted at >800 historic and new sites in:

AZ (Sogge and Tibbitts 1992, Sogge *et al.* 1993, Muiznieks *et al.* 1994, Sogge and Tibbitts 1994, Sferra *et al.* 1995, 1997, Sogge 1995a, Sogge *et al.* 1995, Spencer *et al.* 1996, McKernan 1997, McKernan and Braden 1998., McCarthy *et al.* 1998);

CA (Camp Pendleton 1994, Whitfield 1994, Griffith and Griffith 1995, Holmgren and Collins 1995, Kus 1995, San Diego Natural History Museum 1995, Whitfield and Strong 1995, Griffith and Griffith 1996);

CO (T. Ireland 1994 *in litt.*, Stransky 1995);

NM (Maynard 1995, Cooper 1996, 1997, Parker 1997, Skaggs 1995, Williams 1997);

NV (C. Tomlinson 1995 *in litt.*, 1997); UT (McDonald *et al.* 1995, 1997, Sogge 1995b).

Site is defined as a specific location (e.g., Isabella Reservoir, Prado Reservoir, etc.) where breeding has occurred.

Territory is defined as each known breeding pair within each site

Systematic surveys have not been conducted in Texas. For sites surveyed multiple years, highest single-year estimate of territories was used to tabulate status data. Tabulations do not include documented extirpations within survey period. Thus, individual State estimates and rangelwide totals may be biased upward.

**Table 4. Agency actions that have undergone section 7 consultation and levels of incidental take permitted for the southwestern willow flycatcher rangewide.**

Action (County)	Year	Federal Agency <sup>1</sup>	Incidental Take Anticipated
<b>Arizona</b>			
Cedar Bench Allotment (Yavapai)	1995	Tonto NF	Indeterminable
Tuzigoot Bridge (Yavapai)	1995*	NPS	None
Windmill Allotment (Yavapai)	1995	Coconino NF	Loss of 1 nest annually/for 2 years
Solomon Bridge (Graham)	1995	FHWA	Loss of 2 territories
Tonto Creek Riparian Unit (Maricopa)	1995	Tonto NF	Indeterminable
E. Roosevelt Lk. Allotment (Maricopa)	1995	Tonto NF	Indeterminable
Cienega Creek (Pima)	1996	BLM	1 nest annually by cowbird parasite.
Glen Canyon Spike Flow (Coconino)	1996	USBR	Indeterminable
Verde Valley Ranch (Yavapai)	1996*	Corps	Loss of 2 flycatcher territories
Modified Roosevelt Dam (Gila/Maricopa)	1996*	USBR	Loss of 45 territories; reduced productivity/ survivorship 90 birds
Lower Colorado River Ops (Mohave/Yuma)	1997*	USBR	Indeterminable
Blue River Road (Greenlee)	1997	Apache NF	Indeterminable
Skeleton Ridge (Yavapai)	1997	Tonto NF	Indeterminable
White Canyon Fire - Emergency (Pinal)	1997	BLM	Harassment of 4 pairs
U.S. Hwy 93 Wickenburg (Mohave/Yavapai)	1997	FHWA	Harassment of 6 birds in 3 territories and 1 bird killed/decade
Safford District Grazing Allotments (Greenlee, Graham, Pinal, Cochise & Pima)	1997	BLM	Indeterminable
Lower Gila Resource Plan Amend. (Maricopa, Yavapai, Pima, Pinal, La Paz & Yuma)	1997	BLM	Indeterminable
Storm Water Permit for Verde Valley Ranch (Yavapai)	1997	EPA	Indeterminable
Gila River Transmission Structures (Graham)	1997	AZ Electric Power Coop. Inc.	Indeterminable
Arizona Strip Resource Mgmt Plan Amendment (Mohave)	1998	BLM	Harm of 1 nest every 3 years
CAP Water Transfer Cottonwood/Camp Verde (Yavapai/Maricopa)	1998	USBR	Indeterminable
Cienega Creek Stream Restore Project (Pima)	1998	BLM	Harassment of 1 bird

**Table 4. Agency actions that have undergone section 7 consultation and levels of incidental take permitted for the southwestern willow flycatcher rangewide.**

Kearny Wastewater Treatment (Pinal)	1998	FEMA	Indeterminable
Fort Huachuca Programatic (Cochise)	1998	DOD	in consultation
SR 260 Cottonwood to Camp Verde (Yavapai)	1998	FHWA	Indeterminable
Wildlife Services (ADC) Nationwide consultation (SWWF in AZ only)	1998	Wildlife Services	Indeterminable
Alamo Lake Reoperation (LaPaz, Mohave)	1998	Corps	Loss of 1 nest w/ 2 eggs in 20 years due to projected inundation
<b>California</b>			
Prado Basin (Riverside/San Bernardino)	1994	Corps	None
Orange County Water District (Orange)	1995	Corps	None
Temescal Wash Bridge (Riverside)	1995	Corps	Harm to 2 flycatchers
Camp Pendleton (San Diego)	1995	DOD	Loss of 4 flycatcher territories
Lake Isabella Operations 1996 (Kern)	1996	Corps	Inundation 700 ac critical habitat; reduced productivity 14 pairs
Lake Isabella Long-Term Operations (Kern)	1997	Corps	Annual inundation 1,100 ac critical habitat
<b>Nevada</b>			
Gold Properties Resort (Clark)	1995	BIA	Harm to 1 flycatcher from habitat loss
Las Vegas Wash. Pabco Road Erosion Control	1998	Corps	Harm to 2-3 pairs of flycatchers
<b>New Mexico</b>			
Corrales Unit, Rio Grande (Bernalillo)	1995	Corps	None
Rio Puerco Resource Area	1997	BLM	None
Farmington District Resource Management Plan	1997*	BLM	None
Mimbres Resource Area Management Plan	1997*	BLM	1 pair of flycatchers
Belen Unit, Rio Grande (Valencia)	1998	Corps	Consultation in progress

BIA = Bureau of Indian Affairs; BLM = Bureau of Land Management; Corps = Army Corps of Engineers; DOD = Dept. of Defense; EPA = Environmental Protection Agency; FEMA = Federal Emergency Management Agency; FHWA = Federal Highway Administration; NF = National Forest; NPS = National Park Service; USBR = U.S. Bureau of Reclamation

\* Jeopardy Biological Opinion

**Table 6.** Offspring successfully fledged during inundated (1995 and 1996) and non-inundated (1992 and 1994) years in the South Fork Wildlife Area, Kern County, CA.

