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AESO/SE
2-21-01-F-148

December 26, 2001

Mr. Terry Oda
Environmental Protection Agency
Clean Water Act Standards and Permits Office
75 Hawthorne Street
San Francisco, California 94105-3901

Dear Mr. Oda:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on the June 18, 2001, receipt of your June 12, 2001, letter requesting initiation of formal section 7 consultation under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The consultation concerns the possible effects of a master planned community titled "The Homestead at Camp Verde" on the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*).

In our 30-day acknowledgment letter we provided a concurrence for your determination of "may affect, not likely to adversely affect" for bald eagle (*Haliaeetus leucocephalus*). On October 1, 2001, we received your September 12, 2001, (WTR-5) update to the biological assessment for The Homestead at Camp Verde. In this update you provided "may effect, not likely to adversely effect" determinations for possible effects of this action on the federally endangered razorback sucker (*Xyrauchen texanus*); threatened spikedace (*Meda fulgida*) and loach minnow (*Tiaroga cobitis*); and designated critical habitat for these three fishes. We sent a letter to the EPA on October 24, 2001, indicating that we were unable to concur with those determinations. On November 26, 2001, we received your letter requesting formal consultation for the razorback sucker, spikedace, loach minnow, and their critical habitat.

Since our November 26, 2001 letter, Harvard Investments, in their December 10, 2001 letter, proposed additional Conservation Measures in order to protect threatened and endangered fish and designated critical habitat in the Project Area. These include measures to develop a recreation and habitat monitoring plan, monitor effects of recreation on habitat, and implement management measures to ensure that habitat and streambanks are not degraded. The risk of the introduction of exotic aquatic species will be reduced by implementing educational programs, prohibiting backyard ponds, and prohibiting fishing and in-stream recreation in the Verde River

Conservation Area. Harvard has also committed to improve the barriers that restrict access to the river area and limit trespass, and increase the amount of fence maintenance. Therefore, due to the additional Conservation Measures proposed by Harvard included in the Project Description, we concur with a “may affect, not likely to adversely effect” determination for spikedace, loach minnow, razorback sucker, and designated critical habitat for all three species.

The following biological opinion for the southwestern willow flycatcher is based on the information provided in the biological assessment (BA) prepared by SWCA (2001), data in our files, various field trips, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern or other subjects considered in this opinion. A complete administrative record of this consultation is on file in this office.

BIOLOGICAL OPINION

Consultation History

April 2000 to December 2000 - The Service, Harvard Investments, U.S. Forest Service (USFS), Bureau of Reclamation, The Nature Conservancy, Arizona Department of Transportation, and Town of Camp Verde engaged in informal meetings and field trips in order to seek funding for greater management and land conservation in the project area for the southwestern willow flycatcher. However, the effort was unsuccessful due to issues surrounding funding, and title and ownership of the floodplain.

January 2001 - The Service provided comments to the draft Biological Assessment prepared by SWCA, Inc.

June 18, 2001 - The EPA initiated formal consultation for southwestern willow flycatcher and provided a not likely to adversely affect determination for bald eagle. The EPA also provided no effect determinations for spikedace, loach minnow, razorback sucker.

July 13, 2001 - The Service wrote a 30-day acknowledgment letter and concurred with the EPA’s determination that the project may affect, but is not likely to adversely affect the bald eagle. The Service provided the EPA more information about the presence of spikedace, loach minnow, and razorback sucker critical habitat in the action area, and the presence of razorback sucker and spikedace in the Verde River in the action area. The Service requested a jeopardy or non-jeopardy determination for non-essential experimental populations of reintroduced Colorado pikeminnow.

October 1, 2001 - The Service received the EPA’s September 12, 2001 letter providing an update of Harvard Investment’s biological assessment. The EPA provided a determination of non-jeopardy for non-experimental population of Colorado pikeminnow, and a may affect, not likely

to adversely affect determinations for spikedace, loach minnow, and razorback sucker critical habitat.

October 23, 2001 - The Service received a letter from Harvard Investments clarifying portions of the project description and providing additional Conservation Measures.

October 24, 2001 - The Service provided a non-concurrence letter to the EPA on spikedace, loach minnow, razorback sucker critical habitat, and informed the EPA that due to the presence of razorback sucker and spikedace in the action area, consultation could not be solely on critical habitat, but also these species. The Service indicated that if the EPA initiates consultation on fish, it will be completed in a separate opinion. The Service also requested a 30-day extension to allow for completion and review of the draft opinion.

November 26, 2001 - The Service received a letter from EPA granting an extension to the completion of the biological opinion to November 30, 2001 and that Harvard Investments agreed to the extension. The EPA also requested formal consultation on spikedace, loach minnow, razorback sucker, and critical habitat for all three fish species.

November 29, 2001 - The Service sent an electronic version and a hard copy of the draft opinion for the southwestern willow flycatcher to the EPA. Included in the hard copy were figures and maps not sent electronically. The Service decided to include formal consultation on spikedace, loach minnow, razorback sucker, and their critical habitat into the final biological opinion. The Service requested an additional 30-day extension to December 30, 2001, with a final opinion delivered 10 days after comments are received from the EPA.

December 10, 2001 - The Service received a letter dated December 3, 2001 from the EPA acknowledging receipt of the draft opinion and reiterating that they desired to have spikedace, loach minnow, and razorback sucker included in the final biological opinion.

December 10, 2001 - The Service received a letter from Harvard Investments providing additional Conservation Measures to protect threatened and endangered fish and their critical habitat, and clarifying other proposed Conservation Measures.

Project Description

The proposed project is the issuance of a National Pollutant Discharge Elimination System permit pursuant to 402 of the Clean Water Act for the "Homestead" (a master planned community developed by Harvard Investments in Camp Verde, Arizona). This development is composed of two parcels totaling 388 acres of currently undeveloped land (Figures 1 and 2). The larger of the two parcels, consisting of 363 acres along Highway 260, is proposed for residential (800 single-family residential units [included clustered housing] and 300 apartment units) and commercial development. An adjacent 25-acre parcel within the 100-year floodplain set aside for southwestern willow flycatcher conservation and a 33-acre buffer just above the 100-year floodplain are not proposed for development. Approximately 2000 people will reside at the

Homestead. In addition, daily visitors will visit the site for commercial or other purposes. The Homestead is located in the Town of Camp Verde, Yavapai County, Arizona, Township 14 N, Range 4 East, Northeast 1/4 Section 36, Northwest 1/4 Section 31, and Southeast 1/4 Section 25.

Specific land use descriptions are as follows:

- 130.42 acres are slated to be developed as single family home sites.
- 25.62 acres are slated for clustered housing.
- 16.57 acres are slated for apartments.
- 10.0 acres are slated for a school site.
- 4.1 acres are slated for a possible church site.
- 56.68 acres are slated for other commercial development.
- 127.18 acres are slated to be open space, parks, and/or conservation areas.
- 16.08 acres are slated for right-of-way.

Complete development of the project is expected to occur within 10 years. The project is planned to proceed in phases with 100 lots developed in each phase. However, the land use plan-concept describes 165 lots developed in Phase 1 (SWCA 2001). Phase 1 is expected to take 1 to 2 years. Harvard Investments is not certain on the timing of how the remaining 561 lots, apartments, commercial buildings, church, and school will be developed, other than it will be done in an undetermined number of phases.

The source of water for the development is located in Camp Verde. Water will be provided by the Camp Verde Water System, a private supplier. Water needs have been estimated at 436 acre feet per year (260 gallons per minute). Water will be produced from groundwater from two wells five miles upstream of the development and about 1.3 to 1.5 miles from the Verde River. Wells are drilled down to an aquifer below the upper alluvium 500 to 563 feet in depth. Existing wells on the property will be retired.

A 25-acre parcel of floodplain and flood-prone habitat and 33-acre buffer habitat north of the canal will be donated by Harvard to the Homeowners Association (HOA) of The Homestead as preserve for the southwestern willow flycatcher, critical habitat for threatened and endangered native fish, and the overall aquatic and riparian resources of the Verde River. The HOA will be responsible for management of the 25-acre preserve and adjacent buffer area. Costs of management will be established from a fund established by Harvard Investments (\$20,000) and augmented through homeowners fees for 20 years. Only residents of the Homestead and out-of-

town visitors or guests of residents may use the Conservation Area. This will be accomplished by dedicating the Conservation Area and the adjacent buffer habitat north of the canal to the HOA with appropriate Conservation Easements upon them.

Management of the 25-acre parcel and 33-acre adjacent buffer area will be the responsibility of the HOA and involve seven general tasks: fence construction and maintenance, property inspection, removal of trash and debris and minor habitat restoration, education, monitoring, adaptive management to gain desired riparian/streambank conditions, and reporting. A fence will surround the 25-acre parcel along with a fenced trail leading to the river. The fence will be designed to control reasonable access to Conservation Area, the adjacent Forest Service property, and to reduce trespass. At the entrance will be a gate, which will be locked annually during the flycatcher breeding season (April 15 to September 15) and from sundown to sunrise during the open season (September 16 to April 14). Signs will be posted throughout the area and education programs implemented. Property inspection will occur to identify maintenance needs, inspect and repair fences, conduct minor maintenance activities, and remove trash. Monitoring of habitat conditions (riparian, streambank, channel), recreational, and trespass, and adaptive management will occur to ensure that human recreation is not degrading streambanks or impeding the development of riparian habitat to its natural capacity. An annual monitoring report will be provided to the Service summarizing the work completed each year and activities planned for the following year with a summary report presented to the Service every three years for evaluation.

Harvard Investments has clarified and offered to implement the following Conservation Measures as part of the proposed project for the protection of the southwestern willow flycatcher, spikedace, loach minnow, razorback sucker, and critical habitat for the three fish species. The following measures are intended to protect critical habitat (stream, streambanks); riparian habitat critical to maintaining and protecting the integrity of critical habitat; and threatened and endangered fish from the possible effects of The Homestead. It is also expected that these measures will maintain, improve, and enhance conditions for the endangered southwestern willow flycatcher and all riparian/aquatic species. The effects of recreation on streambanks, aquatic habitat, in-stream habitat, sediment loads, riparian habitat, birds, and fish can be reduced by managing/controlling the intensity, location, and type of recreation.

Land management within The Homestead development will be constrained by CC&Rs (Covenants, Conditions, and Restrictions) designed to reduce and minimize potential adverse effects of The Homestead Project on wildlife, specifically the endangered southwestern willow flycatcher and razorback sucker, threatened spikedace and loach minnow, and designated critical habitat for spikedace, loach minnow, and razorback sucker. The CC&Rs will be enforced by the HOA. The following is a summary of the Conservation Measures proposed by Harvard Investments (all references to Harvard include Harvard and its successors, such as the Homestead at Camp Verde Homeowners Association):

1. The 25-acre Conservation Area shall have only a single point of entrance, will have a lockable gate, will not allow motorized vehicles or bicycles to enter the area, and will be designed to only allow access to pedestrians.
2. The Conservation Areas are only intended for the use of the residents of The Homestead or their guests.
3. Access through the Conservation Area will be restricted to a single, fenced, non-vehicular trail.
4. The fence and gate at the Conservation Area (Figure 2) will be made of materials that will restrict access and not be harmful to other wildlife. The fence and gate will be designed and placed so as to eliminate reasonable access to the Conservation Area and National Forest parcel. Typical barbed wire or split rail fence are not be appropriate due to the ease in which people can vandalize them and/or travel through, under, or over them. These fence types only provide an obstacle, not a reasonable barrier to prevent access associated with a large residential area.
5. The gate to the Conservation Area will be locked from sundown to sunrise during the open season, September 15 to April 15.
6. The gate will be locked and the Conservation Area will be closed to all public access from April 15 to September 15.
7. Fencing surrounding the Conservation Area will be inspected and repaired every two weeks from April 15 to September 15 (11 visits) and monthly from October 1 to April 1 (7 visits). Trash collection in the Conservation Area will follow this same schedule. Signs of trespass and other basic maintenance duties (described in the Biological Assessment) will be conducted as needed during these visits. Property inspection will occur twice a year to identify maintenance needs along with photo documentation from fixed points.
8. In order to establish some riparian habitat, no recreational access will be allowed in the Conservation Area until January 1, 2005.
9. Harvard will develop a Recreation and Habitat Monitoring Plan and establish an environmental baseline of the Conservation Area prior to January 1, 2005. Harvard and the Service will mutually agree upon a reasonable and effective plan that accomplishes the goal of the Conservation Area described in number 11.
10. As part of the Recreation and Habitat Monitoring Plan, Harvard will develop a reporting and response program for trespass activities. Contact will be established with all neighboring landowners between the I-17 Verde River and Beaver Creek Bridges to establish a place/person of contact and reporting system to document trespass activities from residents of

the Homestead and/or recreational activity from the Conservation Area. Harvard will develop, with the neighboring landowners, mutually cooperative ways to minimize trespass through any practical means. This could include sharing costs for fencing, signs, etc.

