United States Department of the Interior

FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE
2369 WEST ORTON CIRCLE, SUITE 50
WEST VALLEY CITY, UTAH 84119

September 18, 2008

In Reply Refer To
FWS/R6
ES/UT
6-UT-08-F-011
65411-2008-B-0007

Memorandum

To: Utah State Conservationist, Natural Resources Conservation Service, Salt Lake City, Utah 84138

Assistant Region Director, Region 6, U. S. Fish and Wildlife Service, P.O. Box 25486, Denver Federal Center, Denver Colorado 80225

From: Utah Field Supervisor, Ecological Services, U.S. Fish and Wildlife Service, West Valley, Utah 84119

Subject: Intra-agency Formal Section 7 Consultation with the U.S. Fish and Wildlife Service and Formal Section 7 Consultation with the Natural Resources Conservation Service for the Proposed Programmatic Safe Harbor Agreement for the Southwestern Willow Flycatcher in Washington and Kane Counties, Utah and associated impacts to the Western Yellow-billed Cuckoo, Virgin River Chub and Woundfin

This biological opinion was prepared by the U.S. Fish and Wildlife Service (Service), Utah Field Office, as required by the Endangered Species Act of 1973 (Act), as amended, for proposed issuance of a section 10(a)(1)(A) Enhancement of Survival permit (Permit) for the southwestern willow flycatcher ("flycatcher"), (*Empidonax traillii extimus*) associated with the implementation of a Programmatic Safe Harbor Agreement (Agreement) within Washington and Kane counties, Utah and associated impacts to the southwestern willow flycatcher, western yellow-billed cuckoo (*Coccyzus americanus occidentalis)*, Virgin River chub (*Gila seminuda*) and woundfin (*Plagopterus argentissimus*). This Agreement is between the Color Country Resource Conservation and Development Council, Inc. (Program Administrator) and the U.S. Department of Interior, Fish and Wildlife Service (Service); hereinafter collectively called the "Parties." The Federal action constituting a section 7 nexus under the Act is issuance of a section 10(a)(1)(A) Enhancement of Survival permit by the Service as well as federal funding for habitat projects as provided by the Natural Resources Conservation Service (NRCS). This

biological opinion has been prepared by the Service in accordance with section 7 of the Act (16 USC 1531, *et seq*.) and Interagency Cooperation Regulations (50 CFR 402).

The Service has determined that the proposed action is "not likely to adversely affect" the Mexican spotted owl. The Mexican spotted owl may utilize riparian habitats for foraging. However, any riparian habitat improvement projects within owl habitat will have beneficial effects by providing improved habitat for prey species. The Service has determined that the proposed action will have "no effect" on other listed or candidate species in Washington and Kane counties because these species do not occur within the project areas or do not inhabit riparian areas. No further analysis of impacts to these species is included in this biological opinion.

The southwestern willow flycatcher is federally listed as an endangered species and occurs within Washington and Kane counties. The western yellow-billed cuckoo is a candidate species and also occurs within Washington and Kane counties. The Virgin River Chub and the woundfin are federally listed as endangered species and only occur within Washington County. This biological opinion evaluates impacts of a Programmatic Safe Harbor Agreement to these four species and was prepared using information contained in the Safe Harbor Agreement application package prepared by the Program Administrator. Additional information was obtained from existing Service files and communications among Service employees and representatives from the Utah Division of Wildlife Resources. A complete administrative record of this consultation is on file at the Utah Field Office.

Consultation History

The southwestern willow flycatcher technical team is associated with the Virgin River Recovery Program, and comprised informally of members from the local RC&D, Farm Bureau, Environmental Defense, private landowners, Utah Division of Wildlife Resources, Natural Resources Conservation Service (NRCS), Utah State University Extension, the Bureau of Land Management, and the Service. One focus of this group is to work with private landowners to conserve and enhance southwestern willow flycatcher habitat. As such, in January 2007 Environmental Defense agreed to draft an umbrella safe harbor agreement for the flycatcher. Drafts were circulated among technical team members between March – October 2007 and discussed during technical team meetings in the same timeframe. The Program Administrator submitted an application for a 10(a)(1)(A) Enhancement of Survival Permit on September 17, 2007. The Notice of Availability of the proposed umbrella safe harbor was published in the Federal Register on May 7, 2008 (73 FR 28764).

BIOLOGICAL OPINION

Description of Proposed Action

The proposed action, covered by this document is the issuance of a Section 10(a)(1)(A) Enhancement of Survival permit (Permit) in conjunction with the implementation of a Programmatic Safe Harbor Agreement (Agreement) on non-federal lands in Washington and Kane counties, Utah within the historic range of the endangered southwestern willow flycatcher

(see attached map). The purposes of the Agreement are (1) to promote the conservation of the southwestern willow flycatcher through the voluntary restoration, enhancement, and management of native riparian habitat in southwestern Utah, (2) to provide certain regulatory assurances to landowners participating in such restoration, enhancement, and management activities, and (3) to accomplish the foregoing without negatively affecting farming and ranching activities. The properties eligible for enrollment under this Agreement consist of non-Federal lands in the aforementioned counties, which are hereafter made subject to Cooperative Agreements between the owners or managers thereof (Program Participants) and the Program Administrator (see Exhibit 1- Cooperative Agreement). The enrolled properties are to be more precisely indicated on maps attached to each Cooperative Agreement developed under this umbrella agreement (Exhibit A).

The southwestern willow flycatcher is the only "covered species" in the programmatic safe harbor agreement, as defined in the Service's final Safe Harbor Policy (64 Federal Register 32717); however, this Biological Opinion also evaluates associated impacts to the endangered Virgin River chub and woundfin, and the western yellow-billed cuckoo, a candidate species.

Current and recent land use practices on the enrolled properties are likely to be varied, including grazing, crop production, and other agricultural uses, as well as recreational uses. The conservation measures that will occur on the "enrolled properties" are expected to create a net benefit for the flycatcher.

Participation from private landowners is voluntary. Each participating landowner (Program Participant) must sign and agree to the terms specified in the Programmatic Agreement (see Exhibit 1, Cooperative Agreement). The Program Administrator will coordinate with the Service and the Utah Division of Wildlife Resources (UDWR) on all conservation measures and take associated with the individual Cooperative Agreements.

Under the Agreement, the Program Administrator will work with the Program Participants to develop Cooperative Agreements to restore, enhance, and manage native riparian habitats in southwestern Utah. Upon review and approval of the Cooperative Agreements by the Service, the RC&D Council will issue Certificates of Inclusion to private landowners.

A full description of the specific proposed actions will be found in the Cooperative Agreements for each landowner. Each Cooperative Agreement shall specify the individual conservation measures and management activities to be carried out on the enrolled property to which it applies and a timetable for implementing those activities. The Program Administrator will ensure management activities are carried out as described in each Cooperative Agreement and that all reporting requirements are completed. The Cooperative Agreements shall be effective upon the signing thereof by the Program Participant and the Program Administrator.

The Program Administrator shall develop for each enrolled property, and append to each Cooperative Agreement, a plan that specifies the habitat restoration, enhancement, and management activities to be carried out on the enrolled property and a timetable for implementing those activities. Activities may be partially funded by NRCS under existing or future legislative authorities. Activities under the Cooperative Agreements which are intended to

restore, enhance, and manage native riparian habitats in southwestern Utah shall include one or more of the following:

- Planting native vegetation associated with flycatcher breeding habitat that is appropriate for the site, such as native trees (i.e., cottonwoods), shrubs (i.e., willows, alders), and herbaceous plants (i.e., grasses and forbs).

- Installing or constructing fencing, livestock watering facilities, and stream crossings to exclude or control use of the riparian area by livestock.

- Implementing prescribed grazing management to adjust grazing periods, or stocking rates to meet the desired objectives of the plant community.

- Controlling or removing nonnative vegetation, such as tamarisk, Russian olive, or herbaceous weeds, provided that its removal is done as part of a restoration effort to replace the nonnative species with native species.

- Restoring or enhancing the physical and biological functions of the stream to provide available habitat for aquatic species and to provide morphological characteristics required to sustain riparian plant communities by 1) Restoring channel widths; 2) Improving floodplain-to-channel connectivity; 3) Installing in-stream structures to control direction, rate, and/or level of water in the floodplain; 4) Removal of dams, dikes, or levees; and other means such as the use of bioengineering techniques.

- Restoring floodplain wetlands to provide desired conditions of slow-moving water, saturated soils, and other conditions enabling the establishment of wetland and riparian plant communities.