Year	#Pairs (A)	# nests	# eggs laid	percent eggs hatched	#fledged/pair	percent pairs successful (B)	percent nests successful	# fledged-successful pair	#fled/nest (C)
1992	2	7	9	78	1	50	14	2	0.29
1994	4	8	17	59	2.5	100	50	2.5	1.25
1995	6	17	38	18	0.71	33	12	2.5	0.29
1996	2	3	7	57	2 (D)	50	33	4.0	1.3

<sup>(A)</sup>The number of monitored pairs actively nesting (as defined in Whitfield 1993, 1994, Whitfield and Strong 1995) in the South Fork Wildlife Area.

<sup>(B)</sup>The total number of monitored pairs that successfully fledged at least one offspring in the South Fork Wildlife Area.

<sup>(C)</sup>The total number of chicks fledged from monitored nests in the South Fork Wildlife Area.

<sup>(D)</sup>Two pairs nested: one fledged 4 young the other fledged 0 young.

**Table 7.** Extent of inundation within Isabella Reservoir and the South Fork Wildlife Area in recent consecutive years during growing season (1993 to 1997).

Elevation	Acreage of habitat	# times inundated in consecutive years*
>2,570	100	5
>2,584	100-460	3
>2,591	460-1,100	3
2,600	1,100	3

\*does not mean continuously inundated

**Table 8.** Number of days per year and percentage of growing season (March through September) that habitat is inundated at various elevations from 1993-1998 at Isabella Reservoir and the South Fork Wildlife Area.

Elevation	1993	1994	1995	1996	1997	1998
>2,570	246 days 55 percent	117 days 55 percent	195 days 91 percent	365 days 100 percent	365 days 100 percent	365 days 100 percent
>2,584	78 days 35 percent	0	135 days 63 percent	163 days 76 percent	226 days 95 percent	186 days 83 percent
>2,591	18 days 8 percent	0	89 days 41 percent	111 days 52 percent	112 days 39 percent	126 days 56 percent
>2,600	0 days	0	38 days 18 percent	55 days 26 percent	0	56 days 26 percent

**Table 5.** Population size, number young fledged, and Mayfield nest success on the South Fork Kern River (Kern River Preserve and South Fork Wildlife Area), CA, 1989 - 1999.

SURVEY ESTIMATES	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Population size (in pairs)	44	41	31	27	34	34	34	29	38	26	23
Number young fledged	29	20	24	33	37	42	40	58	37	40	26
Percent nest success-Mayfield*	23	18	16	32	36	40	43	61	30	52	34

\* Mayfield nest success is the probability that a nest will successfully fledge at least one young

## REFERENCES CITED

- Arizona Game and Fish Department. 1988. Threatened native wildlife in Arizona. Arizona Game and Fish Department Publication. Phoenix, Arizona. 32 pp.
- Army Corps of Engineers. 1978. Reservoir Regulation Manual, Isabella Lake.
- Army Corps of Engineers. 1996. Project Description for Isabella Dam and Lake, Routine Operating Procedures for Long Term Operations.
- Barlow, J. 1962. Natural history of the Bell vireo, *Vireo bellii*. Audubon. Univ. Kansas Publ. Mus. Nat. Hist. 12:241-296.
- Bent, A.C. 1950. Life histories of North American wagtails, shrikes, vireos, and their allies. U.S. Nat. Mus. Bull. 197.
- Bent, A.C. 1963. Life histories of North American flycatchers, larks, swallows and their allies. Dover Press, New York, New York. 551 pp.
- Brittingham, M.C. and S.A. Temple. 1983. Have cowbirds caused forest songbirds to decline? *BioScience* 33:31-35.
- Brown, B.T. 1988a. Breeding Ecology of a Willow Flycatcher Population in Grand Canyon, AZ. *Western Birds* 19:25-33.
- Brown, B.T. 1988b. Monitoring bird population densities along the Colorado River in Grand Canyon: 1987 breeding season. Final Report to the Glen Canyon Environmental Studies. Bureau of Reclamation, Salt Lake City, Utah. 26 pp.
- Brown, B.T. 1991. Status of nesting willow flycatchers along the Colorado River from Glen Canyon Dam to Cardenas Creek, Arizona. Endangered Species Report No. 20. U.S. Fish and Wildlife Service, Ecological Services, Phoenix, Arizona.
- Browning, M.R. 1993. Comments on the taxonomy of *Empidonax traillii* (willow flycatcher). *Western Birds* 24:241-257.
- California Department of Fish and Game. 1992. State and Federal endangered and threatened animals of California (Revised 1992). California Department of Fish and Game, Natural Heritage Division, Sacramento, California. 13pp.
- Camp Pendleton Marine Corps Base. 1994. Biological Assessment: Riparian and Estuarine Habitat.
- Chapin, E.A. 1925. Food habits of the vireos. U.S. Department of Agriculture Bulletin 1355.

- Conway, W.G. 1980. An overview of captive propagation. In: M.E. Soule, and B.A. Wilcox (eds.) Conservation biology: an evolutionary-ecological perspective. Pp. 199-208. Sinauer Assoc., Sunderland, Mass.
- Cooper, C. A. 1996. Summary of 1995 Surveys for Willow Flycatchers in New Mexico. Santa Fe, New Mexico: New Mexico Department of Game and Fish. 27 pp.
- Cooper, C. A. 1997. Statewide summary of 1996 Surveys for Willow Flycatchers in New Mexico. Contract #96-516.81. Santa Fe, New Mexico: New Mexico Department of Game and Fish. 30 pp.
- Dawson, W.L. 1923. Birds of California. South Moulton Co., San Diego, CA.
- del Nevo, A.J., S.A. Laymon, J.R. McBride, R.M. Marshall, R.D. Ohmart, and M.K.Sogge. 1998. An assessment of the status and habitat use of southwestern willow flycatchers in relation to the operation of Isabella reservoir within the Kern river valley. Final report of the California subcommittee of the southwestern willow flycatcher recovery team. June 22, 1998. 35 pp.
- DeLoach, C.J. 1991. Saltcedar, an exotic weed of western North American riparian areas: a review of its taxonomy, biology, harmful and beneficial values, and its potential for biological control. Report to the Bureau of Reclamation, Boulder City, NV, Contract No. 7-AG-30-04930.
- Dooling, R. 1978. The behavior and psychophysics of hearing in birds. *Journal of the Acoustic Society of America* 63 (Suppl. 1):S4.
- Drost, C.A., M.K. Sogge, and E. Paxton. 1998. Preliminary Diet Study of the Endangered Southwestern Willow Flycatcher. Report to U.S. Bureau of Reclamation. U.S.G.S. Biological Resources Division/Colorado Plateau Res. Station/N. Arizona University. 26 pp.
- Dufour, P. 1980. Effects of noise on wildlife and other animals: review of research since 1971. United States Environmental Protection Agency; EPA 550/9-80-100. 97 pp.
- Fay, R. And A. Feng. 1983. Mechanisms for directional hearing among nonmammalian vertebrates. *J. Acoust. Soc. Amer.* 73(Suppl.1):S18.
- Fitch, 1958. Home ranges, territories, and seasonal movements of vertebrates in the Natural History Reservation. *Univ. Of Kansas Publ. Mus. Of Nat. Hist.* 11(3):63-326.
- Fletcher, J. Et al. 1971. Effects of noise on wildlife and other animals. U.S. Environmental Protection Agency. NTID 300.5. 74pp.
- Friedmann, H. 1963. Host relations of the parasitic cowbirds. *U.S. Nat.Mus. Bull.* 233.