11. The Recreation and Habitat Monitoring Plan will be designed in order to monitor the effects and types of human activity in the Conservation Area and whether the aquatic and riparian habitat are being altered from, or impeded from reaching its natural capacity. The goal for the Conservation Area is for riparian habitat and ground cover to develop, be maintained, and regenerate to its natural capacity; to improve and maintain streambanks; to reduce erosion and sediment loads to the river; and to maintain good water quality. Due to the dynamic nature of riparian habitat, the natural effects of flooding will cause the quality of habitat to fluctuate. Therefore, it is important to understand that the process of developing, maintaining, and regenerating habitat is one that will be repeated over the life of the project.

The plan will include, but not be limited to semi-annual inspections by a qualified biologist, photo points, scientifically acceptable vegetation, channel, and streambank assessments, recreation monitoring, surveys of persons knowledgeable of the human activities in the area. Data will be summarized and evaluated annually and submitted to the Service. The information will be evaluated by the Service and other appropriate agencies every three years.

If it is discovered, following evaluation, that recreation is impeding the establishment, maintenance, and regeneration of riparian habitat, and/or streambanks are being degraded, then measures will be implemented to reduce trespass or otherwise limit the number of daily visitors and/or types of activities in the Conservation Area.

12. Harvard will conduct annual southwestern willow flycatcher surveys and nest monitoring according to the most recent (2001) survey and nest monitoring protocols for the life of the project beginning in 2005, including documentation of cowbird parasitism in suitable habitat along the Verde River from I-17 to the Beaver Creek Bridge, provided that permission can be obtained from neighboring landowners. These survey and monitoring protocols are currently found in Sogge *et al.* (1997), USFWS (2000), and Rourke *et al.* (1999), however updated survey protocols may be adopted. Harvard reserves the right to adopt or reject changes in protocols, depending on available funding. Annual surveys and nest monitoring will require appropriate southwestern willow flycatcher training and permits. Survey and monitoring may be suspended during the first three years of a five year cowbird trapping cycle, but resumed for the last two years (years 4 and 5). Monitoring shall be terminated if the southwestern willow flycatcher is taken off the threatened and endangered species list. After a 30 year period (approximately 2033), the Service and HOA will review the monitoring program and status of the species to determine if additional monitoring is required.
13. Harvard will institute a cowbird trapping program for the life of the project. Cowbird trapping will commence in 2002 for five years. At the end of five years, Harvard will review the effectiveness of the trapping with the Service, AGFD, USFS, and other appropriate

parties. Following the first five years of trapping, Harvard will re-initiate cowbird trapping if in any one year parasitism reaches 30 percent of all nesting birds evaluated in the project area (I-17 bridge to Beaver Creek Bridge), or if parasitism averages 20 percent or more in two or more successive years. Once the trigger for trapping occurs, Harvard shall continue trapping for five years and then re-evaluate again with the Service, Arizona Game and Fish Department (AGFD), and USFS. The cowbird trapping program shall be designed in cooperation with the Service, AGFD, USFS, and other appropriate parties. Surveys and nest monitoring may be suspended for the first three years of the five year trapping cycle. Survey and monitoring will occur in years 4 and 5 of the trapping cycle and serve as a basis for evaluating the trapping program and the need to continue. The trapping program may be discontinued at any time with the consent of the Service.

14. Harvard will coordinate with the Service, USFS Camp Verde Ranger District, and local fire department and develop a response and action plan to minimize the risk and effect of fire on riparian habitat. Eliminating habitat in the Conservation Area will not be a valid method to reduce fire risk. Smoking and campfires will be prohibited in the Conservation Area. Signs and educational programs will clearly describe and explain the need for fire restrictions. The plan shall be agreed upon by the Service and in place before January 1, 2005, before the Conservation Area is opened for use.
15. Should a fire occur as a result of the development or human activity associated with the Conservation Area, Harvard will consult the appropriate agencies (NRCS, USFS, etc.) to encourage and accelerate restoration of riparian habitat through pole planting, extended closures to re-establish habitat, hydroseeding, or similar measures.
16. Harvard will post all educational and no trespass signs around the Conservation Area prior to residents moving to the area. Post perimeter "no trespass" signs, no smaller in size than 2 feet by 2 feet in size, no more than 150 feet apart from each other. Ensure that lettering will be large enough to occupy the entire sign and legible from 25 feet away. Work with the Service, AGFD, and USFS to develop the language for the signs. Content of signs will vary depending on location. For example, signs at the entrance to the Conservation Area will be more descriptive, possibly including brochures on wildlife species and habitat, while boundary signs will likely be more direct with less language, and focus on trespass.
17. Harvard will develop and be responsible for the presentation of a southwestern willow flycatcher, threatened and endangered fish, and critical habitat educational program for the residents of the Homestead and other interested parties in Camp Verde annually until 2013 and every other year after that until 2033. The programs will emphasize; a) the importance of the Verde Valley, Verde River, and riparian habitat for the flycatcher, threatened and endangered fish, critical habitat, and other sensitive species; b) the importance of riparian habitat for native fish; c) the detrimental effects of exotic aquatic species (vertebrate and invertebrate) on native fish populations; d) the harm that exotic vegetation can cause aquatic and riparian systems, and aquatic and terrestrial species; and e) the commitment by Harvard

to reduce recreation uses in response to degradation or inappropriate use of the area. Harvard will work with Service, AGFD, and USFS on the content and accuracy of the material.

18. Harvard will deliver educational materials to the residents of the Homestead annually describing the closing and opening of the breeding area closure, fire restrictions, trespass, and other pertinent data on flycatcher success, riparian restoration, fish populations, etc. Harvard will work with the Service, AGFD, and USFS on the content and accuracy of the material. Educational materials will be developed and distributed annually to the residents, but will be terminated if the flycatcher, spikedace, loach minnow, and razorback sucker are removed from the list of threatened and endangered species. After a period of 30 years (approximately 2033), the Service and the HOA will review the educational program to determine if continued education is required.
19. To reduce proliferation of exotic aquatic species that may affect threatened and endangered fish species, Harvard will ensure that outdoor residential ponds are prohibited within The Homestead. If community ponds within the Homestead are developed, any plants or aquatic species established in the ponds, must be native to the Gila Basin. If community ponds within the Homestead are established, they must be checked every 4 months and any non-native aquatic (vertebrate, invertebrate [crayfish, clams, etc.] or plant species) species be removed during those inspections.
20. A three-foot high, ranch style fence will be placed along the Verde Ditch, subject to approval, to prevent people from falling into or jumping across the ditch. "No swimming and fishing" signs will be posted.
21. To reduce the risk of causing harm to any threatened and endangered fish species in any form of their life cycle or the habitat in which they depend, no swimming or in-stream recreation in the Verde River in the vicinity of the Conservation Area or Verde Ditch will be allowed.
22. To reduce the risk of causing harm to any threatened and endangered fish through capture, or introduction of exotic species (used as bait), fishing will be prohibited in the Conservation Area and Verde Ditch and appropriate signs will be posted.
23. A 25-mile per hour speed limit will be established on all streets located within The Homestead Project between the Verde Ditch and the river.
24. A list of approved plants and a list of prohibited plants will be provided to homeowners. The CC&Rs will specifically prohibit the use of Bermuda grass and any hybrids thereof on the whole project. The detailed list of prohibited plants can be found in SWCA's (2001) biological assessment.
25. Grass lawns in front of each house will be limited to 20 percent of the front yard. An unlimited amount of grass lawn will be permitted behind each house, but all lawns must be composed of approved low-water-consumptive seed types.

26. Pets, particularly dogs and cats, must be confined to the homeowner's property or be leashed at all times. Perimeter fencing will be designed, as is practical, to preclude animal access to preserve areas. In parcel 7 (the only development parcel north of the canal and closest to the river), fencing will not restrict cats from entering the Conservation Area, therefore CC&Rs will contain an additional provision that will prohibit ownership of cats on parcel 7 (Figure 2). The name of this parcel may change in future mapping, but parcel 7 will always refer to the only development parcel north of the Verde Ditch.
27. Birdfeeders will be prohibited.
28. The only vehicle access to the preserve will be for fire or other emergency purposes and controlled with fences, gates and/or berms erected by Harvard. Vehicle access will not be used for convenience of simple tasks such as fence maintenance or trash pick-up.
29. Water wells on Harvard's property will be retired from use.

Status of the Species

Southwestern Willow Flycatcher

The southwestern willow flycatcher is a small grayish-green passerine bird (Family Tyrannidae) measuring approximately 5.75 inches. 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, and 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.

The southwestern willow flycatcher is one of four currently recognized willow flycatcher subspecies (Phillips 1948, Unitt 1987, Browning 1993). It 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 historic breeding range of the southwestern 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 southwestern willow flycatcher was listed as endangered, without critical habitat on February 27, 1995 (USFWS 1995). Critical habitat was later designated on July 22, 1997 (USFWS 1997a). A correction notice was published in the Federal Register on August 20, 1997 to clarify the lateral extent of the designation (USFWS 1997b).

On May 11, 2001, the 10th circuit court of appeals set aside designated critical habitat in those states under the 10th circuit's jurisdiction. The Service decided to set aside critical habitat

designated for the southwestern willow flycatcher in all other states (California, Arizona, and New Mexico) until it can re-assess the economic analysis.

Declining southwestern willow flycatcher 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 (Sogge *et al.* 1997, McCarthy *et al.* 1998). Habitat loss and degradation are caused by a variety of factors, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, dams, and livestock grazing. Fire is an increasing threat to willow flycatcher habitat (Paxton *et al.* 1996), especially in monotypic saltcedar vegetation (DeLoach 1991) and where water diversions and/or groundwater pumping desiccates riparian vegetation (Sogge *et al.* 1997). Willow flycatcher nests are parasitized by brown-headed cowbirds (*Molothrus ater*) which lay their eggs in the host's nest. Feeding sites for cowbirds are enhanced by the presence of livestock and range improvements such as waters and corrals; agriculture; urban areas; golf courses; bird feeders; and trash areas. When these feeding areas are in close proximity to flycatcher breeding habitat, especially coupled with habitat fragmentation, cowbird parasitism of flycatcher nests may increase (Hanna 1928, Mayfield 1977a,b, Tibbitts *et al.* 1994).

Habitat

The southwestern willow flycatcher breeds in dense riparian habitats from sea level in California to approximately 8000 feet in Arizona and southwestern Colorado. Historic egg/nest collections and species' descriptions throughout its range, describe the southwestern willow flycatcher's widespread use of willow (*Salix* spp.) for nesting (Phillips 1948, Phillips *et al.* 1964, Hubbard 1987, Unitt 1987, T. Huels *in litt.* 1993, San Diego Natural History Museum 1995). Currently, southwestern willow flycatchers primarily use Geyer willow, Goodding's willow, boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolio*) and live oak (*Quercus agrifolia*) for nesting. Tamarisk is an important component of the flycatchers's nesting and foraging habitat in Arizona. In 2000, 270 of the 303 known nests built were placed in a tamarisk tree (Paradzick *et al.* 2001). Other plant species less commonly used for nesting include: buttonbush (*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* spp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* spp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types can be described for the southwestern willow flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997).

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 among 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

Throughout its range the southwestern willow flycatcher arrives 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). Southwestern willow flycatchers typically lay three to four eggs per clutch (range = 2 to 5). Eggs are laid at one-day intervals and are incubated by the female for approximately 12 days (Bent 1960, Walkinshaw 1966, McCabe 1991). Young fledge approximately 12 to 13 days after hatching (King 1955, Harrison 1979). Typically one brood is raised per year, but birds have been documented raising two broods during one season and renesting after a 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). The entire breeding cycle, from egg laying to fledging, is approximately 28 days.