Each restoration plan within the Cooperative Agreements will be to designed to provide either (1) sufficient available flycatcher habitat on the enrolled property capable of supporting a breeding pair of flycatchers if sufficient habitat for that purpose does not already exist, (2) sufficient available flycatcher habitat capable of supporting one or more additional breeding pairs of flycatchers if sufficient habitat to support at least one pair currently exists, or (3) improved quality of flycatcher habitat by removing nonnative vegetation and replacing it with native vegetation.

The Program Administrator will ensure management activities prescribed in the Cooperative Agreement are carried out as described and that all reporting requirements are completed. Emergency situations, such as flood, drought, wildfire, disease, or other unforeseen circumstances may require management actions not specified in the Cooperative Agreement. In these situations, the Parties acknowledge that it may be impossible to provide the 90-day notice required by Section 6 of the Cooperative Agreement prior to initiation of activities that could result in take of the covered species. However, the Program Administrator will immediately notify the Service of such a situation and implement actions as described in Section 10 of the Cooperative Agreement.

Occupied flycatcher habitats existing on the properties at the time of enrollment are considered baseline and are fully protected under the Act. The Agreement and the Act's regulatory assurances would be applicable to flycatcher habitat created above and beyond baseline conditions through participation in the Agreement. Landowners may take their properties back to the baseline condition after the agreed term of at least 15 years.

The Safe Harbor Agreement becomes effective upon issuance by the Service of the 10(a)(1)(A) Permit described in the Programmatic Safe Harbor Agreement and will be in effect for a term of 50 years. As mentioned above, Cooperative Agreements developed pursuant to the Safe Harbor Agreement will be for a term of at least 15 years. Certificates of Inclusion issued under this permit will have a term of 10 years beyond the term of the Cooperative Agreement but in no event beyond 2058. This Safe Harbor Agreement and the Permit may each be extended by mutual written consent of the parties given prior to the date of expiration and in compliance with all applicable laws and regulations. The additional years of Permit duration in the Certificates of Inclusion beyond the term of the Cooperative Agreements is approximately the amount of time that the Program Participants' conservation measures are expected to benefit the flycatcher without further active management. This additional time will allow the Program Participants to continue routine ranching and farming operations without actively managing habitat for the covered species.

Other Responsibilities of the Parties

- The Program Administrator agrees to enter into Cooperative Agreements with Program Participants, in the form attached hereto as Exhibit 1, that specify in part the management activities to be undertaken on the enrolled land, require the Program Participant to give the Program Administrator advance notice of certain activities likely to reduce the amount of flycatcher habitat on the enrolled property, allow access to the enrolled property by the Program Administrator and the Service or their agents, and address the responsibilities of the Program Participants in the event of the transfer of ownership of the enrolled property or the termination of the Cooperative Agreement, all as set forth in further detail in Exhibit 1. In addition to entering into Cooperative Agreements with willing non-Federal landowners and managers, as described above, the Program Administrator agrees to:

    1) Annually, the Program Administrator, in cooperation with the Service and the Utah Division of Wildlife Resources, will ensure that surveys are carried out on the restored habitat of enrolled properties to assess the general condition of habitat, use of the habitat by the covered species, progress of the ongoing management activities, and the satisfaction of the Program Participant with the project. If flycatchers are observed in the course of such surveys, that observation will be noted. Such survey activities may be carried out on the Program Administrator's behalf by a qualified entity pursuant to an agreement with the Program Administrator and Program Participant;

2) Provide the Service with an annual report, due by December 31 of each year, in the form attached hereto as Exhibit 2; and,

3) Furnish the Service with copies of all draft Cooperative Agreements hereunder prior to executing them and refrain from executing any to which the Service has objected in writing within 15 days of receiving the draft Cooperative Agreement.

- In consideration of the foregoing, the Service agrees to:

1) Upon execution of the Agreement, issue to the Program Administrator a permit in accordance with Section 10(a)(1)(A) of the Act, and valid for a period of 50 years, authorizing take of the covered species as a result of implementing management activities specified in a Cooperative Agreement, or as a result of other lawful activities on enrolled properties after the management activities specified in such Cooperative Agreement have been initiated, provided that such taking shall be consistent with maintaining baseline conditions on the enrolled property.

2) Provide to the Program Administrator and Program Participants technical assistance, to the maximum extent practicable, when requested; and provide information on Federal funding programs.

SOUTHWESTERN WILLOW FLYCATCHER

Status of Species/Critical Habitat

Species/Critical Habitat Description

The southwestern willow flycatcher (*Empidonax traillii extimus*) is a small passerine bird associated with riparian habitats. This species was listed as endangered under the Act on February 27, 1995 (USFWS 1995). On October 19, 2005, 120,824 acres of critical habitat were designated for southwestern willow flycatcher across Arizona, New Mexico, California, Nevada, and Utah (USFWS 2005). Within Utah, critical habitat was designated along the Virgin River in Washington County.

The southwestern willow flycatcher is one of four currently recognized subspecies of the willow flycatcher (*E. trailli*) (Hubbard 1987; Unitt 1987; Sogge 2000; USFWS 2001b and 2002). The *E. t. extimus* subspecies was first described by Phillips (1948) and later re-evaluated and accepted as a subspecies by Unitt (1987) and Browning (1993).

The southwestern willow flycatcher is a small bird, approximately 15 centimeters (cm) (5.75 inches) long. It has a grayish-green back and wings, whitish throat, light grey-olive breast, and

pale yellowish belly. Two wing bars are visible; the eye ring is faint or absent. The upper mandible is dark, the lower is light.

The *E. t. extimus* is paler than the other willow flycatcher subspecies and also differs in morphological characteristics: e.g., wing:tail ratio, wing formula; and bill length (Unitt 1987 and 1997; Browning 1993; USFWS 2001b and 2002). These differences are difficult to distinguish and are not reliable characteristics for field identification. The characteristic song of willow flycatcher species is often referred to as a *"fitz-bew"*. Travis (1996) and Sedgwick (1998 and 2001b) suggest that clinal variations in willow flycatcher songs also serve to distinguish between subspecies, but this too is unreliable as a definitive field identification tool. In southern Utah, southwestern Colorado, and perhaps New Mexico, clinal gradations of the *E. t. extimus* and Great Basin/Rocky Mountain willow flycatcher (*E. t. adastus*) are thought to occur (USFWS 2002). Phillips et al. (1964) suggested that the *E. t. extimus* may be typical of lower elevations, and in northern parts of its range (including Utah), clinal gradation with the Great Basin subspecies may exist with increasing elevation and latitude. Recent research (Paxton 2000) concluded that the *E. t. extimus* is genetically distinct from the other willow flycatcher species. However, clinal gradation increases the difficulty of subspecies identification without genetic testing.

Life History and Population Dynamics

Male southwestern willow flycatchers generally arrive at breeding grounds first, with females typically arriving a week or two later. Males are usually monogamous, but polygamy has been recorded (Sogge et al. 1997). Nests are usually built within a week of pair formation. Egg-laying begins as early as May but typically occurs in mid-June. The female provides initial care of the nestlings, the role of the male increases with the age and size of the young. Young typically fledge at 12 to 15 days of age, usually between June and mid-August. Second clutches are common if the first attempt is unsuccessful. Territory size varies among the southwestern willow flycatcher, probably due to differences in population density, habitat quality, and nesting stage.

Open, cup-shaped nests are typically constructed in the fork of a branch. Historically, most southwestern willow flycatcher nests (75-80%) were constructed in willows. Currently, the species nests in a variety of plant species, including exotic species such as tamarisk (*Tamarix ramosissima*).

Information on breeding site fidelity and persistence is limited. Studies of banded birds (Whitfield and Strong 1995; Whitfield and Enos 1996) report varying rates of nestlings returning to study sites to breed. Sogge and Tibbits (1994) reported the return of breeding populations to sites that had been unoccupied for several years, indicating that a habitat cannot be assumed unsuitable or unoccupied in the long term based on absence of southwestern willow flycatcher during a single year.