- Gaines, D. 1974. A new look at the nesting riparian avifauna of the Sacramento Valley, California. *Western Birds* 5:61-79.
- Gaines, D. 1977. The status of selected riparian forest birds in California. Unpubl. Report to California Department of Fish and Game, Sacramento, CA.
- Garrett, K. And J. Dunn. 1981. *Birds of southern California: status and distribution*. Los Angeles Audubon Society. 408 pp.
- Gill, C.J. 1970. The flooding tolerance of woody species-a review. *Fore. Sci.* 31:671-688.
- Goldwasser, S. 1978. Distribution, reproductive success and impact of nest parasitism by brown-headed cowbirds on least Bell's vireos. State of California. The Resources Agency, California. Department of Fish and Game. Fed. Aid. Wildl. Rest. W-54-R-10, Nongame Wildl. Prog. Job W 1.5.1, Final Report.
- Goldwasser, S. 1981. Habitat requirements of the least Bell's vireo. California Department of Fish and Game Final Report, Job IV-38.1.
- Goldwasser, S., D.Gaines, and S. Wilbur. 1980. The least Bell's vireo in California: a de facto endangered race. *American Birds* 34:742-745.
- Gray, M.V. and J. Greaves. 1984. Riparian forest as habitat for the least Bell's vireo. In: R. Warner, and K. Hendrix (eds.). *California riparian systems: ecology, conservation and productive management*. Univ. Calif. Press, Davis, Ca.
- Green, W.E. 1947. Effects of water impoundment on tree mortality and growth. *Journal of Forestry* 45:118-120.
- Griffith, J.T and J.C. Griffith. 1995. Brown-headed cowbird trapping and least Bell's vireo recovery on Marine Corps base camp Pendleton, 1983-1993. Abstracts of the North American Research Workshop on the Ecology and Management of Cowbirds. The Nature Conservancy of Texas, Austin. 88 pp.
- Griffith, J.T and J.C. Griffith. 1996. Brown-headed cowbird trapping and the endangered least Bell's vireo: a management success story. 33 pp.
- Grinnell, J. and A. Miller. 1944. The distribution of birds of California. *Pacific Coast Avifauna*. No. 26.
- Gunn, W. And J. Livingston (eds.). 1974. Disturbance to birds by gas compressor noise simulators, aircraft, and human activity in the Mackenzie Valley and North Slope, 1972. *Arctic Gas Biol. Rep.Ser.* 14. 280 pp.
- Hanna, W.C. 1928. Notes on the dwarf cowbird in southern California. *Condor* 30:161-162.

- Harrison, H.H. 1979. A field guide to western birds' nests of 520 species found breeding in the United States west of the Mississippi River. Houghton Mifflin Company, Boston, Massachusetts. 279 pp.
- Holmgren, M. A. and P. W. Collins. 1995. Interim report on the distribution, breeding status, and habitat associations of seven Federal special-status bird species and Brown-headed Cowbirds at Vandenberg Air Force Base, Santa Barbara County, California. Museum of Systematics and Ecology, Department of Ecology, Evolution, and Marine Biology, University of California: Santa Barbara, California. Environmental Report No. 3.
- Howell, S.N.G. and S. Webb. 1995. A guide to the birds of Mexico and Northern Central America. Oxford University Press. New York. 851 pp.
- Hubbard, J.P. 1987. The Status of the Willow Flycatcher in New Mexico. Endangered Species Program, New Mexico Department of Game and Fish, Santa Fe, New Mexico. 29 pp.
- Huels, T. 1993. Unpublished data, Vertebrate Museum, University of Arizona, Tucson, Arizona.
- Hull, T. and D. Parker. 1995. The Gila Valley revisited: 1995 survey results of willow flycatchers found along the Gila River near Gila and Cliff, Grant County, New Mexico. Prepared by Applied Ecosystem Management, Inc. for the Phelps Dodge Corporation. 25 pp.
- Hunter, W.C., B.W. Anderson, R.D. Ohmart. 1987. Avian community structure changes in a mature floodplain forest after extensive flooding. *J. Wildl. Manage.* 51(2):495-502.
- Jones, B. 1985. A report on the status of the least Bell's vireo on the San Diego, Sweetwater and San Luis Rey Rivers, San Diego County, California. Unpublished report.
- Jones and Stokes Associates, Inc. 1996. Draft. Biological assessment for threatened and endangered species for the U.S. Army Corps of Engineers long term operations and management of Isabella Reservoir. August 13, 1996. (JSA 96-046) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers, Sacramento, CA.
- Jones and Stokes Associates, Inc. 1997. Vegetation mortality and other adverse effects resulting from 1996 operations at Lake Isabella. March 19, 1997. (JSA 96-046) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers, Sacramento, CA.
- Jones and Stokes Associates, Inc. 1998 a. 1997 brown-headed cowbird monitoring-summary report. January 1998. (JSA 95-D-0003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Jones and Stokes Associates, Inc. 1998 b. Evaluate the Effects of Project Operation on Flycatcher Habitat - Describe Vegetation Mortality and Other Impacts Resulting from 1997