Southwestern willow flycatcher nests are fairly small (3.2 inches tall and 3.2 inches wide) and its placement in a shrub or tree is highly variable (2.0 to 59.1 feet off the ground). Nests are open cup structures, and are typically placed in the fork of a branch. Nests have been found against the trunk of a shrub or tree (in monotypic saltcedar and mixed native broadleaf/saltcedar habitats) and on limbs as far away from the trunk as 10.8 feet (Spencer *et al.* 1996). Flycatchers using predominantly native cottonwood/willow riparian habitats nest low to the ground (5.9 to 6.9 feet on average), whereas birds using mixed native/exotic and monotypic exotic riparian habitats nest higher (14.1 to 24.3 feet on average). Birds nesting in habitat dominated by box elder nest the highest (to almost 60 feet).

The southwestern willow flycatcher is an insectivore, foraging in dense shrub and tree vegetation along rivers, streams, and other wetlands. The bird typically perches on a branch and makes short direct flights, or sallies to capture flying insects. Drost *et al.* (1998) found that the major prey items of the southwestern willow flycatcher (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.

Brown-headed cowbird parasitism of southwestern willow flycatcher broods has been documented throughout its range (Brown 1988a,b, Whitfield 1990, Muiznieks *et al.* 1994, Whitfield 1994, Hull and Parker 1995, Maynard 1995, Sferra *et al.* 1995, Sogge 1995b). Where studied, high rates of cowbird parasitism have coincided with southwestern willow flycatcher population declines (Whitfield 1994, Sogge 1995a,c, Whitfield and Strong 1995) or, at a minimum, resulted in reduced or complete nesting failure at a site for a particular year (Muiznieks *et al.* 1994, Whitfield 1994, Maynard 1995, Sferra *et al.* 1995, Sogge 1995a,c, Whitfield and Strong 1995). Cowbird eggs hatch earlier than those of many passerine hosts, thus

giving cowbird nestlings a competitive advantage (Bent 1960, McGeen 1972, Mayfield 1977a,b, Brittingham and Temple 1983). Flycatchers can attempt to reneest, but it often results in reduced clutch sizes, delayed fledging, and reduced nest success (Whitfield 1994). Whitfield and Strong (1995) found that flycatcher nestlings fledged after July 20th had a significantly lower return rate and cowbird parasitism was often the cause of delayed fledging.

Territory size

Southwestern willow flycatcher territory size likely fluctuates with population density, habitat quality, and nesting stage. Estimated territory sizes are 0.59 to 3.21 acres for monogamous males and 2.72 to 5.68 acres for polygynous males at the Kern River (Whitfield and Enos 1996), 0.15 to 0.49 acres for birds in a 1.48 to 2.22 acre patch on the Colorado River (Sogge 1995c), and 0.49 to 1.24 acres in a 3.71 acre patch on the Verde River (Sogge 1995a). Territories are established within a larger patch of appropriate habitat sufficient to contain several nesting pairs of flycatchers. These birds appear to be semi-colonial nesters.

Rangewide Distribution and Abundance

Unitt (1987) documented the loss of more than 70 southwestern willow flycatcher breeding locations rangewide (peripheral and core drainages within its range) estimating the rangewide population at 500 to 1000 pairs. There are currently 182 known southwestern willow flycatcher breeding sites in California, Nevada, Arizona, Utah, New Mexico, and Colorado (all sites from 1993 to 1999 where a resident flycatcher has been detected) holding approximately 915 territories (Table 1). Sampling errors 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) and it is likely that the total breeding population of southwestern willow flycatchers fluctuates. Numbers have increased over the last few years, and some habitat remains unsurveyed; however, they are consistent with the 1987 estimate that 500 to 1000 pairs probably exist. About 50 percent of the 915 territories are currently found throughout the subspecies range are located at three locations (U-Bar Ranch - NM, Roosevelt Lake - AZ, San Pedro/Gila confluence - AZ).

Descriptions of flycatcher distribution can be difficult to understand due to the use of different terms. The territory is the most universal and least confusing term, due to it representing a singing male during the breeding season (Sogge *et al.* 1997). However, the words breeding "site," "location," or "group" are not necessarily defined the same throughout the bird's range. In Arizona, sites tend to represent a discreet patch of vegetation that contain flycatcher territories. Therefore, a "location" like the Gila/San Pedro confluence near Winkelman, Arizona, is comprised of many "sites." "Breeding groups" tend to describe a general geographic location where flycatcher territories exist, similar to a "location." Other states like New Mexico will define "sites" a little differently, and a larger "location" may be more synonymous with a "site."

Rangewide, the population is comprised of extremely small, widely-separated breeding groups including unmated individuals. For example, in Arizona, 57 percent (27/47) of the sites where flycatchers were found in 2000 (Paradzick *et al.* 2001) were comprised of five or fewer territories. In Arizona during the 2000 season, all but the "Salt River Inflow Site" at Roosevelt

Lake had 20 pairs or less (Paradzick *et al.* 2001). Rangewide, 81 percent of all sites from 1993 to 1999 had 5 or less flycatcher territories present at the site (Sogge *et al.* 2000).

The distribution of breeding groups is highly fragmented, often separated by considerable distance. In Arizona, about a 55 mile straight-line distance exists between breeding flycatchers at Roosevelt Lake, Gila County, and the next closest pairs on the San Pedro River, Pinal County or Verde River, Yavapai County.

The large distances between breeding groups and small size of those populations reduces meta-population stability and increases the risks of local extirpation due to stochastic events, predation, cowbird parasitism, and other factors. Willow flycatchers no longer occur at 40 of the 182 sites located and/or tracked rangewide since 1993 (USFWS 2001). All but two of these sites had less than 5 flycatcher territories present. The two exceptions (PZ Ranch on San Pedro River and Colorado River Delta at Lake Mead) were destroyed by fire and lake inundation, respectively; however, many more than 5 territories will be lost at Roosevelt Lake in the near future.

Because of the dynamic nature of the flycatcher's habitat, the survival and recovery of the flycatcher is not dependent on a few locations with large numbers, but properly distributed

Table 1. Rangewide population status for the southwestern willow flycatcher based on 1993 to 1999 survey data for Arizona, California, Colorado, New Mexico, Nevada, Utah, and Texas¹.

State	Number of sites with WIFL territories 1993-99 ²	Percentage of sites with WIFL territories 1993-99	Number of territories ³	Percentage of total territories
Arizona	81	45 %	297	33 %
California	52	29 %	183	20 %
Colorado	5	3 %	48	5 %
Nevada	10	6 %	44	5 %
New Mexico	28	15 %	321	35 %
Utah	6	3 %	22	2 %
Texas	?	?	?	?
Total	182	100 %	915	100 %

¹Sogge *et al.* 2000.

²Site boundaries are not defined uniformly throughout the bird's range.

³Total territory numbers recorded are based upon the most recent years survey information from that site between 1993 and 1999.

populations placed close together. The southwestern willow flycatcher is believed to function as a group of meta-populations (USFWS 2001). Esler (2000) describes Levins' meta-population theory as that which addresses the demography of distinct populations (specifically extinction probabilities), interactions among sub-populations (dispersal and recolonization), and ultimately persistence of the aggregate of sub-populations, or the meta-population. Meta-population theory has been applied increasingly to conservation problems, in particular those cases where species' ranges have been fragmented by habitat alteration by humans. An incidence function analysis completed for the southwestern willow flycatcher incorporated a spatial component to estimate probabilities of habitat patch extinction and colonization (Lamberson *et al.* 2000). Modeling indicated that persistence of flycatcher populations is reduced when populations are small and widely distributed. Conversely, meta-populations are more stable when sub-populations are large and close together. However, where populations exceed 25 pairs, it is best to colonize a new site, rather than risk the effects of catastrophic events (fire, disease, flood, etc.).

Unlike many other endangered bird species, the flycatcher's habitat is dynamic and can change rapidly: nesting willow habitat can grow out of suitability; saltcedar habitat can develop from seeds to suitability in five years; heavy runoff can remove all habitat in a day; or river channels, floodplain width, location, and vegetation density may change over time. Because of those changes, flycatcher "habitat" is often defined in three categories: potential, suitable, or occupied. This demonstrates that areas other than existing occupied locations can be considered flycatcher "habitat." The development of flycatcher habitat is a dynamic process involving, maintenance, recycling, and regeneration of habitat. Flycatcher habitat can quickly change and vary in suitability, location, and occupancy over time (Finch and Stoleson 2000).

Arizona Distribution and Abundance

As reported by Paradzick *et al.* (2001), the largest concentrations or general locations of willow flycatchers in Arizona in 2000 were near the confluence of the Gila and San Pedro rivers (219 flycatchers, 119 territories); at the inflows of Roosevelt Lake (207 flycatchers, 115 territories); Gila River, Safford area (30 flycatchers, 15 territories); Topock Marsh on the Lower Colorado River (25 flycatchers, 15 territories); Verde River at Camp Verde (9 flycatchers, 5 territories); Alpine/Greer on the San Francisco River/Little Colorado River (7 flycatchers, 5 territories); Alamo Lake on the Bill Williams River (includes lower Santa Maria and Big Sandy river sites) (44 flycatchers, 24 territories); Big Sandy River, Wikieup (23 flycatchers, 16 territories) and Lower Grand Canyon on the Colorado River (14 flycatchers, 8 territories). The greatest number of flycatchers are found at two general locations. Roosevelt Lake and the San Pedro/Gila confluence make up 234 (71%) of the 328 territories known in the state.

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 southwestern 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.

In 2000, 328 territories were known from 47 sites along 11 drainages in Arizona (Paradzick *et al.* 2001). The lowest elevation where territorial pairs were detected was 197 feet at Adobe Lake on the Lower Colorado River; the highest elevation was at the Greer Town site (8300 feet). The majority of breeding groups in Arizona were extremely small.

Only 68 (21%) of all known Arizona flycatcher territories in 2000 (52 Gila River, 15 on Lower Colorado River, 1 on Bill Williams River) were found below dams. Territories are primarily found on free-flowing streams or surrounding impoundments. At Roosevelt (n=115) and Alamo (n=24) reservoirs, 139 territories (42% of statewide total) described by Paradzick *et al.* (2001) are found within the lake area of influence.

Just after listing in 1996, 145 territories were known to exist in Arizona. In 2000, 328 territories were detected. However, the increase of 153 territories at Roosevelt and at San Pedro/Gila River confluence since 1995 represent almost 85 percent of statewide growth. Discovery as a result of survey effort was a large factor in detecting more birds at San Pedro/Gila confluence, but the Roosevelt population grew as a result of increased habitat development in the conservation pool of the reservoir.

While numbers have increased in Arizona and significantly at a few specific areas, distribution throughout the state has not changed much. Recovery and survival of the flycatcher depends not only on numbers of birds, but territories that are well distributed (USFWS 2001). As a result, the population stability in Arizona has been largely dependent on the presence of two large populations (Roosevelt Lake and San Pedro/Gila River confluence). Therefore, the result of catastrophic events or losses of significant populations either in size or location would greatly change the status and survival of the bird. Conversely, expansion into new habitats with increases in number of birds would also improve the stability and status of the flycatcher.

Some areas of Arizona have recently declined in known flycatcher abundance, specifically northern Arizona and the White Mountains in central/eastern Arizona. Populations in northern Arizona and the White Mountains have existed along the Colorado River in the Grand Canyon and upper Lake Mead, Little Colorado River, San Francisco River, and Verde River. The known populations at these sites declined from a high of 35 territories in 1996 to 19 territories in 2000 (Paradzick *et al.* 2001).

The loss of the breeding location at Roosevelt Lake, as a result of inundation of habitat, is expected, unless this habitat is lost due to other stochastic events, such as fire. The Bureau of Reclamation formally consulted with the Service on raising Roosevelt Dam (USFWS 1996b), and as a result of the project, all flycatcher habitat in that area may be lost. The consultation involved habitat that would be inundated around the perimeter of the lake due to raising the height of the dam. Since completion of that consultation, Roosevelt Lake has never filled, but dropped in water level due to drought conditions. As a result, more flycatcher habitat has developed in the conservation pool of the lake. The population at Roosevelt in 2001 grew to just over 140 pairs of flycatchers, about 40 percent of all known pairs in Arizona and about 15

percent of the rangewide total (T. McCarthy, AGFD pers com.). Evaluation of the status of the species is partially based upon the possible loss of these pairs as a result of habitat inundation.