The southwestern willow flycatcher breeds in different types of dense riparian habitats across a large elevational and geographic area. Although the other willow flycatcher subspecies may breed in shrubby habitats away from water, the southwestern willow flycatcher breeds in patchy

to dense riparian habitats along streams or other wetlands, near or adjacent to surface water or underlain by saturated soil. Occupied southwestern willow flycatcher sites consist of dense vegetation in the patch interior that is generally 3 to 4 m (10 to 13 ft) above ground, or in aggregates of dense patches interspersed with openings. Saturated soil is present at or near the breeding site during wet or non-drought years (Sogge et al. 1997, Sogge and Marshall 2000, USFWS 2001b and 2002). Rangewide, common tree and shrub species comprising nesting habitat include willows (*Salix* spp.), seepwillow or mulefat (*Baccaharis* spp.), box elder (*Acer negundo*), stinging nettle (*Urtica* spp.), blackberry (*Rubus* spp.) cottonwood (*Populus* spp.) arrowweed (*Tessaria sericea*), tamarisk or saltcedar (*Tamarix ramosissima*), and Russian olive (*Elaeagnus angustifolia*). Dominant plant species, size and shape of habitat patch, canopy structure, vegetation height, etc., vary widely across the *E. t. extimus*'s range. In Utah, the southwestern willow flycatcher is typically found in mixed native and exotic riparian species habitats, generally dominated by coyote willow (*S. exigua*), tamarisk and Russian olive (Johnson et al. 1999a and 1999b).

Status and Distribution

The breeding range of the southwestern willow flycatcher includes southern California (from the Santa Ynez River south), Arizona, New Mexico, southwestern Colorado, southern portions of Nevada and Utah, and western Texas (Sogge et al. 1997, USFWS 2002). The Recovery Plan (USFWS 2002) divides the southwestern willow flycatcher's breeding range into six Recovery Units, which are subdivided into Management Units. Recovery Units are defined based on large watershed and hydrologic units; standardized boundaries of river basin units within the U.S. Within each of the six Recovery Units, multiple Management Units are delineated based on a geographic area representing all or part of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature. The outer limits of both the Recovery Unit and Management Unit boundaries are defined by the southwestern willow flycatcher's range (USFWS 2001b and 2002).

The State of Utah falls within both the Lower Colorado and Upper Colorado Recovery Units. The Upper Colorado Recovery Unit covers much of the four-corners area of southern Utah, southwestern Colorado, northeastern Arizona, and northwestern New Mexico. The northern boundary of the Upper Colorado Recovery Unit is delineated by the northern range boundary of the southwestern willow flycatcher. Ecologically, this region may be an area of clinal gradation between the southwestern willow flycatcher and the Great Basin willow flycatcher. The Lower Colorado Recovery Unit is a geographically large and ecologically diverse Recovery Unit, encompassing the Colorado River and its major tributaries, from Glen Canyon Dam downstream to the Mexico border (USFWS 2001b and 2002). Little specific information is known about migration and wintering ecology of the southwestern willow flycatcher (Yong and Finch 1997, Finch et al. 2000). Willow flycatchers (all subspecies) breed in North America, but winter in Mexico, Central America, and possibly northern South America (Phillips 1948, Stiles and Skutch 1989, Ridgely and Tudor 1994, Howell and Webb 1995, Sogge et al. 1997).

As previously discussed, recent genetic work (Paxton 2000) verified *E. t. extimus* genetic stock in the San Luis Valley of south-central Colorado and the Virgin River in Utah. Paxton's (2000; as cited in USFWS 2002) research showed that the northern boundary for southwestern willow

flycatcher was generally consistent with that proposed by Unitt (1987) and Browning (1993), and subsequently used in the Final Recovery Plan (USFWS 2002). Paxton's (2000) research further illustrated that the willow flycatcher in central Utah does not have the genetic markers of *E. t. extimus* and is more closely related to *E. t. adastus*. However, because of the absence of flycatchers in the lower- to mid-elevations of the Colorado Plateau in southern Utah and southwestern Colorado, Paxton (2000; as cited in USFWS 2002) did not address potential sub-specific differences resulting from elevation or habitat differences and watershed boundaries. Analysis of willow flycatcher vocalizations in central Utah also suggests association with *E. t. adastus*. The Final Recovery Plan (USFWS 2002) adopts a range boundary that reflects Paxton's (2000) and Sedgwick's (2001) results; the northern extent of southwestern willow flycatcher is confined to the southern portions of Utah. In the Recovery Plan, the USFWS acknowledges that new data may result in refinements to the northern range boundary currently recognized (USFWS 2002). This is based on the limited genetic information in portions of central and eastern Utah, particularly along major drainages including the Colorado and Green Rivers. Therefore, the USFWS Utah Field Office considers potential distribution for southwestern willow flycatcher to extend further north than the Recovery Plan boundary.

The reasons for the decline of the southwestern willow flycatcher and current threats to its conservation are numerous, complex and inter-related (USFWS 2001b, 2002). The major factors threatening the species include habitat loss and modification; invasion of breeding habitats by exotic plant species; brood parasitism by brown-headed cowbirds (*Molothrus ater*); the vulnerability of small southwestern willow flycatcher population numbers; and stresses that occur to the species during migration and in wintering habitats. These factors vary in severity over the southwestern willow flycatcher's range, and several are likely to have cumulative and synergistic effects (USFWS 1997).

For more information regarding the life history and population dynamics, see the Final Recovery Plan for the Southwestern Willow Flycatcher (USFWS 2002).

Environmental Baseline

Status of the Species Within the Action Area

This programmatic Safe Harbor Agreement falls within the historic range of the flycatcher on all non-federal lands within Washington and Kane Counties, Utah.

The known numbers of southwestern willow flycatcher breeding sites in Utah is 3 (K. Day, UDWR, pers. comm. 2007; Sogge et al. 2003), located on the Virgin River in Washington County. There are potential breeding pairs in the Paria and Kanab Creeks, however breeding status is not confirmed (Frank Howe, Non-Game Biologist, Utah Div. of Wild. Res., pers. comm. 2005). The San Juan River also has potential breeding pairs, but again this has not been confirmed (Frank Howe, Non-Game Biologist, Utah Div. of Wild. Res., pers. comm. 2005). The survey protocol requires three positive surveys to confirm breeding in a particular area. However, breeding birds may not vocalize during the third survey and therefore may be missed. Migratory habitats are also important for the species. For more information regarding the range

and potential habitat in Utah, see the Final Recovery Plan for the Southwestern Willow Flycatcher (USFWS 2002).

Factors Affecting the Species Environment Within the Action Area

Southwestern willow flycatchers may have always been rare in southern Utah (Behle pers. comm. cited in Unitt 1987); however, where habitat existed along the Colorado River and its tributaries in southeastern Utah, it was thought to be a locally common breeding and migratory resident (Behle and Higgins 1959). Recent surveys conducted by Sogge et al. (2003) and Durst et al. (2005) have found a few breeding locations and territories in southern Utah. Little population trend data are available in Utah. However, loss and modification of habitat is likely to have reduced populations on the Virgin, Colorado, and San Juan rivers. These losses have been due to suburban expansion and habitat changes along the Virgin River, inundation by Lake Powell on the Colorado and San Juan rivers, and encroachment of tamarisk throughout the region (Unitt 1987, BLM unpublished data). Recent severe flood events in 2005 also resulted in lost habitat along the Santa Clara and Virgin Rivers.

Floodplains and associated riparian vegetation were once dominated by a wide band of trees, principally cottonwood and willows (Horton 1977). Arrowweed and mesquite were dominant in many upland areas (Horton 1977). Graf (1982) reports that tamarisk was introduced into the United States in the early 1800s and into the American Southwest by 1856. From 1925 through 1960, tamarisk rapidly spread throughout Utah with the greatest degree of invasion occurring from 1935 to 1955 (Christensen 1962). Tamarisk changes channel morphology from braided, shallow systems to ones that are constrained, centralized, and deeper. Dense tamarisk vegetation reduces the channel capacities of normal flow events and has been cited as the cause of disastrous flooding (Graf 1982). Southwestern willow flycatcher habitat may be very vulnerable to the changes tamarisk invasion brings about in stream morphology and ecology. The effects of tamarisk to breeding southwestern willow flycatchers may not be as apparent as the effects to their habitat. Owen and Sogge (2002) studied 12 parameters of physiological condition of 130 southwestern willow flycatchers in native vegetation and tamarisk and found no evidence that flycatchers breeding in tamarisk exhibit poorer nutritional condition or are suffering negative physiological affects. However, breeding success and the number of species supported within a tamarisk stand is reduced (Anderson et al. 1977).