- Operations. January 1998. (JSA 95-D-0003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Jones and Stokes Associates, Inc. 1998 c. Evaluation of demographic and census data: 1997 census for southwestern willow flycatchers and least Bell's vireos. January 1998. (JSA 95-D-0003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Jones and Stokes Associates, Inc. 1998 d. Existing and potential southwestern willow flycatcher habitat in the Kern River valley. July 1998. (JSA 95-D-0003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Jones & Stokes Associates, Inc. 1998 d. 1998 Census for southwestern willow flycatchers and Least Bell's vireos—summary report. (JSA 95-D-0003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Jones and Stokes Associates, Inc. 1999 a. Evaluation of the effects of 1997 and 1998 Isabella Dam and lake operations on riparian vegetation. October 1999. (JSA 95-D-003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Jones and Stokes Associates, Inc. 1999 b. 1998 southwestern willow flycatcher and least Bell's vireo censuses. January 1999. (JSA 95-D-003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Jones and Stokes Associates, Inc. 1999 c. Brown-headed cowbird monitoring. January 1999. (JSA 95-D-003) Sacramento, CA. Prepared for the U.S. Army Corps of Engineers.
- Keller, C.; Robbins, C.S.; Hatfield, J.S. 1993. Avian communities in riparian forests of different widths in Maryland and Delaware. *Wetlands*. 13(2):137-144
- King, J.R. 1955. Notes on the life history of Traill's flycatcher (*Empidonax traillii*) in southeastern Washington. *The Auk*. 72:148-173.
- Knighton, M.D. 1981. Growth response of speckled alder and willow to depth of flooding. U.S.D.A. Forest Service, North Central Forest Experiment Station, St. Paul, Minn.
- Knudsen, E. 1978. Strategies for sound localization in birds. *J. Acoust. Soc. Amer.* (Suppl.1):S4.
- Kus, B.E. 1990. Status of the least Bell's vireo at the Sweetwater and San Diego Rivers, San Diego County, California, 1989. Prepared for the U.S. Fish and Wildlife Service, Portland, OR.
- Kus, B.E. 1994. Distribution and breeding activity of the least Bell's vireo at the San Diego River, 1992-1993. Prepared for the California Department of Transportation, District 11.

- Kus, J. 1995. The status of the least Bell's vireo and southwestern willow flycatcher at Camp Pendleton, California, in 1995. Department of Biology, San Diego State University, San Diego, California.
- Kus, B.E. and K.L. Miner. 1989. The use of non-riparian habitats by least Bell's vireos. In: Proceedings of the California Riparian Systems Conference: protection, management and restoration for the 1990s; September 22-24; Davis, CA. Dana L. Abell ed., Gen. Tech. Rep. PSW-110, Berkeley, CA, pp. 299-303.
- Ligon, J.S. 1961. New Mexico Birds and where to find them. The University of New Mexico Press, Albuquerque, New Mexico.
- Linton, C.B. 1908. Notes from Buena Vista Lake, May 20 to June 16, 1907. *Condor* 10:196-198.
- Mayfield, H.F. 1977a. Brown-headed cowbird: agent of extermination? *American Birds* 31:107-113.
- Mayfield, H.F. 1977b. Brood parasitism: reducing interactions between Kirtland's warblers and brown-headed cowbirds. Chapter 11 in *Endangered birds: management techniques for preserving threatened species* (S.A. Temple, ed.). University of Wisconsin Press, Madison Wisconsin.
- Maynard, W.R. 1995. Summary of 1994 survey efforts in New Mexico for southwestern willow flycatcher (*Empidonax traillii extimus*). Prepared by the Research Sub-committee of Arizona Partners in Flight. 5 pp.
- McCabe, R.A. 1991. The little green bird: ecology of the willow flycatcher. Palmer Publications, Inc., Amherst, Wisconsin. 171 pp.
- McCarthy T.D., C.E. Paradzick, J.W. Rourke, M.W. Sumner, and R.F. Davidson. 1998. Arizona Partners In Flight southwestern willow flycatcher survey: 1997 Survey and Nest Monitoring Report. Arizona Game and Fish Department Technical Report XX.
- McCaskie, G. 1969. Southern Pacific Coast region. *Audubon Field Notes* 23:106-112.
- McCaskie, G. and E. Pugh. 1965. Southern Pacific Coast region. *Audubon Field Notes* 19:76-82.
- McDonald, K.P., J. Snider, L.C. Peterson, M. St. Germain, and S. Staats. 1995. Results of 1995 southwestern willow flycatcher surveys in the Virgin River drainage and southern Utah. Publication No. 95-17, Utah Division of Wildlife Resources, Cedar City, UT. 28 pp.

- McDonald, K.P., L.C. Peterson, and M. St. Germain. 1997. Results of 1996 Surveys for southwestern willow flycatchers in the Upper Virgin River drainage and southern Utah. Publication No. 97-3, Utah Division of Wildlife Resources, Cedar City, UT. 29 pp.
- McGreen, D.S. 1972. Cowbird-host relationships. *The Auk* 89:360-380.
- McKernan, R. 1997. Status of the southwestern willow flycatcher along the lower Colorado River: Year 1, 1996. Report to the Bureau of Reclamation, Boulder City, N.V. and the U.S. Fish and Wildlife Service, Carlsbad, CA. 55 pp.
- McKernan, R. and G. Braden. 1998. Status of the southwestern willow flycatcher along the lower Colorado River: Year 2, 1997. Report to the Bureau of Reclamation, Boulder City, N.V. and the U.S. Fish and Wildlife Service, Carlsbad, CA. 64 pp.
- Miller, J. 1974. Effects of noise on people. *J. Acoust. Soc. Amer.* 56 (3): 729-764.
- Miner, K.L. 1989. Foraging ecology of the least Bell's vireo, *Vireo bellii pusillus*. Unpublished Master's thesis, San Diego State University.
- Muiznieks, B.D., T.E. Corman, S.J. Sferra, M.K. Sogge, and T.J. Tibbitts. 1994. Arizona Partners In Flight 1993 southwestern willow flycatcher survey. Technical Report 52. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, Arizona. 25 pp.
- Muiznieks, B.D., S.J. Sferra, T.E. Corman, M.K. Sogge, and T.J. Tibbitts. 1994. Arizona Partners In Flight southwestern willow flycatcher survey, 1993. Draft report: Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix, Arizona. Draft of April 1994. 28 pp.
- New Mexico Department of Game and Fish. 1988. Handbook of species endangered in New Mexico, Santa Fe, New Mexico.
- Overmire, T.G. 1962. Nesting of Bell vireo in Oklahoma. *Condor* 64:75.
- Paxton, E., J. Owen, and M. Sogge. 1996. Southwestern willow flycatcher response to catastrophic habitat loss. Colorado Plateau Research Station, U.S. Geological Survey Biological Resources Division, Northern Arizona University, Flagstaff, AR.
- Paxton, E., S.M. Langridge, and M.K. Sogge. 1997. Banding and Population Genetics of Southwestern willow flycatchers in Arizona-1997 Summary Report. Colorado Plateau Research Station. U.S. Geological Survey Biological Resources Division. Northern Arizona University, Flagstaff, AZ. 63 pp.