Therefore, the status of the southwestern willow flycatcher in Arizona and throughout its range may significantly change in the near future. The drop in number of territories subsequent to inundation at Roosevelt would alter the movement, recruitment, and recovery of the bird and reduce numbers in Arizona nearer to where they were when the bird was listed in 1995. The result of these changes places a critical need for improved habitat development, security, management, and expansion in habitats elsewhere in Arizona and throughout the bird's range.

Fire

The evidence suggests that fire was not a primary disturbance factor in southwestern riparian areas near larger streams (USFWS 2001). Yet, in recent time, fire size and frequency has increased on the lower Colorado, Gila, Bill Williams, and Rio Grande rivers. The increase has been attributed to increasing dry, fine fuels and ignition sources. The spread of the highly flammable plant, tamarisk, and drying of river areas due to river flow regulation, water diversion, lowering of groundwater tables, and other land practices is largely responsible for these fuels. A catastrophic fire in June of 1996, destroyed approximately a half mile of occupied tamarisk flycatcher habitat on the San Pedro River in Pinal County. Over 95 percent of fires on the lower Colorado River are caused by recreation users (USFWS 2001). Brothers (1984) attributed increased fire along the Owens River in California to increased use of the riparian zones by campers and fishermen in the past 30 years. That fire resulted in the forced dispersal or loss of up to eight pairs of flycatchers (Paxton *et al.* 1996).

Mortality

There are not extensive records of adult southwestern willow flycatcher mortality. Incidents associated with nest failures, human disturbance, and nestlings are typically the most often recorded due to the static location of nestlings, eggs, and nests. As a result, nestling predation and brood parasitism are the most common causes of southwestern willow flycatcher mortality. Also, human destruction of nesting habitat through bulldozing, groundwater pumping, and aerial defoliant have been recorded in Arizona (T. McCarthy, AGFD, pers. com.). Human collision with nests and spilling the eggs or young onto the ground have been documented near high use recreational areas (USFWS 2001). A southwestern willow flycatcher from the Greer Town site along the Little Colorado River in eastern Arizona, was found dead after being hit by a vehicle along SR 373. This route is adjacent to the breeding site (T. McCarthy, AGFD, pers. com.).

Reproductive Success

In 2000, a total of 351 nesting attempts were documented in Arizona at 38 sites (Paradzick *et al.* 2001). The outcome from 227 nesting attempts from 12 sites was determined (not every nesting attempt was monitored). Of the 227 nests, 45 percent (n=103) of the nests were successful. Causes of nest failure (n=124) included predation (n=62), nest abandonment (n=40), brood parasitism (n=8), infertile clutches (n=7), weather (n=2), and unknown causes (n=8). Cowbirds may have contributed to other abandoned nests, but no direct evidence was detected. No parasitized nests fledged any willow flycatchers along with cowbird young. Eight of 12

monitoring sites had cowbird trapping in 2000. Two additional breeding sites (Bill Williams National Wildlife Refuge and Alamo Lake) had traps, but no nest monitoring occurred. The upper San Pedro River in BLM's conservation area had cowbird trapping, but no breeding flycatchers were known to be present.

Intensive nest monitoring efforts in California, Arizona, and New Mexico have shown that cowbird parasitism and/or predation can result in failure of the nest; reduced fecundity in subsequent nesting attempts; delayed fledging; and reduced survivorship of late-fledged young. 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, Whitfield 1994, C. Tomlinson 1995 *in litt.*, Griffith and Griffith 1995, Holmgren and Collins 1995, Kus 1995, Maynard 1995, McDonald *et al.* 1995, Sferra *et al.* 1995, Sogge 1995a, b, San Diego Natural History Museum 1995, Stransky 1995, Whitfield and Strong 1995, Griffith and Griffith 1996, Skaggs 1996, Spencer *et al.* 1996, Whitfield and Enos 1996, Sferra *et al.* 1997, McCarthy *et al.* 1998). The probability of a southwestern willow flycatcher successfully fledging its own young from a cowbird parasitized nest is low (i.e. <5%). Also, nest loss due to predation appears consistent from year to year and across sites, generally in the range of 30 to 50 percent. Documented predators of southwestern willow flycatcher nests identified to date include common king snake (*Lampropeltis getulus*), gopher snake (*Pituophis melanoleucos affinis*), and Cooper's hawk (*Accipiter cooperii*) (Paxton *et al.* 1997, McCarthy *et al.* 1998, Paradzick *et al.* 2000). These willow flycatcher predators were documented by video nest surveillance, as well as a yellow-breasted chat (*Icteria virens*) and Clark's spiny lizard (*Sceloporus clarkii*) on nearby conspecifics. These limited, but thorough observations of nests, demonstrate a wide variety of willow flycatcher nest predators. It is expected that other common predators of passerines, such as grackles, also eat flycatcher eggs and nestlings.

Cowbird trapping has been demonstrated to be an effective management strategy for increasing reproductive success for the southwestern willow flycatcher in certain areas as well as for other endangered passerines (e.g., least Bell's 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 may have 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.

Summary

Historically, the southwestern willow flycatcher declined in extent of range occupied and population size as a result of habitat loss, modification, and fragmentation. Known number of flycatcher pairs have increased throughout its range since the bird was listed in 1995, but still remain within the 500 to 1000 pairs estimated by Unitt (1987). Approximately half of all the known breeding pairs are found at three locations throughout the subspecies range (Cliff/Gila Valley, New Mexico, Roosevelt Lake and Gila/San Pedro river confluence, Arizona). Water diversions and return flows, flood control projects, development, livestock grazing, and changes

in annual flows due to off stream uses of water have affected the ability of the aquatic habitats to support native fish, plants, and wildlife. Riparian habitats by nature are dynamic, with their distribution in time and space governed mostly by flood events and flow patterns. Current conditions along southwestern rivers and streams are such that normal flow patterns have been greatly modified, catastrophic flood events occur with greater frequency as a result of degraded watershed conditions, stream channels are highly degraded, floodplains and riparian communities are reduced in extent, wildfires continue and the species composition of riparian communities are modified with exotic plant species. Habitat loss, fragmentation, and changes in plant species type leads to increased brood parasitism and nest predation. These conditions have significantly diminished the potential for southwestern rivers and streams to develop suitable habitat for the southwestern willow flycatcher and for those habitats to remain intact and productive for nesting flycatchers.

Environmental Baseline

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

The action area of the proposed project is a 27 mile stretch of the Verde River including its floodplain and riparian habitat from the Oak Creek/Verde River confluence downstream through the Town of Camp Verde to the Falls. However, any immediate effects of the action would likely occur in an approximate two mile-stretch of the Verde River from the I-17 bridge downstream to the Beaver Creek bridge. The action area is greater than the footprint of the project to address any indirect effects of groundwater pumping and recreation, and to account for the distance traveled by mobile brood parasites (Finch and Stoleson 2000) and other passerine predators as discussed in the Effects of Action.

Past Consultations

Since listing in 1995, at least 53 Federal agency actions have undergone (or are currently under) formal section 7 consultation throughout the flycatcher's range (Table 2). Six actions have resulted in jeopardy decisions. Many activities continue to adversely affect the distribution and extent of occupied and potential breeding habitat throughout its range (development, urbanization, grazing, recreation, native and non-native habitat removal, dam operations, river crossings, ground and surface water extraction, etc.). Stochastic events also continue to adversely affect the distribution and extent of occupied and potential breeding habitat.

Reasonable and Prudent Alternatives (RPA) accompanied a jeopardy opinion developed by the Service (1996a) for Phelps Dodge's Verde Valley Ranch development near Clarkdale. This development was adjacent to the only one to two pairs of flycatchers on the Verde River at that

time. The land has not yet been developed, but the flycatcher site (Tuzigoot Bridge) has been unoccupied by flycatchers since 1996 (Paradzick *et al.* 2001). One RPA directed Phelps Dodge (in cooperation State Parks, AGFD, and National Park Service) to manage a two-mile stretch of river at the Tuzigoot Bridge for the flycatcher (within the Verde Greenway). A management plan was completed by SWCA, Inc. (2000b). However, since the development has not begun, any on the ground management will occur when the development breaks ground. Phelps Dodge believes that development of this site could occur in 2003 (D. Meidinger, Phelps Dodge, pers. com.).

Anticipated or actual loss of occupied flycatcher habitat due to Federal or federally permitted projects (modification of Roosevelt Dam, operation of Hoover Dam, etc.) has resulted in biological opinions that led to acquisition of otherwise unprotected property specifically for the southwestern willow flycatcher. A small portion of the lower San Pedro River was acquired by the Bureau of Reclamation as a result of raising Roosevelt Dam and is now currently under the management of The Nature Conservancy. One pair of nesting flycatchers exists on this property (S. Sferra, U.S. Bureau of Reclamation, pers. com.). Commitments to acquire and rehabilitate (if needed) unprotected habitat have been made for loss of flycatcher habitat along the Lower Colorado River (Operations of Colorado River dams and 4.4 Plan/Change in Points of Diversion), Big Sandy River (Hwy 93 Bridge), Verde River (Mingus Ave. Bridge), Tonto Creek and Salt River (raising of Roosevelt Dam) in AZ and Lake Isabella, CA (operation of dams).

Much of the increase in the flycatcher's numbers in central Arizona and the subspecies range can be attributed to the rapid growth at Roosevelt Lake; however, much of that occupied habitat is expected to be lost in the future due to inundation. Reclamation consulted on the new area of inundation around the perimeter of Roosevelt Lake as a result of raising the dam (USFWS 1996). The Service's Biological Opinion provided to the Bureau of Reclamation authorizes the incidental take of 45 pairs (or 90 flycatchers) around the perimeter of Roosevelt Lake. However, an additional 95 territories (for a total of about 140 territories representing 15 % of all territories in the subspecies range and 40 % of all known territories in Arizona) were found at Roosevelt Lake by 2001. Nearly all are located in the center of the conservation pool surrounded by the area consulted on by Reclamation, but not addressed by that consultation. Thus, the first large storm runoff that enters Roosevelt Lake may inundate large areas of habitat used by breeding flycatchers.

The anticipated loss of the large amount of occupied breeding habitat at Roosevelt and future uncertainty of re-colonization at that site, would limit the remaining abundance and distribution of flycatcher territories in central Arizona (Gila, Maricopa, and Yavapai counties) to 5 along the Verde River and 1 along the Hassayampa River. This emphasizes the critical need in Arizona for the protection and expansion of territories at existing sites and the development of suitable habitat for birds to colonize. In central Arizona, streams with the best physical characteristics to develop abundant flycatcher habitat are along the Verde River and Tonto Creek (T. McCarthy, AGFD, pers. com.). The Salt River may have the potential to develop habitat in a few small locations, but it is largely regulated due to dams or has canyoned, high-gradient streams, lacking the physical characteristics to develop suitable habitat. The Hassayampa and Agua Fria rivers

and tributaries such as Sycamore, Red, West Clear, Pinto and other creeks provide the potential to develop smaller patches of suitable habitat.

Research and Monitoring

Because of the bird's low numbers, 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. Trapping, handling, banding, and determining the nest's status, and removing cowbird eggs may occasionally result in injury to or death of a bird. Specific training in standardized survey and monitoring procedures (Rourke *et al.* 1999, Sogge *et al.* 1997, USFWS 2000) are required throughout its range. Colored plastic bands led to injury of some flycatchers. This led the Service to alter its banding guidelines in 1998 and prompted researchers to use anodized-aluminum color bands. Reported injuries due to the new banding procedures have nearly been eliminated.

Verde River

The Verde River through the Verde Valley is characterized by a wide flood basin once dominated by Fremont cottonwoods with a dense understory. Although cottonwood stands and riparian vegetation still persist, they are now fragmented and dense understory is largely absent (Paxton *et al.* 1997). The quality and quantity of suitable aquatic and riparian habitat for threatened and endangered wildlife in the Verde Valley has been affected through numerous past actions resulting in reduction of riparian habitat, altered species composition, decreased surface water availability, changes in stream morphology, and other factors. A significant portion of the adverse impacts to the Verde River and its aquatic and riparian ecosystem come from the additive effect of small actions that individually may not threaten the system, but cumulatively result in continuing deterioration of the ecosystem.