Enrolled Property Baseline Determinations

For each enrolled property, the Program Administrator shall specify the baseline conditions based upon a survey for flycatchers on the enrolled property, conducted by a qualified person satisfactory to the Service and according to Service protocol (see below), not more than 12 months prior to the signing of the Cooperative Agreement. Note that the protocol requires that surveys be conducted during the breeding season (May 1 – August 15). If flycatchers are detected during a baseline survey, the baseline is the amount of available flycatcher habitat (see below) present on the property; if no flycatchers are detected, the baseline is zero.

The protocol used to determine the presence or absence of flycatchers shall be: Sogge, Mark K., R.M. Marshall, S.J. Sferra, and T.J. Tibbitts: A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol. Technical Report NPS/NAU cprs/NRTR-97/12. May 1997.

http://sbsc.wr.usgs.gov/cprs/research/projects/swwf/protocol.asp. If there are updates or changes to the protocol in the future, the most current protocol will be implemented.

If southwestern willow flycatchers are detected during baseline surveys, "available flycatcher habitat" shall include streams and standing open water areas and all riparian vegetation including seep willows *(Baccharus sp.*), arrowweed (*Pluchia sp.*), saltbush (*Atriplex sp.*), mesquite (*Prosopis sp.*), acacia (*Acacia greggii*), desert willow (*Chilopsis linearis*), tamarisk (*Tamarix spp.*), Russian olive (*Elaeagnus angustifolia*), Salix willows (*Salix sp.*), ash (*Fraxinis sp.*), box elder (*Acer negundo*), and cottonwood (*Populus sp.*). Total acreage of flycatcher habitat shall be determined by mapping the area of open and flowing water (i.e., ponds, streams, marshes, etc.) and all riparian vegetation patches existing on the property prior to the initiation of the project.

In order to receive the assurances regarding take of covered species specified in Section 10 hereof, a Program Participant must maintain on the enrolled property at least as much available flycatcher habitat as was occupied by flycatchers when the Program Participant entered into the program.

WESTERN YELLOW-BILLED CUCKOO

Status of Species/Critical Habitat

Species/Critical Habitat Description

The western continental United States distinct population segment of the yellow-billed cuckoo (western yellow-billed cuckoo) is a candidate species under the Act (Service 2001a). In response to a petition to list the species submitted in February 1998, on July 25, 2001, the Service issued a 12-month "warranted but precluded" finding.

The yellow-billed cuckoo is a medium-sized, slender bird (about 12 inches in length and weighing about 2 ounces) of the Family Cucilidae, whose members are characterized in part by zygodactyl feet (with two toes pointing forward and two backward). The species has a slender, long-tailed profile, with a fairly stout and slightly down-curved bill that is blue-black with yellow on the base of the lower mandible. Plumage is grayish-brown above and white below, with rufous primary flight feathers. The tail feathers are boldly patterned with black and white below. The legs are short and bluish-gray, and adults have a narrow, yellow eye ring. Juveniles resemble adults, except the tail patterning is less distinct, and the lower bill may have little or no yellow. Males and females differ slightly, as males tend to have a slightly larger bill.

Life History and Population Dynamics

The western yellow-billed cuckoo is associated primarily with cottonwood-willow dominated riparian habitats (Gaines 1974, Gaines and Laymon 1984, Laymon and Halterman 1987, 1989, 1990; Halterman 1991; Halterman and Laymon 1994, 1995). Cottonwood-willow is the predominant and preferred habitat, but very tall screwbean-honey mesquite stands are also used. In addition, yellow-billed cuckoos have been found to use a mixture of saltcedar and cottonwood/willows (Corman and Magill 2000). Gaines (1974) found that vegetation density, distance to water, and the length and width of the habitat area were important characteristics

when surveying for cuckoos. Western yellow billed cuckoos breed in large blocks of riparian habitats (particularly woodlands with cottonwoods and willows). Dense understory foliage appears to be an important factor in nest site selection, and cottonwood trees are an important element of foraging habitat in areas where the species has been studied in California (Halterman 1991).

The yellow-billed cuckoo arrives on the breeding grounds beginning in mid- to late May (Franzreb and Laymon 1993). Nesting activities usually take place between late June and late July, but may begin as early as late May, and continue to late August, depending on the season. Nest building takes 2-4 days. Nests are typically built in willow or mesquite thickets 4 to10 feet (but as high as 35 feet) above the ground, are usually well-hidden by foliage, and are almost always near water. Incubation begins as soon as the first egg is laid, and lasts 11 days. Clutch size is usually two or three eggs, and development of the young are very rapid, with a breeding cycle of 17 days from egg-laying to fledging young. The young are fed large food items such as green caterpillars, tree frogs, katydids, and grasshoppers for the 6-7 day nestling period. After fledging the young are dependent on the adults for at least 2 weeks.

Status and Distribution

Based on historic accounts, the western yellow-billed cuckoo was widespread and locally common in California and Arizona, locally common in a few river reaches in New Mexico, locally common in Oregon and Washington, generally local and uncommon in scattered drainages of the arid and semiarid portions of western Colorado, western Wyoming, Idaho, Nevada, and Utah, and probably uncommon and local in British Columbia.

In Utah, the species was historically uncommon to rare along river bottoms. There are at least two recent breeding records (Ouray National Wildlife Refuge on the Green River, and the Matheson Wetland Preserve near Moab) and reports from at least five other areas where breeding has been suspected. Recent avian surveys of riparian habitats within the historic range (the Salt Lake Valley) recorded three cuckoos in 7,000 survey hours.

Threats to yellow-billed cuckoos and their habitat in Utah include habitat loss and fragmentation from flooding and dewatering, encroachment by nonnative salt cedar, grazing, and oil and gas development. Management of flow regimes was also identified as a major impact on cuckoo habitat with extremely high flows removing habitat and extended periods of low flows likely drying up yellow-billed cuckoo habitat which could result in the loss of suitable habitat and invasion by salt cedar. Additionally, cattle grazing was identified as a possible threat to patches of yellow-billed cuckoo habitat by contributing to the loss of subcanopy vegetation and cottonwood regeneration by grazing and trampling. Another potential threat to yellow-billed cuckoo habitat was attributed to recreational impacts by river users (e.g., use of cottonwood stands for campsites and “lunch spots”). The Utah Division of Wildlife Resources stated that the yellow-billed cuckoo is threatened by habitat loss from agricultural, water, road and urban development, and has declined significantly across its range. (USFWS 2001a)

Environmental Baseline

Status of the Species Within the Action Area

This programmatic Safe Harbor Agreement falls within the historic range of the flycatcher on all non-federal lands within Washington and Kane Counties, Utah. This area overlaps with cuckoo habitat within the action area.

The Utah Division of Wildlife Resources has surveyed for this species in southwestern Utah for several years. A probable breeding pair was seen behind the Dixie Center 5 years ago. A single bird was seen upstream of the town of Santa Clara 3 years ago. Other riparian areas contain suitable habitat and are at least used during migration, if not breeding. Additional breeding sites may exist on private property not accessible to survey. (Keith Day, Non-Game Biologist, Utah Div. of Wild. Res., pers. comm., May 2005)

Factors Affecting the Species Environment Within the Action Area

As mentioned previously, threats to yellow-billed cuckoos and their habitat include habitat loss and fragmentation from flooding and dewatering, encroachment by nonnative tamarisk, grazing, oil and gas development, and recreational impacts.

As explained in the flycatcher section above, tamarisk changes channel morphology from braided, shallow systems to ones that are constrained, centralized, and deeper. Dense tamarisk vegetation reduces the channel capacities of normal flow events and has been cited as the cause of disastrous flooding (Graf 1982).

Effects of the Action to Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo

The objectives of this Agreement are to: (1) to promote the conservation of the southwestern willow flycatcher, through the voluntary restoration, enhancement, and management of native riparian habitat in southwestern Utah, (2) to provide certain regulatory assurances to landowners participating in such restoration, enhancement, and management activities, and (3) to accomplish the foregoing without negatively affecting farming and ranching activities. Based on these objectives, the proposed project is anticipated to benefit the flycatcher and create associated beneficial impacts to the cuckoo by increasing and improving the habitat available to them, creating an opportunity to increase their numbers, and providing assurance against the loss of the species in the area as a result of habitat loss or other factors elsewhere. Therefore, return of the enrolled properties to baseline will not affect the net conservation benefits or contributions towards the enhancement and survival of the flycatcher provided by this Agreement and individual Cooperative Agreements.