- Parker, D. 1997. The Gila Valley Revisited: 1997 Survey Results of Willow Flycatchers Found Along the Gila River Near Gila and Cliff, Grant County, New Mexico. Unpublished report to Phelps Dodge Corporation. 11 pp.
- Peterson, R.T. 1990. A field guide to western birds. Third edition. Houghton Mifflin Company, Boston, Massachusetts. 432 pp.
- Phillips, A.R. 1948. Geographic variation in *Empidonax traillii*. *The Auk* 65:507-514.
- Phillips, A.R., J. Marshall, and G. Monson. 1964. The Birds of Arizona. University of Arizona Press, Tucson, Arizona. 212 pp.
- Pike, J. and L. Hays, 1993. Status and management of the least Bell's vireo within the Prado Basin, California, 1986-1993. Prepared for The Nature Conservancy and Orange County Water District, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and California Department of Fish and Game.
- Pitelka, F. And E. Koestner. 1942. Breeding behavior of Bell's vireo in Illinois. *Wilson Bulletin* 54:97-106.
- Ridgely, R.S. and G. Tudor. 1994. The Birds of South America: Suboscine Passerines. University of Texas Press, Austin, Texas. xix pp.
- Rowley, J.S. 1930. Observations on the dwarf cowbird. *Condor* 32:130-131.
- Salata, L. 1980. Status and distribution of the least Bell's vireo, Camp Pendleton Marine Corps Base, 1980. Unpubl. Rept. Natural Res. Off., Camp Pendleton.
- Salata, L. 1981. Least Bell's vireo research, Camp Pendleton Marine Corps Base, San Diego County, California, 1981. Unpubl. Rept. Natural Res. Off., Camp Pendleton.
- Salata, L. 1983. Status of the least Bell's vireo on Camp Pendleton, California: report on research done in 1983. Unpubl. Report, U.S. Fish and Wildlife Service, Laguna Niguel, CA.
- Salata, L. 1986. Status of the least Bell's vireo on Camp Pendleton in 1985. Unpubl. Rept. Prepared for Natural Resources Office, Marine Corps Base Camp Pendleton, CA.
- San Diego Natural History Museum. 1995. *Empidonax traillii extimus* in California. The willow flycatcher workshop. 17 November 1995. 66 pp
- Scherzinger, W. 1979. On the relations of predators of Hazel Grouse (*Bonasa bonasa*). *Vogelwelt* 100 (6):325-217. English translation of abstract.

- Senner, J.W. 1980. Inbreeding depression and the survival of zoo populations. In: M.E. Soule and B.A. Wilcox (eds.) Conservation biology; an evolutionary-ecological perspective. Pp. 209-224. Sinauer Assoc., Sunderland, Mass
- Sferra, S.J., R.A. Meyer, and T.E. Corman. 1995. Arizona Partners In Flight 1994 southwestern willow flycatcher survey. Final Technical Report 69. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Phoenix, Arizona. 46 pp.
- Sferra, S.J., T.E. Corman, C.E. Paradzick, J.W. Rourke, J.A. Spencer, and M.W. Sumner. 1997. Arizona Partners In Flight southwestern willow flycatcher survey: 1993-1996 summary report. Arizona Game and Fish Department Technical Report 113. 104 pp.
- Short, L.L. and R.S. Crossin. 1967. Notes of the avifauna of northwestern Baja California. Trans. San Diego Soc. Nat. Hist. 14:283-299.
- Skaggs, R.W. 1995. Population size, breeding biology, and habitat of willow flycatchers in the Cliff-Gila Valley, New Mexico. New Mexico Department of Game and Fish, Sante Fe, New Mexico. 38 pp.
- Smith, F. 1977. A short review of the status of riparian forests in California In A. Sands (ed.). Riparian forest in California: their ecology and conservation. Pp. 1-2. Publ. 15.
- Sogge, M.K. 1995a. Southwestern willow flycatcher (*Empidonax traillii extimus*) monitoring at Tuzigoot National Monument. 1995 progress report to the National Park Service. National Biological Service Colorado Plateau Research Station/North Arizona University, Flagstaff, Arizona. 20 pp.
- Sogge, M.K. 1995b. Southwestern willow flycatcher surveys along the San Juan River, 1994-1995. Final report to the Bureau of Land Management, San Juan Resource Area. National Biological Service Colorado Plateau Research Station/ North Arizona University, Flagstaff, Arizona. 27 pp.
- Sogge, M.K. 1995c. Southwestern willow flycatchers in the Grand Canyon. Pages 89-91, in E.T. LaRoe, G.S. Farris, C.E. Puckett, P.D. Doran, and M.J. Mac eds. Our living resources: a report to the nation on the distribution, abundance, and health of U.S. plants, animals, and ecosystems. Department of Interior, National Biological Service, Washington, D.C.
- Sogge, M.K. and T.J. Tibbitts. 1992. Southwestern willow flycatcher (*Empidonax traillii extimus*) surveys along the Colorado River in Grand Canyon National Park and Glen Canyon National Recreation Area. National Park Service Cooperative Park Studies Unit/Northern Arizona University, Flagstaff, Arizona. 43 pp.
- Sogge, M.K. and T.J. Tibbitts. 1994. Distribution and status of the southwestern willow flycatcher along the Colorado River in the Grand Canyon - 1994. Summary Report.

National Biological Survey Colorado Plateau Research Station/North Arizona University. Flagstaff, Arizona. 37 pp.

Sogge, M.K., T.J. Tibbitts, and S.J. Sferra. 1993. Status of the southwestern willow flycatcher along the Colorado River between Glen Canyon Dam and Lake Mead - 1993. Summary Report. National Park Service Cooperative Park Studies Unit/Northern Arizona University/ U.S. Fish and Wildlife Service, and Arizona Game and Fish Department, Flagstaff, Arizona. 69 pp.

Sogge, M. K., R. M. Marshall, S. J. Sferra, and T. J. Tibbitts. 1997. A southwestern willow flycatcher survey protocol and breeding ecology summary. National Park Service/Colorado Plateau Res. Station/N. Arizona University, Tech. Rept. NRTR-97/12. 37 pp.

Spencer, J. A., S. J. Sferra, T. E. Corman, J. W. Rourke, and M. W. Sumner. 1996. Arizona Partners In Flight 1995 southwestern willow flycatcher survey. Technical Report 97, March 1996. Arizona Game and Fish Department, Phoenix. 69 pp.

Soule, M.E. 1980. Thresholds of survival maintaining fitness and evolutionary potential. In M. E. Soule and B.A. Wilcox (eds.). Pp. 151-169. Conservation biology: an evolutionary-ecological perspective. Sinauer Assoc., Sunderland, Mass.

Stiles, F.G. and A.F. Skutch. 1989. A guide to the birds of Costa Rica. Comstock, Ithaca, New York. 364 pp.