Along the length of the Verde River, the Verde Valley provides the best location for development of flycatcher habitat due to its low gradient and wide floodplain. The Verde River is the third largest river in central Arizona, is unregulated for about 75 percent of its length, is a historical location for breeding flycatchers, and is centrally located in the state and the subspecies range. As a result, it is a significant location for both flycatcher survival and recovery. The Verde Valley is enhanced by the rich soils and water brought into the Verde River by Sycamore, Oak, Wet Beaver, and West Clear creeks. Further downstream below Bartlett Dam, the river running through the Fort McDowell Indian Community has similar physical characteristics, but due to the operation of Bartlett Dam, lacks the natural hydrologic regime required for habitat development, maintenance, and regeneration. Combined with operation of Bartlett Dam, other factors such as recreation, water diversion, development, and cattle grazing also limit habitat development and maintenance. In the action area, there is no management presently occurring to develop, maintain, and manage for flycatcher habitat.

Watershed, river and stream channel changes

The Verde River ecosystem has undergone major changes in the past 150 years, with the Verde Valley area being the most highly modified (excluding the construction and operation of

Horseshoe and Bartlett dams and lakes). The volume and pattern of flow in the river, particularly within the Verde Valley, has been modified by water diversion, groundwater pumping, and watershed alteration. The river channel has been modified by removal or use of riparian vegetation, flood control, construction of diversion dams, roads and bridges, gravel mining, and agricultural/suburban development in and adjacent to the floodplain.

Flooding is often considered the "natural" reason for the degraded condition of the Verde River and other streams in the Southwest. Although flooding may appear to be a disruptive force on stream channels, maintenance of the stream's dynamic equilibrium requires the full range of flows occurring in nature and "it is an important characteristic of a natural channel to accept both high and low flows with their associated sediment load without long-term changes in morphology" (Leopold 1997). Floods may rearrange materials within the channel and floodplain, but the channel returns to a state that is determined by geology, gradient, and sediment load, among other factors. The stream's dynamic equilibrium does not mean the stream channel always returns to exactly the same location. "The manner in which a channel moves across the valley floor, eroding one bank and building a nearly flat floodplain on the other, while maintaining a cross section approximately constant in shape and size, is an aspect of the dynamic equilibrium that characterizes many channel systems" (Leopold 1997).

Human disturbances of the watershed, floodplain, and stream channel change many of the factors determining channel configuration. Increased sediment off the watershed is a common result of human actions and sediment is a major determinant of channel shape (Leopold 1997). When the dynamic equilibrium has been disrupted, the channel begins a process of adjustment as it attempts to restore a dimension, pattern, and profile that are consistent with controlling hydraulic variables (Rosgen 1996). These adjustments may lead to dramatic changes in the stream channel width, depth, and geometry that encroach on human activities, such as has occurred on the Verde River. As human activities are affected, additional flood control and channelization measures may occur, which exacerbate the problems in adjacent areas (Pearthree and Baker 1987), and the channel will continue to become increasingly unstable.

Flood control, channelization and bank stabilization efforts usually take one of several forms: diking, riprap, soil-cement, Kellner Jacks and/or gabions parallel to the channel; check dams across the channel; removal of woody debris from the channel and floodplain; and rerouting the channel. More rudimentary forms of bank stabilization can be found when old vehicles or other large objects are found stacked along a river bank. It is unknown how many efforts such as described above have occurred along the Verde River by private parties or prior to the listing of threatened and endangered species. A quarter mile of Kellner Jacks were placed at Dead Horse State Park on the Verde River to stabilize banks after 1993 flooding, but did not stay in place following the 1995 floods and traveled downstream (M. Chew, AZ State Parks, pers. com.).

Removing trees, logs, and other woody debris from stream channels is a common form of flood control practiced by private landowners and was also done to increase water supply. However, woody plants and debris are very important to stream function (Minckley and Rinne 1985, Debanò *et al.* 1996) and development of riparian habitat. In 1965, private landowners in the

Verde Valley began a cooperative program to eliminate phreatophytes. The objective was to eliminate or thin riparian plants on 1000 acres of land to increase water supplies for human use. Tree removal did little to save water as it simply hastened flow through the Valley (Tellman *et al.* 1997). The Forest Service conducted a similar watershed clearance project on Beaver Creek (Tellman *et al.* 1997). Today, the practice of removing riparian vegetation to reduce the impact of flooding in the Verde Valley continues (F. Toupal, NRCS, pers. com.).

Land use

Human populations in Yavapai County have increased dramatically. Eight incorporated cities (Camp Verde, Chino Valley, Clarkdale, Cottonwood, Jerome, Prescott, Prescott Valley, and Sedona) exist within the county. The population has increased over the last 50 years, especially since the 1970s. The human population was in the 100s in the 1870s, and grew to 24,991 in 1950, 37,005 in 1970, 68,145 in 1980, and 107,714 in 1990 (Office Assist Enterprises 1999). In the 1998 the population of Yavapai County was 148,500 people. Since 1998, the county has continued to grow in population. Camp Verde itself has a population of approximately 9500 people. All of the incorporated communities in Yavapai County and some other adjacent counties and communities use the Verde River and/or its watershed for water, recreation, housing, industrial, agricultural, and commercial use.

Development

Land use has changed in the Verde Valley as the western United States and Arizona's human population has grown. The increase in population and cost of primary and secondary homes in Phoenix, and other areas surrounding the Verde Valley such as Flagstaff and Sedona, and adjacent states such as California, has caused the Verde Valley to become an attractive option. A more hospitable climate than Phoenix and proximity to other nearby communities and climates has also provided incentives. Based upon a historical photo analysis of the northern third of the Verde Valley (Cottonwood, Clarkdale, Tuzigoot, and Dead Horse State Park), approximately 2100 acres were developed, with only 800 acres established for residential and commercial use in 1940 (S. Masek-Lopez, *in lit.*). The remaining 1300 acres were agricultural lands. In 1995, the total land use area had nearly doubled, with about 4100 acres developed. While agricultural use had dropped to about 700 acres, residential and commercial use had increased to about 3400 acres. The remaining portions of the Verde Valley are expected to show similar trends in land use.

Urbanization near the Verde River has reduced the ability to establish dense riparian vegetation. Development has created and maintained the demand for domestic and industrial water use resulting in increased groundwater pumping and flood control structures that alter stream hydrology and also increases bridges, roads, vehicles, sand and gravel mining and other industrial and commercial uses detrimental to riparian habitat. Urbanization has also increased the demand for recreational use of remaining riparian areas for trails, campgrounds, and use of river areas for off-road vehicles, etc. Developments and recreation increase trash, lawns, bird feeders, and habitat fragmentation, and as a result, an increase in predators of passerines such as cowbirds, house cats, grackles, and ravens (Ehrlich *et al.* 1988, Rodriguez-Estrella *et al.* 1991, Knight *et al.* 1995, McCarthey *et al.* 1998, Finch and Stoleson, 2000, USFWS 2001).

Development adjacent to and in the bottomlands or floodplains has eliminated and/or degraded watersheds and riparian areas (Leopold 1997). Changes to the watershed that affect how runoff is delivered to the river have effects to patterns of erosion and aggradation of sediments and influence how the river will move across its floodplain (Leopold 1997). Erosion has formed tall, steep banks that have prevented flooding of adjacent floodplains and caused changes to the height of the water table. Riparian vegetation has been lost or unable to regenerate because the water table has moved below the level their roots can reach or become established. "It is known that urbanization increases flood peaks; roads, parking lots, roofs, forest clearing, and agricultural fields laid bare of vegetation tend to increase peak flows of river, just as if the climate itself has changed (Leopold 1997)."

Water use

The Verde Valley adjacent to the Verde River is largely privately owned. The water in the entire Verde River can be diverted between the Town of Cottonwood and Oak Creek for agricultural purposes, before water is returned to the riverbed. While surface water diversion of nearly 20,000 acre feet have occurred annually from 1970 to 1990, groundwater pumping has increased from about 35,000 acre feet per year to just over 50,000 acre feet per year (from 1985 to 1990) (Tellman *et al.* 1997). It is likely that pumping has increased over the last 11 years since the Verde Valley is not in an active State Management Area. Towns such as Prescott have all but eliminated the flow of Granite Creek into the Verde River (Tellman *et al.* 1997). Developments in areas such as Chino Valley use groundwater, which appears to be affecting surface water supplies downstream (Tellman *et al.* 1997). The extent of groundwater overdraft (water resources that are not being replenished) in this area and the remaining central and southern parts of Arizona was considered critical (Leopold 1997).

Sand and gravel mining

Mining for sand and gravel is an important industry in the Verde Valley from Tapco downstream to Camp Verde (Tellman *et al.* 1997). Demand for these materials has grown as the population and development increases. Growth in the Verde Valley and Flagstaff depend largely on Verde Valley sand and gravel. For every 1,000 new Arizonans, 7,000 additional tons of sand and gravel are required (Tellman *et al.* 1997).

The Verde River is one of the few rivers in the United States where sand and gravel is mined from a live stream. Gravel mining also erodes the river channel and causes instability, migration of the stream channel, lowering of water tables, loss of sand and gravel to the river, increased siltation, and lowered water quality (Tellman *et al.* 1997).

Agriculture

While it appears that agriculture is decreasing in the upper portions of the Verde Valley, agricultural development has involved not only direct clearing of riparian vegetation, but also has resulted in the re-engineering of floodplains (e.g. draining, protecting with levees), diverting water for irrigation, groundwater pumping, and herbicide and pesticide application. These factors affect the maintenance and development of riparian habitat and can influence the success

of nesting birds (Finch and Stoleson 2000, USFWS 2001). Agricultural development can also increase the severity of cowbird parasitism (USFWS 2001).

Recreation

In the warm area of the Verde Valley, recreation is often concentrated in riparian areas of the Verde River because of the shade, water, aesthetic values, and the fishing, boating, swimming, and hiking opportunities it provides. These activities have reduced riparian vegetation due to trampling, clearing, wood cutting and soil compaction. Increased and concentrated recreation use also results in bank erosion; increased fire risk; promotion of exotic plant species; increases in predators and scavengers such as ravens, grackles, domestic cats, and skunks due to food scraps and garbage; heavier cowbird parasitism; and noise disturbance (USFWS 2001). Outside of the action area, designated open spaces such as Tuzigoot, Dead Horse State Park, or U.S. Forest Service lands in the Verde Valley do not support any known nesting flycatchers.

Because the Verde River is largely privately owned, there are only three public access locations to the Verde River downstream from Highway 17 through the Town of Camp Verde (inside the action area). Access to the river exists at the White Bridge (3 miles downstream from project site); however, this is not a developed recreation area. Both West Clear Creek (5 miles downstream) and Beasley Flat (6.5 miles downstream) are the nearest and only designated recreation areas along the Verde downstream of Highway 17 in the Verde Valley.

Cattle grazing

Livestock grazing on private lands throughout the Verde Valley and U.S. Forest Service lands upstream and downstream of the Valley has regularly occurred since the 1880s, soon after settlers moved into the Valley (Tellman *et al.* 1997). By 1913, erosion, from damage to the watershed, had deepened the river channel. Beginning in the mid to late 1990s, the Prescott and Coconino National forests began to fence livestock grazing out of the floodplain of the Verde River on Forest Service lands. Over-utilization of riparian vegetation by livestock, elk, and horses reduces the density of flycatcher habitat vegetation. Consumption of palatable broadleaf willows and cottonwood saplings and understory grasses and forbs alters riparian habitat structure and favors the colonization of unpalatable or grazing-tolerant exotic plant species.

Land use between Highway 17 and Beaver Creek Bridge

The footprint of the development and adjacent area (Highway 17 to Beaver Creek bridge) has encountered many of the activities that have led to the southwestern willow flycatcher being federally listed. To date, these activities exist mainly at both ends of this stretch of stream. Highway 17, automobile bridges, housing, cattle grazing, sand and gravel mining, and commercial development occur throughout this area. From about 0.5 miles upstream of Highway 17 downstream to the Beaver Creek bridge, 69 different private parcels exist that are adjacent to the river. These parcels total 554 acres. In this stretch of river, there are no current conservation easements, management plans, or otherwise designated areas for the development, maintenance, restoration, and protection of riparian habitat or flycatcher nesting habitat.

Concentrated human activity and development primarily occurs at the highway exit and shopping center. At the Highway 17 exit to Camp Verde, commercial development, including hotels, gas

stations, and restaurants occurs. Automobile bridges occur over the Verde River and Beaver Creek. There is a shopping center near the Beaver Creek bridge with a grocery store. Two small neighborhoods exist at each end of this stretch of river.