The Service has determined that implementation of this Agreement is reasonably expected to provide a “net conservation benefit” to the covered species, flycatcher. The basis for the Service’s determination is as follows:

> Breeding southwestern willow flycatchers are at a very high risk of extirpation from Utah. Only three breeding sites, occupied by a total of seven breeding territories, are

known to occur in Utah, all of which are found along the Virgin River in Washington County. Small sites with five or fewer breeding territories are at the greatest risk of extirpation. Throughout the flycatcher's range, 265 breeding sites have been tracked since 1993, of which 122 no longer support breeding territories. Of these 122 sites that no longer support breeding flycatchers, 120 (98%) were small sites with 5 or fewer territories, underscoring the vulnerability of the few sites in Utah. The management activities performed by the Program Participants pursuant to this Agreement are expected to increase the likelihood of the flycatcher's persistence in Utah by increasing or improving the quality and quantity of breeding habitat for it during the term of this Agreement.

A recovery plan was completed in 2002, focusing recovery actions on conserving and restoring native riparian habitats in an effort to increase the number of flycatcher populations and decrease the distance between populations. One goal of the Recovery Plan is to increase the number of known flycatcher territories. Habitat conservation and restoration is one method of potentially increasing the number of territories across the landscape. Because this is an umbrella document, we can not specify the actual acreage of habitat that will be restored or the number of territories we may be able to increase. However, all management activities in this agreement are consistent with Recovery Actions described by the Recovery Plan, and will support long-term conservation efforts.

The Agreement supports recovery through development and implementation of site-specific management plans for the restoration and management of riparian habitat. Specific recovery actions addressed in the Agreement are: 1) to "increase and improve occupied, available, and potential breeding habitat," 2) to increase metapopulation stability, and 3) to "assure implementation of laws, policies, and agreements that benefit the flycatcher," in the Recovery Plan for the flycatcher by developing and implementing site-specific management plans for the restoration and management of riparian habitat.

Critical habitat for the southwestern willow flycatcher was designated in 2005. The Virgin River in Washington County, Utah, from the State line to the Washington Fields Diversion was included in the critical habitat designation. Eighty-three percent of the riparian habitat along this river reach is privately owned. Conservation and recovery of the southwestern willow flycatcher along the Virgin River, Utah, will depend on engaging willing private landowners in conservation efforts.

Although the long-term effects of these projects result in conservation benefits for both the flycatcher and the cuckoo, short-term adverse effects to flycatchers and cuckoos could occur in association with habitat restoration, enhancement, and management activities to be carried out on the enrolled properties. Planting native vegetation to enhance flycatcher and cuckoo breeding habitat or controlling or removing nonnative vegetation, as well as restoring the physical and biological functions of the stream and floodplain wetlands may increase human presence, equipment and vehicle use (including associated noise disturbances), vegetation treatment disturbance, and surface disturbance. Associated noise disturbances may adversely affect the behavior of southwestern willow flycatchers and western yellow-billed cuckoos during breeding, nesting, or foraging activities. Vegetation disturbances, vegetation removal, or chemical

treatment of vegetation may adversely affect availability of nesting habitat, cover from predators, prey and prey habitat, and adversely affect southwestern willow flycatcher and western yellow-billed cuckoo and their young. Soil disturbances may increase erosion, adversely affect soil stability, increase sediment deposits, and alter channel morphology.

As a result, of these disturbances, there may be decreases in nest initiation or nesting success. Prescribed grazing management may also alter vegetation composition, structure, and nutritive quality as well as result in short-term fragmented habitat and adversely affect availability of nesting habitat, cover from predators, prey habitat for flycatchers and cuckoos, and alterations of water distribution within occupied habitat for southwestern willow flycatcher and western yellow-billed cuckoo. Although some activities, such as vegetation management; grazing management; fencing and exclosure construction; channel width restoration; in-stream structure installation; and dam, dike or levee removal may cause short-term adverse impacts, they will, if conducted in association with this safe harbor agreement, result in long-term benefits. In general, long-term efforts to improve the health and availability of riparian habitats will benefit southwestern willow flycatcher and western yellow-billed cuckoo by increasing nesting success, increasing insect prey abundance, and decreasing predation. While potential short-term adverse effects to flycatchers and cuckoos may be associated with the proposed actions, this programmatic Safe Harbor Agreement will result in a net conservation benefit to both flycatchers and cuckoos and will contribute to the enhancement and survival of these species.

VIRGIN RIVER CHUB AND WOUNDFIN

Status of Species/Critical Habitat

Species/Critical Habitat Description

Virgin River Chub

The Virgin River chub (*Gila seminuda*) was proposed for listing as endangered, with critical habitat, on August 23, 1978 (43 FR 37668). On September 30, 1980, the proposal was withdrawn because the 1978 amendments to the Act required that all proposals pending for more than two years be withdrawn (45 FR 64853). The Virgin River chub was re-proposed as endangered, with critical habitat, on June 24, 1986 (51 FR 22949). On August 24, 1989, the Virgin River chub was listed as endangered (54 FR 35305) throughout its entire range (50 CFR 17.11) but critical habitat was not designated at that time. When the Virgin River chub was listed it was considered a subspecies of roundtail chub (*G. robusta*) and its taxonomic classification was *G. robusta seminuda*. At the time of listing in 1989, chubs in the Muddy River were considered a separate unnamed subspecies, *G. robusta spp*., commonly referred to as Moapa roundtail chub. Although the Muddy River population had also suffered population declines and a reduction in range, the Service did not include this population in the listing of the Virgin River chub.

DeMarais et al. (1992) asserted that full species status was warranted for the Virgin River chub and reclassified it as *Gila seminuda*. The Moapa roundtail chub was also included as *G. seminuda* by DeMarais although he recognized it as a distinctive population geographically

isolated from the Virgin River population by Lake Mead. On July 24, 1995, a proposed rule was published in the Federal Register (60 FR 37866) proposing a change in rank from subspecies to species for the Virgin River chub, and proposing a change in the status of the Virgin River population of Virgin River chub from a subspecies to a vertebrate population segment and providing notice of a status review of the Virgin River chub in the Muddy River to determine if this vertebrate population segment warrants listing.

The Virgin River chub is a silvery minnow reaching 8 to 18 inches (20 to 45 cm). The Virgin River chub can be distinguished from subspecies of roundtail chub (*G. robusta*) by the number of rays (9 to 10) in the dorsal, anal, and pelvic fins, and the number of gill rakers (24 to 31). The species name *seminuda* refers to the small, deeply imbedded scales on the back, breast and portions of the belly. They are difficult to see and may in fact be absent in some individuals.

Woundfin

The woundfin was listed as endangered on October 13, 1970 (35 FR 16047). Subsequent to listing, critical habitat was originally proposed on November 2, 1977 (42 FR 57329). The proposal was withdrawn because the 1978 amendments to the Act required that all proposals pending for more than two years be withdrawn (45 FR 64853). A Woundfin Recovery Plan was developed and approved in July 1979 and later revised and updated in March 1984. In 1995, this plan was superseded by the Virgin River Fishes Recovery Plan, which included both the woundfin and the Virgin River chub.

Critical habitat was proposed and finalized at the same time for both the Virgin River chub and the woundfin. Critical habitat for both fish species is identical and was designated on January 26, 2000 (65 FR 4140). Designated critical habitat includes 140.1 km (87.5 mi) of the Virgin River and its associated 100-year flood plain, extending from the confluence of La Verkin Creek, Utah, to Halfway Wash, Nevada. It includes 59.6 km (37.3 mi) of the mainstem Virgin River in Utah, 50.6 km (31.6 mi) in Arizona, and 29.9 km (18.6 mi) in Nevada. Of the 140.1 km of designated critical habitat, 57.7 percent is federally owned, 39.9 percent is privately owned, and 2.4 percent is state owned. Based upon earlier records, the historic range of woundfin extended from near the junction of the Salt and Verde Rivers at Tempe, Arizona, to the mouth of the Gila River at Yuma, Arizona (Gilbert and Scofield 1898). Woundfin were also likely found in the mainstem Colorado River from Yuma (Jordan and Evermann 1896; Meek 1904; Follett 1961) upstream to the Virgin River in Nevada, Arizona, and Utah, and into La Verkin Creek, a tributary to the Virgin River in Utah (Gilbert and Scofield 1898; Snyder 1915; Miller and Hubbs 1960; Cross 1975). Based on biological considerations, it is also believed that woundfin occurred further upstream on the Verde, Salt, and Gila Rivers in Arizona. The designation of critical habitat for this species represents approximately 12.5 percent of its historical range. Virgin River chub historically were collected within the Muddy River in Nevada and within the mainstem Virgin River from Pah Tempe Springs, Utah, downstream to the confluence with the Colorado River in Nevada (Cope and Yarrow 1875, Cross 1975). The designation of critical habitat for this species represents approximately 65.8 percent of its historical habitat within the Virgin River basin. The primary constituent elements of critical habitat determined necessary for the survival and recovery of these Virgin River fishes are water, physical habitat, and biological

environment. The final rule (65 FR 4140) provides a detailed description of designated critical habitat and is incorporated by reference into this document.