Stransky, K. 1995. 1995 field survey by the Colorado Division of Wildlife, southwestern willow flycatcher. Colorado Division of Wildlife, Grand Junction. 21 pp.

Teskey, R.O. and M. Hinkley. 1977. Impact of water level changes on woody riparian and wetland communities. Vol. 1 Plant and Soil Responses to Flooding. University of Missouri-Columbia, Columbia, Missouri. 30 pp.

Tibbitts, T.J., M.K. Sogge, and S.J. Sferra. 1994. A survey protocol for the southwestern willow flycatcher (*Empidonax traillii extimus*). Technical Report NPS/NAUCPRS/NRTR-94/04. National Park Service Colorado Plateau Research Station, Flagstaff, Arizona. 24 pp.

Tomlinson, C. 1997. Summary of surveys in 1997 for southwestern willow flycatchers in southern Nevada.

Unitt, P. 1984. The birds of San Diego County. *San Diego Society of Natural History*.

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

U.S. Fish and Wildlife Service. 1986. The least Bell's vireo in the Prado Basin and environs, 1985. Prepared for the Army Corps of Engineers, Los Angeles District.

- U.S. Fish and Wildlife Service. 1989. Notice of review: animal candidate review for listing as endangered or threatened species. *Federal Register* 54:554.
- U.S. Fish and Wildlife Service. 1993. Notice of 12-month petition finding/proposal to list *Empidonax traillii extimus* as an endangered species, and to designate critical habitat. *Federal Register* 58:39494-39522.
- U.S. Fish and Wildlife Service. 1995a. Final rule determining endangered status for the southwestern willow flycatcher. *Federal Register* 60:10694-10715.
- U.S. Fish and Wildlife Service. 1995. Status of the least Bell's vireo and southwestern willow flycatcher at Camp Pendleton Marine Corps Base, California in 1993. Prepared for the U.S. Marine Corps, Environmental and Natural Resources Management Office, Camp Pendleton.
- U.S. Fish and Wildlife Service. 1997. Final rule determining critical habitat for the southwestern willow flycatcher. *Federal Register* 62:39129-39147.
- U.S. Fish and Wildlife Service. 1997. Final rule determining critical habitat for the southwestern willow flycatcher, correction. *Federal Register* 62:44228.
- Walkinshaw, L.H. 1966. Summer biology of Traill's flycatcher. *Wilson Bulletin* 78:31-46.
- Wheelock, I.G. 1912. Birds of California: an introduction to more than three hundred common birds of the state and adjacent lands. A.C. McClurg and Company, Chicago, Illinois.
- Whitfield, M.J. 1990. Willow flycatcher reproductive response to brown-headed cowbird parasitism. Masters Thesis, California State University, Chico, California State University, Chico, California.
- Whitfield, M.J. 1993. Brown-headed cowbird control program and monitoring for willow flycatchers, South Fork Kern River, California. Draft report to California Department of Fish and Game, Contract #FG 2285., Weldon, California.
- Whitfield, M.J. 1994. A brown-headed cowbird control program and monitoring for willow flycatchers, South Fork Kern River, California. 1994. Prepared for California Department of Fish and Game. Kern River Research Center, Weldon, California.
- Whitfield, M.J., Cohen, E.B., and C.D. Otahal. 1999a. Southwestern willow flycatcher surveys, nest monitoring, and removal of brown-headed cowbirds on the South Fork Kern River, California in 1999. Prepared for the U.S. Army Corps of Engineers and the California Department of Fish and Game.

- Whitfield, M.J., K.M. Enos, and S.P. Rowe. 1999b. Reproductive response of the southwestern willow flycatcher (*Empidonax traillii extimus*) to the removal of brown-headed cowbirds, South Fork Kern River, California in 1999. Final Report. Prepared for the U.S. Army Corps of Engineers, Sacramento District.
- Whitfield, M.J. and K.M. Enos. 1996. Final Report-A brown-headed cowbird control program and monitoring for the southwestern willow flycatcher, South Fork Kern River, California, 1996. Prepared for the U.S. Army Corps of Engineers.
- Whitfield, M.J., Enos, K.M., and S.P. Rowe. 1998. Final Report-Reproductive response of the southwestern willow flycatcher to the removal of brown-headed cowbirds in 1997. June, 1998. Prepared for the U.S. Army Corps of Engineers and the California Department of Fish and Game.
- Whitfield, M.J. and K.M. Enos. 1998. Final Report-Reproductive response of the southwestern willow flycatcher to the removal of brown-headed cowbirds in 1998. December, 1998. Prepared for the U.S. Army Corps of Engineers and the California Department of Fish and Game.
- Whitfield, M.J. and C.M. Strong. 1995. A brown-headed cowbird control program and monitoring for willow flycatchers, South Fork Kern River, California. 1994. Prepared for California Department of Fish and Game, Bird and Mammal Conservation Program Report 95-4, Sacramento, California.
- Wilbur, S. 1980. Status report on the least Bell's vireo. Unpubl. Rept. U.S. Fish and Wildlife Service, Portland, OR.
- Wilbur, S. 1981. The least Bell's vireo in Baja California, Mexico. *Western Birds* 11:129-133.
- Wilcox, B. 1980. Insular ecology and conservation. In M.E. Soule, and B.A. Wilcox (eds.) Pp. 95-118. *Conservation biology: an evolutionary-ecological approach*. Sinauer Assoc., Sunderland, Mass.
- Willard, F.C. 1912. A week afield in southern Arizona. *The Condor*. 14:53-63.
- Willett, G. 1933. Revised list of the birds of southwestern California. *Pacific Coast Avifauna* 21:1-204.
- Williams III, S. O. 1997. Summary of the Willow Flycatcher Surveys Conducted in New Mexico: 1994-1996, New Mexico Department of Game and Fish. 6 pp.
- Wolf, N. J. Bixby, and R. Capranka. 1976. Prenatal experience avian development: brief simulation accelerates the hatching of Japanese quail. *Science* 194:959-960.