While activity occurs at the edge of this stretch of stream, the land adjacent to the river is largely undeveloped. The largest parcel (125 to 150 acres) with riparian habitat from Highway 17 to the Beaver Creek bridge) is owned by Superior Materials. The Camp Verde flycatcher breeding site is contained within this parcel of property. Gravel mining had been the primary activity on the Superior Materials property. The land is not currently being mined and mining has been absent for an unknown amount of time (H. Yard, SWCA, pers. com.). Behind the Camp Verde site are some industrial storage facilities and commercial sites located near the Camp Verde highway exit. The proposed 388-acre development (including the 25 acres of floodplain and flood-prone habitat) was largely used for livestock grazing before being sold to Harvard Investments for the proposed housing community. Between the Superior Materials property and the proposed project's boundaries is an isolated section of U.S. Forest Service land. This is an undeveloped 10-acre piece of habitat located mostly on a terrace above the floodplain. A small length of floodplain riverside habitat exists on this parcel.

The 25-acre Conservation Area parcel of floodplain and flood prone habitat was partially cleared by bulldozers from Harvard Investments on March 15, 2000 (Figure 3-5). This included removing dead and downed wood, brush, and groundcover by using heavy equipment. The base of cottonwood trees were scoured, exposing the roots of the cottonwood trees. Cottonwoods were burned and scarred by burning brush at the base of the trees. The floodplain and riparian vegetation were altered by heavy equipment grooming or leveling out the floodplain. The habitat prior to clearing was likely not suitable for nesting flycatchers, however this area appears to be able to develop into nesting habitat, and is likely used by breeding and non-breeding southwestern willow flycatchers for dispersing, migrating, foraging, or fledging. The clearing likely resulted in further delaying the development of this habitat to suitability for nesting.

Across the river from the Superior Materials property and the project area is a sand and gravel operation. The sand and gravel mining operation has removed suitable flycatcher nesting and foraging habitat, diverted water from the Verde River, and degraded stream banks and the floodplain by the use of heavy equipment such as front end loaders and excavators (G. Beatty, USFWS, pers. observation).

Status of the species in the action area

A total of 61 sites has been surveyed for southwestern willow flycatchers in the Verde River system since 1993 (Paradzick *et al.* 2001). These survey sites varied in size from small isolated habitat patches to the entire Verde River from Childs to Ister Flat. At those surveyed areas, singing (territorial) willow flycatchers were detected at five locations. From 1993 to 1996, a total of 1 or 2 pairs of flycatchers were known from Tuzigoot Bridge and Tavasci Marsh near Clarkdale and Peck's Lake, these sites have since been unoccupied (Paradzick *et al.* 2001). The only territorial pairs (ranging from a high of 10 in 1997, to a low of 5 in 2000) detected in the

action area (and on the Verde River) since 1998 have been at one location, at the Camp Verde site, immediately adjacent to the proposed development (Figure 1) (Paradzick *et al.* 2001).

SWCA (1999) detected southwestern willow flycatchers on two occasions in 1999 within and just outside the boundaries owned by Harvard Investments at The Homestead (Figures 1 and 2). “During the habitat evaluation conducted on May 26, 1999, one adult willow flycatcher was seen and heard singing sporadically in a mesquite thicket along the irrigation ditch (within the boundaries of The Homestead). Since this flycatcher was found in unsuitable (nesting) habitat for this species, it was likely a migrant en route to a breeding area (SWCA 1999).” However, from 1996 to 1998 territorial nesting flycatchers were detected 13 times at the Camp Verde site between May 17 and May 30 (SWCA 2000a). It is possible, due to the proximity of this breeding location, the flycatcher detected on May 26, 1999 was a territorial flycatcher from the Camp Verde site. “On July 6, 1999, during a southwestern willow flycatcher survey on a smaller, adjacent parcel, a flycatcher was detected on the northern boundary of the 363-parcel. This portion of the parcel is within the 100-year floodplain...(SWCA 1999).” SWCA’s (2001) Biological Assessment for this project clarified that the bird detected on July 6, 1999 was 66 feet outside the boundary of The Homestead.

Surveys conducted by the U.S. Geological Survey also detected territorial southwestern willow flycatchers during the breeding season between the northern boundary of The Homestead and the 25-Acre Conservation Area (Figures 1 and 2). Three flycatchers were detected on June 4, 1999 and another was detected on July 7, 1999. These birds were detected from across the river and were likely the same birds detected on July 6, 1999 by SWCA (1999, 2001). These detections are all similar to the July 7, 1999 detection by SWCA in that they are located directly adjacent to the boundaries of The Homestead.

Although nest sites did not occur on the Harvard Property, the flycatcher’s close proximity to the Camp Verde site and additional breeding season detections indicate that flycatchers use the floodplain and flood prone area of the Harvard Property. Due to the immediate proximity of breeding flycatchers and territorial flycatcher detections, the riparian habitat, floodplain, and flood prone area on the Harvard property, while not used specifically for nesting, may be important to flycatchers nesting on adjacent property by providing the matrix of habitat for: population growth; migration; dispersal; foraging; prey production; solar protection; noise buffer; and protection from predators and nest parasites (Finch and Stoleson 2000, USFWS 2001).

Research has described that the known flycatcher nest areas of the Camp Verde site are contained within the Superior Materials parcel of land (SWCA 2000a). Flycatchers nest at the downstream end of this property. These bird’s nesting habitat is within 600 feet of the proposed project’s boundaries. The other acreage on the Superior Site, not specifically used for nest placement, is critical for the integrity of the bird’s territory, home range, and population. Riparian vegetation at the site consisted primarily of discrete patches of gallery forest dominated by Fremont cottonwood and Goodding willow forming a discontinuous canopy up to approximately 70 feet in height. Dense stands of tamarisk up to 25 feet in height occurred discontinuously, both as

understory associated with gallery forest and as discrete patches between stands of gallery forest (SWCA 2000a).

At the Camp Verde site, the number of flycatcher territories has declined from a known high of 10 in 1997 down to 5 in 2000. Surveys were not conducted in 2001 (T. McCarthey, AGFD pers. com). Breeding flycatchers were first detected at this site in 1994 (n=7) (Paradzick *et al.* 2001), but no surveys were done in 1995. Detailed monitoring of the distribution, abundance, and nesting success at this site began in 1996 (SWCA 2000a). Forty-six nesting attempts (birds often laid more than one clutch) from 1996 to 1998 were found and monitored. Forty-five nests were placed in tamarisk and one in Goodding willow. Nest height ranged from 6.8 to 37.7 feet off the ground. Thirty-four flycatcher young were assumed to have fledged from 18 successful clutches between 1996 and 1998 (SWCA 2000a). In 1999, 2 pairs from 5 territories attempted to nest 7 times. Two nests were successful, and 5 nests failed (4 were parasitized) (Paradzick *et al.* 2000). In 2000, 4 pairs from 5 territories attempted to nest 6 times. Two nests were successful and 4 failed (1 was parasitized) (Paradzick *et al.* 2001).

Cowbird parasitism of southwestern willow flycatcher nests at the Camp Verde site was documented each year monitoring has occurred (SWCA 2000a, Paradzick *et al.* 2000, 2001). Thirteen of 48 clutches (27.1%) were parasitized from 1996 to 1998 (SWCA 2000a). Five of 13 clutches (38.5%) were parasitized from 1999 to 2000 (Paradzick *et al.* 2000, 2001). The five-year average for cowbird parasitism on nesting southwestern willow flycatchers in this area was 29.5 percent. No known site in the State of Arizona had more cowbird parasitism in 1999 and 2000 than the Camp Verde site (Paradzick *et al.* 2000, 2001). While cowbird trapping occurred at the site in 1998, 1999, and possibly 2000, this trapping was for research purposes, and cowbirds were not removed to lower the local population and reduce the pressure of parasitism on breeding flycatchers (M. Sogge, USGS, pers com.).

Predation on willow flycatcher nests and possibly breeding adults occurred annually since 1996. Some flycatcher eggs were found punctured and attributed to cowbirds, which may overestimate the role cowbirds played in breeding failure (SWCA 2000a). Other predators such as grackles are known to remove or puncture eggs. Eleven clutches (23.9%) from 1996 to 1998 (SWCA 2000a) and 4 (30.8%) in 1999 and 2000 (Paradzick *et al.* 2000, 2001) were believed to have been preyed upon. Tracks of domestic cats and raccoons (predators of passerine birds) were detected in nearby areas on numerous occasions, but the exact source of predation was unknown (SWCA 2000a).

Recreation use at the Camp Verde site was not quantified by SWCA (2000a), but classified as “apparently regular.” Low-level noise from traffic along Highway 17 was regularly audible at the site, as was heavy equipment from the sand and gravel operation across the river. A network of six-foot wide trails resulting from use by all-terrain vehicles (ATV) existed, as well as apparently regular use by hikers, birdwatchers, anglers, and others.

The cause of the reduction in territories at the Camp Verde site in successive years is unclear. Cowbird parasitism is a concern (SWCA 2000a). Currently, the lack of suitable and occupied flycatcher habitat in northern Arizona, the Verde River, and specifically the Verde Valley leaves

the small Camp Verde site a long distance away from nearby populations. However, flycatcher populations naturally fluctuate in response to many factors such as annual precipitation, habitat changes, local and meta-population changes, etc. Known flycatcher populations in the Verde Valley have fluctuated from 2 known territories in 1993, to 10 in 1997, and 5 in 2000 (Paradzick *et al.* 2001).

The recovery rate of breeding populations on the Verde River will be a function of local population dynamics (i.e. total population size, annual reproductive success and mortality rates, rates of dispersal from other breeding locations, immigration and emigration) and habitat suitability. The Verde River is an important area for flycatcher recovery because it is the third largest river in Arizona, it is centrally located within the flycatcher's range, and it is largely free-flowing. Because local populations are widely separated and small in size (Muiznieks *et al.* 1994, Sferra *et al.* 1995, Paradzick *et al.* 2000, USFWS 2001), recovery rates are anticipated to be slow. The draft flycatcher recovery plan (USFWS 2001) described, based upon a population viability analysis (Lamberson *et al.* 2000, Noon and Farnsworth 2000) and the Technical Recovery Team's collective knowledge, items which are important for recovery: populations should be distributed throughout the bird's range; populations should be distributed close enough to each other to allow for movement; large populations contribute most to metapopulation stability; small populations can contribute to stability when arranged in a matrix with high connectivity; as a population at a site increases, the potential to disperse and colonize increases; increase/decrease in one population affects other populations; maintaining/augmenting existing populations is a greater priority than allowing loss and replacement; and establishing habitat close to existing breeding sites increases the chance of colonization.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated with and interdependent on that action, that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification.

Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Overview

The Service expects that without the implementation of the Conservation Measures proposed by Harvard Investments, "The Homestead at Camp Verde" would result in adverse effects to known breeding, migrating, dispersing, or foraging flycatchers at the Camp Verde site, future breeding flycatchers in the action area, and potential/developing and/or regenerating flycatcher habitat in the proposed 25-acre Conservation Area. However, the Conservation Measures proposed by Harvard Investments are expected to ameliorate most of the adverse effects. As a result of human recreation effects on soil and vegetation, we expect this project would limit and/or delay the development of flycatcher habitat to suitability inside the 25-acre Conservation Area.

Trespass recreational activities would likely disturb any flycatchers in the Conservation Area.

Increased parasitism and predation would likely occur as result of the changes in land use. Paving, housing, development of non-permeable surfaces and groundwater pumping are expected to contribute to degrading the Verde River ecosystem through the Verde Valley. Road development and vehicular traffic are expected to provide a greater mortality risk to migrating, breeding, fledging, and dispersing southwestern willow flycatchers. The effects of this action will not occur immediately, but slowly over time as the proposed housing development is completed.