The woundfin is a streamlined, silvery minnow with a flat head and a conspicuous sharp dorsal spine, from which its common name was derived. The woundfin is the most silvery of all American minnows (Miller and Hubbs 1960), reflecting blue in bright sunlight. The only breeding color noted has been a wash of light yellow at the bases of the pectoral and pelvic fins. The species rarely achieves a standard length of more than 7.5 cm (3 in).

The head and belly of the woundfin are flattened, and the overall aspect of the fish is one of an anteriorly depressed, streamlined torpedo. This body shape is characteristic of fish inhabiting swift, shallow, sand-bottomed streams. Other adaptations to this type of habitat (Moore 1950; Branson 1963, 1966; Cross 1967) include expansive, falcate fins, barbels on the lips, reduced eyes, and extensive sensory buds, which may be chemoreceptors, on the lower part of the head (the gular region in woundfin) (Snyder 1915) and along the leading pectoral fin-rays. Woundfin are essentially scaleless, with the exception of small plates of bone situated in the leathery skin, especially near the nape. Adaptive features unique to the woundfin include a modification of the two anterior fin-rays of the dorsal fin into enlarged, elongated, and solidified spinose rays, the second of which fits into a groove in the first. Also, the branched pelvic rays are thickened and spine-like on the basal half to three-fourths of each ray. A further specialization in woundfin is a spine-like development near the base of the first few pectoral fin-rays.

Life History and Population Dynamics

Virgin River Chub

Virgin River chub is most often associated with deep runs or pool habitats of slow to moderate velocities with large boulders or instream cover, such as root snags. Adults and juveniles are often associated together within these habitats; however, the larger adults are collected most often in the deeper pool habitats within the river. Hardy et al. (1989) determined that Virgin River chubs were most often collected in depths ranging from 0.18 m (0.6 ft) to 0.91 m (3.0 ft) in velocities ranging from 0.0 to 0.76 m/sec (0.0 to 2.5 ft/sec) and associated over sand substrates with boulders or instream cover. Schumann (1978) and Deacon et al. (1987) found that the final adult thermal preferendum was approximately 24 ^{0}C (75 ^{0}F).

Virgin River chub is omnivorous, showing considerable dietary shifts with age. Young fish feed almost entirely on macroinvertebrates while adults feed almost exclusively on algae and debris (Greger and Deacon 1988). Cross (1975) reported that up to 90 percent of the diet consisted of filamentous algae.

Until recently, very little was known about the population dynamics of this species, including reproductive biology, population size, and variability. However, spawning is known to occur in the spring, and ripe females have been reported during the months of April, May and June (Hickman 1987). Hickman (1987) also noted that good spawning years coincided with good spawning years for woundfin. It is likely that Virgin River chub live for many years, perhaps for

decades, but they mature rapidly and probably spawn in their second or third year of life (Williams and Deacon 1998).

Woundfin

Adult woundfin are often collected from runs and quiet waters adjacent to riffles. Larvae are found in backwaters or slowly moving water along the stream margin, and often are associated with dense growths of filamentous algae. Juveniles use habitats that are slower and deeper than those characteristic of adults. Woundfin greater than 1.6 inches total length are collected most frequently at depths between 0.48 and 1.4 feet, in current velocities ranging from 0.78 to 1.6 feet per second, over sand and sand-gravel substrate (Hardy et al. 1989). There is some indication that when water clarity is high, adult woundfin move into deeper water (Hardy, unpubl. field notes). The critical thermal maximum temperature for woundfin in the Virgin River is about 39^0C (102^0F) with mean preferred temperatures of about 11 to 24^0C (52 to 75^0F), depending on the overall stream temperature (Deacon et al. 1987). Woundfin feed on a variety of items, including filamentous algae, detrital material, seeds, and aquatic insects (Cross 1975; Winget and Baumann 1977; Greger and Deacon 1988); displaying a seasonal shift in food selectivity. Dietary overlap with introduced red shiners is greatest when food is most abundant. During periods of lower food abundance, woundfin and red shiners may experience greater competition for food, leading to a more pronounced partitioning of the food niche (Greger and Deacon 1988).

Historically, ripe females were identified in the Virgin River during March, April, and May (Peters 1970). Spawning has been documented from April to August (Hickman 1987; Hardy et al. 1989). Larvae have appeared in May through August, showing up earlier in the year in the lower river than in the upper river (Cross 1975; Deacon 1977, 1979), suggesting that temperature may play an important role in reproductive timing. Spawning was observed to occur in an artificial stream environment at temperatures of 20 to 25^0C (68 to 77^0F) (Greger and Deacon 1982). Spawning activity in the Virgin River during 1977 was observed near Mesquite in April at a water temperature of 15^0C (59^0F). Young first appeared that year in early June. In the upper river during that same year, young first appeared in late July (Deacon 1977, 1979).

Males were observed to school in swift flowing water at depths of 0.23 to 0.33 feet over cobble to gravel substrate in an artificial stream environment. Single females entered the area from deeper water and then joined a group of males for spawning (Greger and Deacon 1982). Woundfin are thought to use almost any substrate for spawning. Hickman (1987) noted that gravid females in the Virgin River congregate in deeper water adjacent to riffle habitat during the spawning season. Maturation appears to occur at one year of age in the second summer, and few if any individuals live more than four years (Minckley 1980).

Deacon (1977, 1979, 1988), Deacon and Hardy (1984), and Gregory and Deacon (1994) have attempted to describe flow characteristics necessary for successful spawning, for recruitment of juvenile woundfin into the adult population, and for maintenance of relatively high woundfin population density. In general, recruitment is poorest when mean flows in April, May, and June are less than 100 cubic feet per second (cfs). Recruitment is most successful when spring flows range between 100 and 1000 cfs, and becomes more variable as flows exceed 1000 cfs. Recruitment is also more successful during years when mean monthly flows during spring runoff

decline from about 1000 cfs to 100 cfs. Percentages of juveniles in the population tend to increase when flows ranging from 290 and 820 cfs occur during the assumed month of their hatching and development of fry. Hatching and development of fry are associated with poorer recruitment at flows of less than 130 cfs, and is rarely successful at mean flows less than 64 cfs.

Status and Distribution

The historical range of the woundfin included rivers in Arizona, Nevada, and Utah, extending from near the junction of the Salt and Verde Rivers at Tempe, Arizona, to the mouth of the Gila River at Yuma, Arizona, and the Colorado River from Yuma, Arizona upstream to the Virgin River in Nevada, Arizona, and Utah, and into La Verkin Creek in Utah. Woundfin are extirpated from much of their former range, and are now confined to the mainstem Virgin River from Pah Tempe Springs and the lower portion of Ash and La Verkin Creeks downstream to Lake Mead. The current distribution of woundfin within the potential project area represents 57 percent of the total designated critical habitat for this species and 7 percent of its historical range.

UDWR monitoring efforts in 2007 found that Virgin River chub abundance declined by over 90 percent between 2006 and 2007 in the Utah portion of the Virgin River. Virgin River chub monitoring data supported data collected by other monitoring projects, including full pass distribution monitoring, showing that poor water quality during two late summer 2007 storm events had decimated the native fish population between Pah Tempe Hot Springs and Washington Fields Diversion. Thus, the Virgin River chub population is likely at its lowest level ever.

The woundfin is now critically imperiled in the Virgin River. Monitoring efforts by UDWR have determined that the same 2007 storm events that decimated Virgin River chub caused wild woundfin to be functionally extirpated from the Virgin River in 2007. At this point it remains unclear what factor, or combination of factors, may have resulted in the low dissolved oxygen levels responsible for these fish kills. Sluicing of a diversion structure occurred during these storms and may have contributed to low dissolved oxygen levels. Causes for this most recent decline in woundfin numbers was attributed to the following suite of environmental conditions: continued drought with summer temperatures exceeding behavioral thermal maximum and critical thermal maximum; runoff from burned portions of the drainage; and the input of sediment from behind the Quail Creek Diversion Dam. Hatchery raised woundfin were stocked in the upper Virgin River in fall 2007; additional releases are planned in the future.