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Sacramento Fish and Wildlife Office  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

In Reply Refer To:  
1-1-05-F-0067

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MAR 04 2005

MAR 03 2005

Mark C. Charlton  
Chief, Planning Division  
U.S. Army Engineer District, Sacramento  
Corps of Engineers  
1325 J Street  
Sacramento, California 95814-2922

Subject: Re-initiation of Formal Consultation on the Conservation Plan for the Long-Term Operation of Isabella Dam and Reservoir, Kern County, California

Dear Mr. Charlton:

This is in response to your February 11, 2005 letter, received February 11, 2005, requesting the U.S. Fish and Wildlife Service's (Service) concurrence that your conservation plan proposal to secure, restore, and manage 1,150 acres of habitat upstream of the Isabella Dam and Reservoir to benefit the endangered southwestern willow flycatcher (*Empidonax trailii extimus*) (flycatcher), its proposed critical habitat, and the endangered least Bell's vireo (*Vireo bellii pulchellus*) (vireo), is in accordance with the Service's 1996, 1997, and 2000 biological opinions (BO) and the 1997 Interagency Strategy Agreement regarding routine and long-term operations and management of Isabella Dam and Reservoir. This document amends the June 14, 2000 BO (Service file 1-1-99-F-216). This letter is issued under the authority of the Endangered Species Act of 1973, as amended (16 USC 1531 *et seq.*) (Act).

Specifically, the U.S. Army Corps of Engineers (Corps) is requesting concurrence with its proposal to fulfill certain unfulfilled non-discretionary reasonable and prudent measures and associated terms and conditions specified in the Service's biological opinions, 1996 BO, 1997 BO, and 2000 BO as follows:

- a. The Corps' purchase of 80 acres on the Allen Ranch fulfilled the commitment to protect an additional 50 acres of flycatcher habitat pursuant to the 1996 BO.
- b. The Corps' purchase of Sprague Ranch as detailed in this Conservation Plan serves to fulfill a portion of the commitment to protect 1,100 acres of flycatcher habitat pursuant to the 1997 BO and 2000 BO by providing protection of 975 acres of suitable flycatcher habitat.

TAKE PRIDE  
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- c. As detailed in the Conservation Plan, the proposed purchase of conservation easements as part of the Landowner Initiative, or alternatively the Corps authorizing the use of the National Fish and Wildlife Foundation (NFWF) endowment to fund habitat restoration, operation, and maintenance on State of California Department of Fish and Game property in the South Fork Kern River Valley area (SFWA), or purchase of additional flycatcher habitat in the region, will each serve to fulfill the remaining portion of the commitment to protect 1,100 acres of flycatcher habitat pursuant to the 1997 BO and 2000 BO by providing protection of 125 acres of flycatcher habitat.
- d. In consideration of current conditions and actions, the Service has concluded that the Corps can proceed immediately with unrestricted routine operation of Isabella Dam and Reservoir consistent with its October 1999 Revised Project Description, that includes reservoir storage above 2,584 feet in elevation (including March 1 through September 30) to the maximum reservoir storage capacity of 568,100 acre-feet and above, during the 5-year interim period.
- e. The Corps will as part of this Conservation Plan endow and continue to complete all specified monitoring, trapping, and study activities required in the Service's BO's that have not otherwise been implemented and completed.
- f. The exemption in Section 7(o)(2) of the Federal ESA applies with regard to a taking that may result from routine operation of Isabella Dam and Reservoir during the 5-year interim period.
- g. The Service's approval of this Conservation Plan concludes formal consultation on routine operation of Isabella Dam and Reservoir for the 5-year interim period except that the Re-initiation-Closing Statement included in the 2000 BO will continue to apply.

The findings and recommendations in this consultation are based on: (1) the Service's May 16, 1996 (1-1-96-F-27), April 18, 1997 (1-1-96-F-150), and June 14, 2000 (1-1-99-F-216) biological opinions on the Long-Term Operation of the Isabella Dam and Reservoir; (2) the Interagency Strategy Agreement dated February 4, 1997, regarding the routine and long-term operations and management of Isabella Dam and Reservoir in Kern County, California; (3) the Service's December 6, 2000 (1-1-01-I-453) and January 18, 2001 (1-1-01-I-786) letters regarding the Allen property acquisition; (4) the proposed February 2005 *Conservation Plan to Protect Habitat for the Southwestern Willow Flycatcher and Least Bell's Vireo in the South Fork Kern River Valley, Kern County, California* (Conservation Plan), prepared by your office; and (5) other sources of information available to the Service.

*Proposal a.*

In the Service's letters dated December 6, 2000 and January 18, 2001 we agreed that the Allen property was a suitable acquisition that will provide protection of flycatcher habitat. We also agreed that the conservation easement contained acceptable language to provide protection of the property. On May 26, 2001, the Trustee of the Allen Ranch accepted an offer made by Audubon California (on behalf of NFWF). Escrow closed on December 26, 2001. This letter confirms our concurrence that the purchase of Allen Ranch fulfills 50 acres of the Corps' commitment to protect flycatcher habitat.

*Proposal b.*

The 2,489-acre Sprague Ranch is one of the largest remaining unprotected properties on the 14-mile riparian corridor from the Wilderness Boundary to Isabella Lake. The Sprague Ranch is located immediately adjacent to and north of the Audubon California Kern River Preserve (KRP), sharing a common border of over 3 miles. The KRP includes some of the best habitat for flycatcher in the Kern River Valley. This area has been recognized as a Globally Important Bird Area, supporting 30 percent of California's flycatcher breeding population as well as significant populations of yellow-billed cuckoo, southwestern pond turtle, alkali Mariposa lily, and other riparian obligate species.

The Sprague Ranch has historic water rights to the Cottonwood Ditch. This ditch may be managed to improve habitat on new restoration areas as well as to maintain existing habitat at the KRP. The Sprague property includes a mix of habitat types including riparian forest, native pasture, seasonal wetlands, cultivated agriculture, and upland scrub. Two habitat assessments have been performed on the riparian forest, grassland/riparian, riparian/wetland/meadow, and flood plain scrub components of the property: the January 2000 *Sprague Ranch Habitat Restoration Potential* prepared by Reed Tollefson, Manager, Audubon California's Kern River Preserve, and the June 4, 2000 *Results of Assessment of Southwestern Willow Flycatcher Habitats on the Sprague Ranch, Kern County, California*, prepared by Jones & Stokes, Sacramento, California. The results of both assessments found 414 acres available as potential flycatcher breeding habitat through restoration and management. Another 561 acres were identified as not being suitable for wetland development, but potentially restorable to support a mosaic of habitat that could be used by flycatchers during post breeding dispersal and migration.

Because of the strategic location of the Sprague Ranch to the KRP and the large amount of flood plain (historical flycatcher habitat) available through this acquisition, this property has a critical effect on the hydrology that supports the riparian resources within the KRP as well as the SFWA. Protection of the Sprague Ranch property would increase the availability of flycatcher breeding and post-breeding habitat through successful restoration, provide an extensive buffer area for the KRP, and secure historic water rights for restoration as well as maintenance of existing habitat.