Harvard Investments proposes a variety of Conservation Measures to reduce the impact of the proposed development. Restricting access to the 25-acre Conservation Area during the breeding season, prohibiting use of bird-feeders, flycatcher monitoring, cowbird trapping, and limiting pets to homeowners yards, are expected to reduce most of the adverse effects to nesting flycatchers and flycatcher habitat from increased human recreation, the housing development, cowbird parasitism, and predation. Leaving a vegetated buffer between the development and the 100-year floodplain on the northwestern portion of the parcel will reduce noise disturbance to nesting flycatchers on the adjacent property and provide a visual barrier between the habitat and the development. This mesquite habitat adjacent to the floodplain and in close proximity to the nesting flycatchers may also be a source of insects and important habitat for fledglings, dispersal, and migration. The use of mostly native trees should reduce excessive water needs and is expected to reduce the likelihood of exotic vegetation becoming established. A 25-mile per hour speed limit will reduce the likelihood of collision with flycatchers. Signing, fencing, seasonal closures, monitoring, education programs, periodic maintenance, and adaptive management in the 25-acre flycatcher Conservation Area will appreciably reduce the adverse effects of recreation on the development of flycatcher habitat.

Increased human access to riparian area

Increased human use not previously occurring in this community, at this concentration, and at this location of the Verde River, will significantly change the environmental baseline for the life of the project. The life of the project is expected to be in perpetuity as a result of the development of residential and commercial property. The increase in population of Camp Verde will be at least 2000 people; an approximately 25 percent increase in the existing population of 9500.

Where there was previously little human use of the river area and no legal public access, the development will bring residents adjacent to the river by allowing legal recreational use of the river and riparian area. Additionally, the community will not be gated, thus there will be additional use of the river area from visitors and guests of The Homestead. While use of the Conservation Area is authorized for use only by people residing in The Homestead or their guests, there is not a current system which would limit use of the Conservation Area by other visitors.

25-acre Conservation Area

A 25-acre parcel will be set aside as a Conservation Area in order to protect the southwestern willow flycatcher and designated critical habitat for spikedace, loach minnow, and razorback

sucker. As described in the Conservation Measures, this fenced and gated land will be closed during the flycatcher's breeding season, and will contain only one non-vehicular trail through it to the river. Information and education programs will also be implemented to increase the chances of successful flycatcher reproduction. There are no known examples of the persistence of nesting southwestern willow flycatchers in suburban areas (USFWS 2001), and no known nesting southwestern willow flycatchers are associated with high density housing and high recreational use in Arizona. Human activity is not likely to stay contained within the proposed trail in the Conservation Area, nor be completely kept from accessing the river area during the April 15 to September 15 closure season. Some people are likely to disperse and not stay confined to a single trail or at single point on the river. There will be emergency road access to the river area, that will necessitate development of vehicle access. With the limited locations to access the Verde River downstream of Highway 17, residents of the development, other community members, as well as out-of-town visitors, are able to access the Verde River at the Conservation Area for recreational opportunities. Already, the Camp Verde flycatcher site and adjacent parcels of land in the action area, without legal public access, receive regular low-level use by ATV enthusiasts, hikers, birdwatchers, and anglers (SWCA 2000a). Therefore, as a result of the development, year-round residents, and creation of legal public access, some human activity will likely occur throughout the proposed 25-acre Conservation Area, but it will be appreciably reduced by the implementation of the proposed Conservation Measures.

Effects of recreation on flycatcher habitat

As a result of the development, year-round residents, river access, and lack of daily enforcement on the 25-acre Conservation Area, recreation will likely adversely affect the soil, vegetation, and aquatic system as it regenerates and develops into southwestern willow flycatcher habitat as supported by Cole and Landres (1995) and Finch and Stoleson (2000). Presently the 25-acre Conservation Area does not have suitable nesting habitat, but the Service believes that it currently can be used by both non-breeding and breeding southwestern willow flycatchers for foraging, migrating, or dispersing. Flycatchers have been detected within the boundaries of The Homestead and directly adjacent to the property (SWCA 1999, 2000a). The proposed action provides for a trail and fenced access to the river bottom from September 15 to April 15 annually. During that time period, there will be no limit to the amount of people that can enter the Conservation Area, and once the floodplain and river is reached, there is unrestricted access to the river bottom. This human activity could prevent or delay the development of flycatcher habitat to suitability for nesting and degrade existing habitat through continued trampling of the soil and vegetation in the floodplain.

Flather and Cordell (1995) reported that given the growing number of outdoor recreationists, the notion that recreation has no environmental impacts is no longer tenable. Recreationists often degrade the land, water, and wildlife resources that support their activities by simplifying plant communities, increasing animal mortality, displacing and disturbing wildlife, and distributing refuse (Flather and Cordell 1995). Many of these effects could occur in the 25-acre Conservation Area.

Cole and Landres (1995) reported, based upon a compilation of research, the effects of recreation on soil. Most of these studies report the results of human trampling caused by hiking, camping, fishing, and nature study. These types of activities are expected to occur in the floodplain and flood-prone area associated with this project, as well as illegal use by ATVs and bicycles, and occasional emergency vehicle use. Impacts to soils include the loss of surface organic horizons, compaction of mineral soil, reduction in macro and total porosity, reduction in infiltration rates, and increases in soil erosion. Other impacts include both reductions and increases in soil moisture and increases in diurnal and, perhaps, seasonal range of soil temperature.

As a result of recreation, changes in soil characteristics adversely affect the germination, establishment, growth, and reproduction of flycatcher habitat. Compaction reduces the heterogeneity of soil surfaces and, therefore, the density of favorable germination sites. Compaction increases the mechanical resistance of the soil to root penetration and can reduce the emergence of seedlings. Reduced macroporosity can result in the oxygen shortages and less water being available to plants. These physical changes, along with reductions in organic matter and changes in soil microbiota, can seriously disrupt ecosystem processes and impede soil-plant-animal interactions, causing decreases in primary productivity (Cole and Landres 1995).

The most obvious direct impacts on vegetation come from the crushing, bruising, shearing, and uprooting of vegetation that often accompanies recreational use. Various changes in individual plant characteristics occur including reductions in plant height, stem length, leaf area, flower and seed production, and carbohydrate reserves. Plants are often killed outright. Those that survive typically are not as vigorous and reproduce less successfully. Consequently, recreation areas have vegetation that is less abundant (reduced density and cover), of a reduced stature, and with a different species composition from undisturbed areas (Cole and Landres 1995).

Trespass into the 25-acre Conservation Area

The Conservation Area will be closed for a portion of the year and always from sunset to sunrise, yet some trespass is reasonably certain to occur. The proposed action does not provide enforcement, daily monitoring, or fines to prevent prohibited activities or minimize trespass into the 25-acre Conservation Area during the evenings or from April 15 to September 15.

Depending on the level of trespass, continued degradation to soil and vegetation as described above may affect the development of nesting habitat to suitability, impact existing habitat used by breeding and non-breeding southwestern willow flycatchers, and possibly disturb breeding, foraging, dispersing, or migrating southwestern willow flycatchers.

The Service expects that some Homestead residents and visitors likely will trespass into the 25-acre Conservation Area during the closed hours and seasons, similar to what has been recorded for endangered species breeding area closures on the Verde River and other central Arizona rivers over the last 20 years. There has been considerable effort in trying to manage public access to areas along rivers on National Forests, State Parks, State Wildlife Areas, County Parks and Recreation, and Tribal Lands in Arizona for endangered species or wilderness values. Land managers in Arizona have discovered that signs, education, fines, the threat of fines, and daily monitors do not prevent people from entering bald eagle breeding area closures (AGFD 2000).

Management of bald eagle nest areas since the 1970s, for example, has included similar, but more extensive management than what is proposed for the Conservation Area. Management of bald eagle nest areas have included: seasonal closures; State, Federal, Tribal, and County law enforcement; signs at closure boundaries; fences and gates at closure boundaries; monitors on site 24 hours a day for 22 days a month during the entire breeding season; on-site interpretation; brochures; viewing stations; annual local television news segments; and magazine articles (AGFD 2000). In 1996 and 1997, approximately 14,000 human activities and nearly 4000 gunshots were recorded within 0.6 miles of 13 different bald eagle nests (AGFD 2000). The greatest amount of human activity in and around bald eagle breeding area closures occurred on the lower Verde River where, similar to The Homestead, there is easy access and close proximity to the residential communities of Rio Verde, North Scottsdale, Cave Creek, and Fort McDowell (J. Driscoll, AGFD pers. com.). However, the extent of trespass into the Conservation Area can not be predicted.

Predation and parasitism

The development of this residential and commercial property likely will increase the population of predators and cowbirds in the action area. Increases in residential density may attract avian predators, such as great-tailed grackles (*Quiscalus mexicanus*), which prey on passerine nestlings (Ehrlich *et al.* 1988). Increased vegetation density from artificial community landscaping and trash, likely results of this development, increase the local feeding, roosting, and reproduction opportunities for brown-headed cowbirds (Finch and Stoleson 2000). As a result, the development would likely increase cowbird parasitism and predation of flycatchers at the Camp Verde site and other future locations along the Verde River. Populations separated by larger distances from other flycatchers, like the Camp Verde site, are considered more at risk to the effects of cowbird parasitism (Finch and Stoleson 2000, USFWS 2001). Cowbird trapping will be implemented by Harvard Investments, and when implemented, expected to keep cowbird parasitism rates at baseline levels.

Roads, Development and the Watershed

The development will alter the infiltration of moisture into the ground as a result of erecting buildings, roads, and other paved and reduced permeable surfaces. Currently, the 388-acre residential and commercial site is undeveloped and is vegetated by grasses, juniper, mesquite, and cacti outside of the riparian zone. The immediate hydrologic effect of urbanization will be to increase the area of low or zero infiltration capacity (Dunne and Leopold 1978). Over the long-term, urbanization can degrade the watershed by reducing riparian habitat and regular streamflow, and by increasing excessive runoff, channel width to depth ratios, flood frequency, channel downcutting, and sediment yield (Dunne and Leopold 1978). Reduced infiltration of water into the ground through percolation can reduce the groundwater table and subsequently the amount and extent of existing occupied flycatcher riparian habitat, limit the development of flycatcher habitat and/or regeneration and maintenance of flycatcher habitat.

The development of roads and moving vehicles throughout the project area will be a significant change to the action area and may generate some mortality risk for flycatchers. There will be greater than five miles of new road developed adjacent to the 100-year floodplain and throughout

this development that is within 600 feet of nesting southwestern willow flycatchers. Roads and moving vehicles increase the risk of collision to migratory, breeding, foraging, fledging, and/or dispersing southwestern willow flycatchers. Foppen and Reijnen (1994) and Reijnen and Foppen (1994) documented reduced breeding success, lower breeding densities, and higher dispersal rates of willow warblers (*Phylloscopus trochilus*) breeding next to roads that bisect forested habitat. Sogge (1995a) noted that the population decline and changes in the distribution of willow flycatcher territories on the Verde River in Arizona were consistent with other studies documenting adverse effects of roads that bisect habitat. In addition, a willow flycatcher was killed by an automobile on a rural road that bisects willow flycatcher habitat in the White Mountains of Arizona (Sferra *et al.* 1995). Although moving vehicles are one of the few recorded reasons for the cause of an adult flycatcher's death (Finch and Stoleson 2000), it is difficult to determine whether a collision with a vehicle is reasonably certain to occur, because there are no known instances of housing developments and few instances of road traffic adjacent to occupied flycatcher habitat in Arizona. The 25-mile per hour speed limit adjacent to the river north of the Verde Ditch is expected to minimize the risk of collision.

Water

The source of water for the development is located in Camp Verde. Wells on the Homestead parcel will be retired, which is a benefit to the Verde River. Water will be provided by the Camp Verde Water System, a private supplier. Water needs have been estimated at 436 acre feet per year (260 gallons per minute). Water will be produced from groundwater from two wells five miles upstream of the development and about 1.3 to 1.5 miles from the river. Wells are drilled down to an aquifer 500 to 563 feet in depth below the upper alluvium. The Arizona Department of Water Resources (R. Barnes, ADWR, pers. com.) has no information on the relationship of the aquifer to the groundwater that supports the riparian habitat and surface flows of the Verde River. Therefore, we have no information on which to analyze whether continued pumping from these wells will reduce the amount of surface water in the Verde River or lower the groundwater table from riparian habitat for southwestern willow flycatchers. However, the added use from this well may exacerbate use of future water resources in the Verde Valley from sources known to be connected to the Verde River.

Summary

The proposed action may contribute to the loss and future development of southwestern willow flycatcher breeding habitat at the Camp Verde site, the only known location on the Verde River with nesting southwestern willow flycatchers. Loss of this known breeding southwestern willow flycatcher habitat on the Verde River would greatly increase the distance between known breeding groups, reduce movement between locations, reduce metapopulation stability, reduce site stability, and decrease dispersal and colonization.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, or private actions that are reasonably certain to occur in the action area are 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.