Historically, in the upper Virgin River, the Hurricane and LaVerkin Ditch Diversions constructed in the late 1890's and early 1900's diverted Virgin River flows a short distance upstream of Pah Tempe Springs in LaVerkin, Utah. These diversions routinely dewatered the river downstream to Pah Tempe Springs under low flow conditions. Those structures remained in service until replaced by the Quail Creek Diversion in 1985. The Quail Creek pipeline capacity is approximately 125 cfs. These historical diversions and the current Quail Creek facilities had the capacity to periodically dry dam the Virgin River, however current operations maintain a minimum flow of 3 cfs (Lentsch et al. 1995). Water use in the upper river has not changed appreciably since the Quail Lake Project was completed in 1985.

A portion of the flow diverted at the Quail Lake Diversion is returned to the river at various locations downstream. The first release (approximately 25-30 cfs) occurs just downstream from Pah Tempe Springs at the upstream terminus of critical habitat. The Quail Lake Project operations require a minimum flow of 86 cfs (or the natural flow as measured at the Virgin River gage at Virgin, Utah if less than 86 cfs) to the Washington Fields Diversion. The entire flow of the river has been diverted near the present site of the Washington Fields Diversion periodically since the early 1900's through authorized water rights. The Virgin River Program is currently developing a flow recommendation for the river downstream of Washington Fields Diversion in conjunction with operations of a recently constructed fish screen at the head of the irrigation canal (USFWS 2005). Currently a minimum flow of 5cfs passes the Washington Fields Diversion through the operation of the fish screen. Irrigation returns restore a portion of the flow downstream of the diversion structure. The Virgin River channel is a "losing" reach downstream of the Utah stateline and may have dried periodically during pre-development times. Operations at the St. George City Water Treatment Plant downstream of Bloomington, Utah in concert with Quail Creek Reservoir operations have augmented summer base flows resulting in more frequent surface flow through the Gorge than occurred through much of the 1900's. Increased land development and residential irrigation has led to return flows in previously dry tributary streams and increased flow in the river. Whereas, flow augmentation in this portion of the system helps to support local fish communities, it has also been implicated in the upstream expansion of red shiner.

A series of springs beginning in the lower Virgin River Gorge and extending downstream through Littlefield, AZ maintain baseflows near 50cfs in the Virgin River near its confluence with Beaver Dam Wash. Three diversion structures in the lower 25 miles of the Virgin River capture substantial amounts of water during low flow periods: the Mesquite Diversion -30 to 40 cfs; the Bunkerville Diversion – 15 to 20 cfs; and the Riverside Diversion can take the bulk of the remaining streamflow. During the recent period of drought, resource managers reported flows in the Mesquite Bridge and Riverside Reaches at less than 20 cfs and at times 0-5 cfs (Golden and Holden 2004). There are only two short reaches of critical habitat that are not heavily impacted by water development: the area immediately above the Washington Fields Diversion; and the area extending from the lower Virgin River Gorge to the Mesquite Diversion.

Holden et al. (2001) showed that fall woundfin abundance was significantly lower in drought years than in non-drought years. Golden and Holden (2002) found the same relationship applied to other Virgin River native fishes as well. Additionally, fall woundfin abundance was significantly lower in years where summer 50% exceedence flows were below 75 cfs (Holden et al. 2001). Fall woundfin abundance declines even further at summer 50% exceedence flows below 50 cfs (Holden et al. 2001).

In addition to the obvious loss of habitat associated with diminished flow are effects associated with decreased turbidity and elevated summer temperatures. The effects of unnaturally low levels of turbidity are not completely understood, but appear to cause fish to crowd into habitats with cover, increasing competition for resources and predation). Researchers have shown that Virgin River fish experience physiological limitations and subsequent mortality at approximately 31°C (UDWR 2006). Deacon et al (1987) observed the loss of equilibrium in Virgin River fishes when exposed to 31°C and above, which he referred to as the critical thermal maximum

(CTM). CTM differ by species and acclimation conditions. Less well characterized but perhaps of equal concern is a temperature at which behavior is affected; a behavioral thermal maximum (BTM). Field observations in the Virgin River indicate that at temperatures in excess of 28°C native fish shift their behavior to seek out thermal refuge (deeper pools, groundwater inflows, etc) (Fridell and Morvilius 2005, Morvilius-Auer and Fridell 2006). The temperature in the above Washington Fields Diversion reach, particularly from Quail Creek Reservoir upstream to Pah Tempe Springs, can be very high during the summer (peak daily temperature above 35 °C, mean daily temperature greater than 29 °C) (Addley et al. 2005). Similarly in the lower river, Golden and Holden (2004) report that CTM is often exceeded at the Riverside area and can even be exceeded near Beaver Dam Wash where there are large influxes of groundwater.

Reducing the threat of future exceedence of BTM and CTM will require innovative water management strategies. In 2004, the WCWCD released approximately 10 cfs of cool water from their Kolob Reservoir from July 20 through the end of August. Those flows entered the river a short distance upstream of critical habitat. Fish sampling during fall 2004 indicated over-summer survival that year was better than had been observed in preceding low flow years (Fridell and Morvilius 2005). The Utah Water Research Lab has also provided preliminary design analyses on use of a flow back pipeline from Quail Creek to the confluence area that would extend the area of beneficial thermal influence now confined to below Stratton Pond. The Virgin River Program has identified the need to improve habitat quality through the critical summer period as a top priority. As a similar coalition is established in the lower river, protection of summer habitat conditions (even more problematical from a water management perspective) must be made a priority there as well.

An unquantified, but real threat to the Virgin River fish is their entrainment at water diversion structures throughout the Virgin River system. The Quail Creek Diversion takes the largest amount of water in the Virgin River system, but is located upstream of designated critical habitat for the endangered fish. The next diversion structure downstream, the Washington Fields Diversion, is the second largest in terms of depletion, and has the capability to dry dam the river. This diversion, which demarcates the downstream terminus of what was historically the largest remaining population of woundfin and Virgin River chub, was likely responsible for large losses of endangered fish annually. The Washington Fields Diversion was the first structure targeted for remediation. In 2005, the WCWCD, the Washington Canal Company and the Virgin River Program completed construction of a fish screen at the head of the irrigation canal, which shunts fish back to the Virgin River immediately downstream of the diversion structure (USFWS 2005). The construction of this fish screen and the restoration of perennial flow downstream of the Washington Fields Diversion is probably the most successful accomplishment and important recovery activity that has occurred to date in the Virgin River system. Entrainment of Virgin River fish at diversion structures farther downstream (Mesquite, Bunkerville, and Riverside) remains unresolved.

Tamarisk (*Tamarix ramosissima*) was introduced into the United States from central Asia in the 1830s to stabilize river banks, as a windbreak and as an ornamental plant. This nonnative has taken over the riparian zone/floodplain of the Virgin River system, especially in low gradient areas with sandy substrates. The tree is tolerant of drought, heat, cold, salinity, fire and flooding. Its roots extend deeper than many riparian plants, thus it can out compete other plants and grow

in areas where water is not readily available. The tree can sprout from roots or from branches. Tamarisk occurrences in the Virgin River drainage range from vast monotypic stands to individual trees interspersed within native vegetation, and also as isolated trees and stands in upland areas, where springs or moist soil conditions may be present. Tamarisk can dominate floodplain vegetation and can influence normal river function. Stream channels become restricted and flood flows may cut new channels due to the thick growth or because of tamarisk debris dams. The tree impacts native fish habitat and is less desirable for other wildlife such as mammals and birds including the endangered southwestern willow flycatcher (*Empidonax trailii extimus*). Tamarisk control efforts have begun throughout the Virgin River system. To date, the impetus behind tamarisk control efforts has been to reduce potential fire fuels near wildland/urban interfaces. Large scale tamarisk removal projects coupled with native revegetation efforts have occurred near the City of Mesquite, but a river side fringe (30 feet wide) of tamarisk has been left untouched to provide habitat for southwestern willow flycatcher and to minimize effects to the aquatic environment. Smaller scale tamarisk removal efforts have occurred in the upper river near the City of St. George, Utah largely for the same purposes.

High flows in 2005 were of sufficient scale that large thickets of tamarisk were removed along the Virgin River main stem and in its tributaries, temporarily resetting the riparian ecosystem in places. Efforts have been made to take advantage of the flood induced reset by re-vegetating post flood point bars with native coyote willow. However, shifting the system away from tamarisk as the dominant species will require constant effort.