NFWF has drafted a 2-year contractual agreement with Audubon California (AC) to implement habitat restoration and management measures on both NFWF and WCB Phase I acquired acres of the Sprague Ranch. This contract is scheduled to commence in April 2005 with a completion

date in 2007. The local chapter of AC has extensive experience planning, designing, and implementing restoration and management of the riparian forest along the South Fork Kern River. The restoration effort will focus on those portions of the Sprague Ranch where the hydrological and other physical attributes may provide a mix, or mosaic, of habitat types required by the flycatcher to live and successfully reproduce.

The Service concurs that by using historic water rights, modifying or eliminating current grazing practices, removing invasive nonnative plant species, and actively planting native riparian vegetation, the Sprague property has the potential for restoration of approximately 975 acres into a mosaic habitat similar to the KRP and SFWA. This acquisition and restoration will fulfill 975 acres of the 1,150 acre commitment to protect flycatcher habitat.

*Proposal c.*

As discussed in the proposed Conservation Plan, the Service concurs with the Corps that there are several potential opportunities to fulfill the remaining 125-acre commitment. The Service recommends that, during the 5-year interim period, the Corps and the Service explore potential options in addition to habitat acquisition and/or restoration, in order to fulfill the remaining 125-acre commitment for the protection of the flycatcher. These options may include securing conservation easements that are accompanied by secured water rights in order to ensure the availability of water to suitable flycatcher habitat in perpetuity. The Corps is required to submit annual reports by December 15 of each year, during the 5-year interim period, to document the current status of the Sprague Ranch restoration. The annual report will also describe the status of efforts to address the remaining commitments under the BOs. Based on the report, further evaluation and coordination may be required.

*Proposals d, e, f, and g.*

The Service concurs that, with the acquisition and restoration of 975 acres on the Sprague Ranch, the prior acquisition of 50 acres of suitable habitat on the Allen Ranch; the commitment to fulfill the remaining 125-acre commitment; the commitment to endow and continue all specified monitoring, trapping, and study activities required in the Service's BO's that have not otherwise been implemented and completed; and the commitment to the 2000 BO re-initiation requirement; the Service is authorizing the incidental take of flycatcher associated with unrestricted routine operation of Isabella Dam and Reservoir during the 5-year interim period. These are the same routine operations as described in the Corps' 1999 Biological Assessment which were analyzed for the 1 year interim period in our June 14, 2000 BO and will apply to the new 5-year interim period and include reservoir storage above 2,584 feet in elevation (including March 1 through September 30) to the maximum reservoir storage capacity of 568,100 acre-feet and above during the 5-year interim period.

Also, as described in the 2000 BO, the Corps, in consultation with the Watermaster, will use the early March forecast of Isabella Reservoir operations (based on the forecasts of the National Weather Service, the California Department of Water Resources, and the Kern River Watermaster, as well as any additional information available to the Corps) and a 50 percent

exceedance probability to determine if the water year will result in the highlighted value in Table 1 being reached. In the extremely unlikely event the triggering value in Table 1 is reached (i.e., a seventh year out of ten at or above 2,600 feet during the March to September growing season), the Corps has stated they will reinitiate formal section 7 consultation with the Service. This measure will continue to apply during the 5-year interim period.

As the Corps continues to implement the preceding commitments, incidental take associated with the proposed Long-Term Operation of Isabella Dam and Reservoir will remain the same as the June 14, 2000 BO and the exemption in section 7(o)(2) applies.

Please contact Roberta Gerson or Catrina Martin of this office at (916) 414-6600 if you have any questions regarding the project.

Sincerely,



 Cay C. Goude  
Acting Field Supervisor

cc:

ARD (ES), Portland, OR

Paul Henson, Assistant Manager, ES, CNO

Field Supervisor, FWS-PFO, Phoenix, AZ

Steve Anderson, Sequoia National Forest, Porterville, CA

Scott Kuney, Law Offices of Young Wooldridge, Bakersfield, CA

Bruce Hafefeld, Weldon, CA

Dave Prince, Bakersfield, CA



DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO  
ATTENTION OF

FEB 11 2005

Environmental Resources Branch

Mr. Wayne White, Field Supervisor  
U.S. Fish and Wildlife Service  
2800 Cottage Way, Room W-2605  
Sacramento, California 95825-1846

Dear Mr. White:

This letter requests your concurrence with our proposal to secure, restore, and manage 1,100 acres of habitat upstream of Isabella Dam and Reservoir to benefit the Federally listed southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher), its proposed critical habitat, and the least Bell's vireo (*Vireo bellii pusillus*) (vireo). This protection effort is in accordance with the U.S. Army Corps of Engineers' (Corps) August 14, 1996, and October 1999 project descriptions; the U.S. Fish and Wildlife Service's (Service) May 16, 1996 (1-1-96-F-27), April 18, 1997 (1-1-96-150), and June 14, 2000 (1-1-99-F-216), biological opinions (BO's); and our Interagency Strategy Agreement dated February 4, 1997, regarding the routine and long-term operations and management of Isabella Dam and Reservoir in Kern County, California.

The enclosed report outlines our proposal to implement the habitat protection requirements of the Service's BO's and resume unrestricted routine operations of Isabella Dam and Reservoir. The Corps proposes to protect a majority of the required habitat through the fee-sale acquisition of 2,489 acres with restoration, operation, and maintenance on approximately 975 acres of flood plain on the Sprague Ranch. The Corps will fulfill the remaining portion of the habitat protection commitment within an interim period of 5 years with implementation of additional protection measures described in the Conservation Plan. We are confident that implementation of the Conservation Plan will yield significant benefits for the flycatcher, vireo, and other riparian obligate species such as the yellow-billed cuckoo (*Coccyzus americanus*), as well as to the suitability and quality of the habitat that they depend on.

We will be able to continue our efforts towards property acquisition and perpetual protection of habitat as soon as written concurrence is received from your agency. We appreciate the cooperation provided by Ms. Catrina Martin of your staff in assisting us to achieve a balance among our commitments. If you have any questions, contact Mr. Mitch Stewart, Isabella Team Environmental Manager, at (916) 557-6734.

Sincerely,

Mark C. Charlton  
Chief, Planning Division

Enclosure

Copy Furnished w/enclosure:

Ms. Catrina Martin, U.S. Fish and Wildlife Service, 2800 Cottage Way, W-2605, Sacramento, CA 95825-1846

Mr. Steve Anderson, Sequoia National Forest, USDA Forest Service, 900 West Grand Avenue, Porterville, CA 93257-1500

Mr. Scott Kuney, Law Offices of Young Wooldridge, 1800 30<sup>th</sup> Street, 4<sup>th</sup> Floor, Bakersfield, CA 93301