Land use practices that impact southwestern willow flycatchers in the Verde River watershed, including those of the State, private, and other lands are expected to continue to occur. Much of the land along the Verde River in the Verde Valley is privately owned. As a result, those activities described in the environmental baseline that have contributed to the condition of the Verde River in the Verde Valley are expected to continue. Ongoing activities or occurrences on these private lands that would continue to affect flycatchers and flycatcher habitat include: residential use and development, commercial development, gravel mining, road development, surface water diversion, groundwater extraction, proliferation of exotic and natural predators, increased number of cowbirds, increased risk of fire, increased presence of exotic plant species, livestock grazing, irrigated cropping, stream channelization, bank stabilization, and other instream management for water diversion. These activities are largely the cause for this species to be listed and continue to contribute to the degraded condition of the stream and riparian habitat in Verde River.

Future residential and commercial development in Yavapai County and the Verde Valley will occur. The Arizona Department of Economic Security predicted that the year round population in Yavapai County from 1997 to 2010 would increase about 37 percent or about 2.8 percent annually (SWCA 2001). The Camp Verde Chamber of Commerce predicts that the population of their town will increase about 42 percent over the same time period (SWCA 2001). As a result, residential and commercial developments in the Verde Valley will escalate use of the Verde River's resources for water, recreation, agriculture, etc.

The future availability of surface water and groundwater to maintain and recover riparian habitat for the southwestern willow flycatcher is threatened by groundwater pumping from the Big Chino aquifer at the headwaters of the Verde River. This aquifer provides 80 percent of the base flow of the upper Verde River (Wirt and Hjalmarsson 1999). The cities of Prescott, Prescott Valley, and Chino Valley have developed proposals to pump water from this aquifer and deliver water through a pipeline to these growing communities. Future projects such as the pumping of the Big Chino aquifer are anticipated to significantly alter the hydrology and groundwater of the Verde River, and subsequently the development and maintenance of flycatcher habitat.

The cumulative effects of development on southwestern willow flycatcher nesting habitat in the Verde Valley are significant. The expected growth, development, recreation and reliance on the resources of the Verde River will escalate. Cooperative ecosystem management plans seem less feasible as the number of home owners increases and parcel size decreases and where there is no historical or contractual basis for shared land stewardship (Knight *et al.* 1995).

Within the action area of The Homestead and especially the immediate area of the project between the Highway 17 to Beaver Creek bridge, the Service anticipates significant increases in concentrated and dispersed human activity. Human activity associated with the development and recreational access may result in some trespass onto adjacent property and impact occupied nesting flycatcher habitat, suitable, or potential/developing flycatcher nesting habitat (Cole and

Landres 1995, Finch and Stoleson 2000). Ambient noise levels are expected to increase with levels of sustained activities associated with residences and businesses. Residents and visitors will likely use the Verde River riparian area for walking, running, fishing, and other recreational activities. Such human activities (outside of the footprint of The Homestead) may affect breeding, foraging, dispersing, migrating, or nestling flycatcher behavior (Rourke *et al.* 1999), adversely modify riparian habitat (Cole and Landres 1995), or attract avian and mammalian predators (Finch and Stoleson 2000). Loss of vegetation density and diversity through effects of human recreation alters suitability of flycatcher habitat for nesting and foraging, and increases exposure to predators and brood parasites (Aitchison 1977, Guth 1978, Finch and Stoleson 2000). Rural subdivisions adjacent to public lands and protected areas are likely to make ecosystem management more difficult (Knight *et al.* 1995).

As described in Harvard's Biological Assessment (SWCA 2001), enforcing the CC&R's that prohibit outdoor cats and use of bird feeders will be difficult to enforce. The Service agrees with SWCA's assessment, and believes it is reasonable to anticipate that some domestic cats will escape the homes of their owners and, although unauthorized, some bird feeders will be used. Free-ranging domestic cats are potential predators on small birds (Knight *et al.* 1995, Rodriguez-Estrella *et al.* 1991). Even when predation by domestic cats is not significant overall, it likely presents a serious threat to endangered species (Rodriguez-Estrella *et al.* 1991). Bird feeders in The Homestead will improve and boost local feeding opportunities for brown-headed cowbirds and other avian predators, increasing the potential for cowbird parasitism and predation. All of these factors are likely to increase predation and brood parasitism of the flycatcher (Finch and Stoleson 2000).

The significant increase in human activity as a result of residential/commercial development and recreation creates a greater risk of catastrophic fire in riparian areas (Finch and Stoleson 2000, USFWS 2001). While fire is prohibited in the Conservation Area, during the life of the project, residents from the development or visitors to the Conservation Area may accidentally or intentionally start fires within the project boundaries. Tamarisk is abundant in the project area and provides nesting habitat for flycatchers at the Camp Verde site. Given the abundance of tamarisk at the Camp Verde site and increased human activity due to residential and recreational use, there is a risk of fire in the floodplain that would eliminate occupied and potential flycatcher habitat. The education program for the residents and local community and response and action plan for fire (scheduled for completion by 2005) should minimize the risk and effect of fire.

CONCLUSION

After reviewing the current status of the southwestern willow flycatcher, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that The Homestead at Camp Verde development, as proposed, is not likely to jeopardize the continued existence of the southwestern willow flycatcher. We present this conclusion for the following reasons.

1. Since being listed, southwestern willow flycatcher has increased in numbers including areas not previously anticipated such as at the San Pedro/Gila River confluence and Roosevelt Lake.
2. The conservation measures proposed as part of the project and described in the “description of the proposed action” section of this opinion, will eliminate most of the adverse effects and will provide some benefit to southwestern willow flycatchers.

INCIDENTAL TAKE STATEMENT

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

The Service does not anticipate take of southwestern willow flycatchers because no nesting flycatchers or flycatcher nesting habitat exists on the property, and the proposed Conservation Measures are designed to protect flycatchers (foraging, dispersing, migrating) and its habitat. The Service does not anticipate take of flycatchers because it is not known if the property will develop suitable nesting habitat in the future. The Service further does not expect that any effects to the habitat of the adjacent Camp Verde nesting pairs can be reasonably expected to result in take, due to the Conservation Measures being implemented as a part of this action.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommends the following actions:

1. Work with the applicants and other cooperators to acquire additional suitable or potential southwestern willow flycatcher habitat in the Verde River watershed, and implement management plans to maintain or recover habitat, reduce disturbance, and reduce brood parasitism by brown-headed cowbirds. If such habitats are already in possession of the EPA or applicant, implement these management actions on those lands.
2. Develop and coordinate an "Adopt a riparian/wetland ecosystem" program for the future school in the Homestead. The program should focus on riparian and wetland ecosystems, their plant communities, and their value to native fish, neotropical migratory birds, and the southwestern willow flycatcher.
3. Work with local communities to establish buffer zones between development and the Verde River floodplain.
4. Work with local communities and developers to establish a mitigation bank for acquisition of southwestern willow flycatcher habitat and management in the Verde Valley.
5. Work with the applicants to develop cooperation with the Service, AGFD, USFS, or another permitted entity to survey and monitor southwestern willow flycatchers according to the most recent protocols (Sogge *et al.* 1997, USFWS 2000, and Rourke *et al.* 1999) during years one through three of any five year cowbird trapping cycle.

In order for the Service to be kept informed of actions that either minimize or avoid adverse effects of that benefit listed species, species proposed for listing, or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation for the southwestern willow flycatcher on the proposed "The Homestead at Camp Verde" development in Camp Verde, Arizona, Yavapai County. As required by 50 CFR 402.16, reinitiation of formal consultation is required if: (1) the amount or extent of incidental take is reached; (2) new information reveals effects of the agency action that may impact listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The Service appreciates the applicant's and EPA's effort to minimize impacts to the endangered flycatcher on this project. For further information please contact Debra Bills (x239). Please refer to the consultation number, 2-21-01-F-148, in future correspondence concerning this project.

Sincerely,

/s/ David L. Harlow
Field Supervisor

cc: Regional Director, U.S. Fish and Wildlife Service, Albuquerque, NM (ARD-ES)

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Table 2. Agency actions that have undergone formal section 7 consultation and levels of incidental take permitted for the southwestern willow flycatcher rangewide.

Action (County)	Year	Federal Agency ¹	Incidental Take Anticipated
Arizona			
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
Eastern Roosevelt Lake Watershed Allotment (Maricopa)	1995	Tonto NF	Indeterminable
Cienega Creek (Pima)	1996	BLM	1 nest annually by cowbird parasitism
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 Operations (Mohave/Yuma)	1997*	USBR	Indeterminable
Blue River Road (Greenlee)	1997	A/S NF	Indeterminable
Skeleton Ridge (Yavapai)	1997	Tonto NF	Indeterminable
White Canyon Fire – Emergency Consultation (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

Table 2. Agency actions that have undergone formal section 7 consultation and levels of incidental take permitted for the southwestern willow flycatcher rangewide.

Action (County)	Year	Federal Agency ¹	Incidental Take Anticipated
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 Restoration Project (Pima)	1998	BLM	Harassment of 1 bird
Kearny Wastewater Treatment (Pinal)	1998	FEMA	Indeterminable
Fort Huachuca Programatic (Cochise)	1998	US Army	None
SR 260 Cottonwood to Camp Verde (Yavapai)	1998	FHWA	Indeterminable
Wildlife Services (ADC) Nationwide consultation	1998	Wildlife Services	in consultation
Alamo Lake Reoperation (LaPaz, Mohave)	1998	ACOE	Loss of 1 nest w/2 eggs in 20 years due to projected inundation
Grazing on 25 allotments on the Tonto NF (Various)	1999	Tonto NF	in consultation
Mingus Avenue Extension (Yavapai)	1999	ACOE	Indeterminable
Duncan HWY 75 Bridge - Gila River (Greenlee)	2000	FHWA	Indeterminable
Red Creek Grazing Allotment (Gila)	2000	Tonto NF	Indeterminable
Interim Surplus Criteria/4/4 (Mohave, La)	2001	USBR	Loss of 372 acres of occupied habitat
Pleasant Valley Grazing Allotment, A-S NF	2001	USFS	None
Peck Canyon Scour HWY I-19 protection (Santa)	2001	ACOE	Indeterminable
Wikieup/Big Sandy Caithness power plant	2001	WAPA/BLM	in consultation
The Homestead at Camp Verde Development	2001	EPA	None
California			

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Action (County)	Year	Federal Agency ¹	Incidental Take Anticipated
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 of 1,100 ac critical habitat
H.G. Fenton Sand Mine and Levee near Pala on the San Luis Rey River (San Diego)	1997	Corps	None
Lake Isabella Dam Operation Re-initiation (Kern)	2000	Corps	inundation of 1,100 ac critical habitat and reduced survival and productivity of all nesting pairs and young
Colorado			
AB Lateral - Hydroelectric/Hydropower Facility, Gunnison River to Uncompahgre River (Montrose)	1996	USBR	None
TransColorado Gas Transmission Line Project, Meeker, Colorado to Bloomfield, New Mexico	1998	BLM	None
Nevada			
Gold Properties Resort (Clark)	1995	BIA	Harm to 1 flycatcher from habitat loss
Las Vegas Wash, Pabco Road Erosion Control Structure	1998	Corps	Harm to 2-3 pairs of flycatchers
New Mexico			
Corrales Unit, Rio Grande (Bernalillo)	1995	Corps	None
Rio Puerco Resource Area	1997	BLM	None

Table 2. Agency actions that have undergone formal section 7 consultation and levels of incidental take permitted for the southwestern willow flycatcher rangewide.

Action (County)	Year	Federal Agency ¹	Incidental Take Anticipated
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; USFS = U.S. Forest Service.

* Jeopardy opinions.

Figure 1. The Homestead Project Site and Southwestern Willow Flycatcher Detection Locations

(Map)

Figure 2. The Homestead at Camp Verde Site Plan

(Map)

Figure 3. Land clearing in 25-acre Conservation Area at The Homestead, March 15, 2000
(Photo)

Figure 4. Land clearing in 25-acre Conservation Area at The Homestead, March 15, 2000
(Photo)

Figure 5. Land clearing in 25-acre Conservation Area at The Homestead, March 15, 2000
(Photo)