Population growth in the riverside communities of St. George, Utah and Mesquite, Nevada has outpaced national averages for decades. At current growth rates, water demand projections for the City of St. George suggest available resources will be depleted by the year 2020. A proposed 160 mile pipeline from Lake Powell to Washington County, Utah could supply as much as 70,000 acre feet of water annually for municipal and industrial use in the upper Virgin River drainage. At the time of this review, the Lake Powell pipeline project has entered a preliminary design phase. Based on the level of congressional support, this project has a high likelihood of occurring. Potential effects to the Virgin River fish associated with a trans-drainage diversion and the inter-related population growth include: increased urban runoff; more infrastructure (increased encroachment on river and floodplain for transportation and utility conveyance); more recreational activity in the floodplain; potential introduction of non native species. However, with this project comes some potential to assist in the recovery of endangered fish by trading out current consumptive uses of Virgin River surface flows with the imported water. It is too early to tell how much room for recovery actions there is in this project. It is incumbent upon the Service and the Virgin River Program(s) to work with the project proponents to ensure that preservation of this fragile ecosystem is fully recognized as this, and other projects, are developed.

Environmental Baseline

Status of Species Within the Action Area

This programmatic Safe Harbor Agreement falls within the historic range of the flycatcher on all non-federal lands within Washington and Kane Counties, Utah. Within Washington county,

potential impacts to Virgin River chub and woundfin may occur in the Virgin River and its 100-year floodplain from the Quail Creek Diversion Dam downstream to the Utah/Arizona stateline.

The potential project area encompasses approximately 60 km of habitat for the Virgin River chub and woundfin, all of which is designated critical habitat. Habitat for the Virgin River chub in the project area represents 57 percent of the total designated critical habitat for this species and 38 percent of its historical range. The range of habitat in Utah for the woundfin is identical to that for the Virgin River chub.

The Utah Division of Wildlife Resources recently increased their sampling intensity between WFD and Pah Tempe in response to the invasion of red shiner in this reach in the autumn of 2002. These efforts are providing the Virgin River Resource and Management Program (Program) with some of its most comprehensive information on the entire fish community in this reach. This relatively intensive sampling regime has revealed no red shiner above WFD subsequent to the aggressive mechanical removal campaign. Researchers involved with this work have observed that woundfin in this reach have reproduced successfully in 2002 - 2005, but until 2004 the population was precariously low. Poor recruitment was attributed to the effects of the prolonged drought, high river temperatures, and chronic loss of early life stage to the reaches below the WFD (Fridell et al. 2004).

Fridell et al (2004) considered another potential factor limiting fish populations above WFD may be the periodic release of sediment (sluicing) accumulated behind the Quail Creek Diversion. Washington County Water Conservancy District (WCWCD) has recently developed an interim management plan in an attempt to address these concerns (Olsen 2004). However, two late summer 2007 fish kills that happened during sluicing of the Quail Creek Diversion indicate that sluicing activities continue to have impacts to native fish in the Virgin River.

UDWR reports that densities of both species have been greatest above the Washington Fields Diversion, which has been known to dry dam the river when flows above the diversion drop below 86 cfs. Red shiner have been eliminated upstream of Washington Fields Diversion as well. From Washington Fields Diversion downstream to the Johnson Diversion the native fish community becomes sparser due to periods of de-watering. Below the Johnson Diversion the river flows perennially (due primarily to irrigation returns during the base flow period), but is sometimes occupied by limited numbers of red shiner. The fish community from the Johnson Diversion downstream through the remainder of critical habitat is dominated by red shiner. Post flood sampling indicates that good numbers of native fish persisted above Washington Field Diversion; some native species were displaced below the Washington Field Diversion; and red shiner did not re-colonize the river upstream (Mr. Rick Fridell, UDWR, personal communication August 4, 2005).

Factors that may be affecting current distribution and abundance of Virgin River chub and woundfin in the Virgin River drainage in Utah include reduced flows, periodic dewatering of several reaches of the river, establishment of a continuous flow through the Virgin River Gorge which has allowed the invasion of red shiner, and the transformation of the hydrological regime to that which favors a different fish community comprised of greater proportions of speckled dace, spinedace and desert sucker. These same factors affect the entire Virgin River native fish

community, which includes the Virgin spinedace and the flannelmouth sucker, a species for which a range-wide conservation agreement was recently drafted. These factors also affect spinedace in tributaries to the Virgin River with the exception that red shiner do not appear to do as well in the smaller, higher gradient tributary systems.

The UDWR operating through the Virgin River Resource Management and Recovery Program has periodically treated portions of the Virgin River drainage with a fish toxicant (rotenone) to remove nonnative species thereby improving habitat for downmigrating native species. These chemical treatments typically occur downstream of the Washington Field Diversion. In November, 2005 such a treatment was conducted from the Johnson Diversion (located several miles downstream of the Washington Fields Diversion) downstream to the Utah / Arizona stateline fish barrier where the rotenone was detoxified (via metered application of potassium permanganate). Preliminary surveys had indicated that the fish community upstream of the Johnson Diversion comprised large numbers of native fish; including the endangered species. Native fish will undoubtedly repopulate the treated reaches slowly over time; larger numbers are expected to move downstream with higher/warmer flows and after annual spawning seasons. We can, however assume at the present time that the Virgin River between the Johnson Diversion and the Stateline Barrier is populated by limited numbers of native Virgin River fishes and potentially limited numbers of nonnative fish.

Factors Affecting Species Environment Within the Action Area

As mentioned above, virtually all factors that have contributed to the decline of the Virgin River Fish occur in the project area. Persistent negative interaction with nonnative species, particularly red shiner, is likely the greatest threat to the native fish populations in the Virgin River. This reach of river has been treated with rotenone approximately 14 times since 1988 to eliminate undesirable species. Prior to each treatment native species, including the endangered woundfin and Virgin River chub, are translocated upstream of the Washington Fields Diversion, where native species predominate. Two red shiner treatments are scheduled to occur during the fall 2008, i.e. all native fish in Utah not salvaged from the Virgin River downstream of the Washington Fields Diversion Program crews will be killed in an effort to reset the river for reestablishment of a native fish community. These and other related Virgin River Program activities (establishing effective barriers to upstream fish movements coupled with mechanical and chemical control projects) constitute an aggressive and ongoing nonnative control effort that will be integral in native Virgin River Fish recovery.

Effects of the Action

Direct and indirect effects to the two fish species may occur from operation of heavy equipment in and near the stream, dewatering (redirection of flows), removal of woody debris, removal of in channel sediments, streambank stabilization, and revegetation activities. Operation of heavy equipment in-stream or along the bank can disturb bottom sediments and increase turbidity, leak pollutants (fuels, oils, lubricants, and other substances), alter channel morphology by compaction from the weight of the vehicle, and directly harm aquatic biota such as vegetation, and immotile or slow moving species. These effects will be minimized, however, by scheduling activities after the spawning season, coordinating with local fisheries professionals to translocate native fish

prior to construction, through implementation of Best Management Practices (BMPs) for sediment and pollution control, and by designing any necessary stream bank stabilization structures to maintain as much natural channel function as possible.

Dewatering of stream channels should be used as a last resort during construction. This type of activity can have substantial effects on the fish species, which depend on continual flow. There may also be an increase in turbidity when the streamflow is returned to its original channel. If dewatering is necessary, these effects will be minimized by translocation of fish prior to dewatering operations. However, in-stream work may cause a number of other effects. Working in-stream is often the most expeditious way to remove debris, but tends to have greater direct aquatic impacts. Of the effects listed above, all would come into play. Working from the streambank reduces the level of impact but could increase the duration of impacts, as the work generally takes longer.

Revegetation work will cause short-term disturbance in and near the stream channel. Adverse effects to fish will be minimized by avoiding work during the spawning season and by translocation of fish if necessary. Restoring the riparian vegetation will reduce erosion, improve turbidity levels, and reduce temperatures in the stream (more of an issue on the smaller tributaries to the Virgin River than on the Virgin River mainstem). It will also provide a long-term source of detritus to the stream and result in long-term benefits to fish habitat.

Habitat modifications which favor nonnative species contribute to pressures on native species. The main biological threats to native fish are from nonnative fish, especially red shiner (*Cyprinella lutrensis*). While flow regulation may encourage population growth and dispersal of nonnatives, several types of habitat modifications may hinder the control of non-natives. Diligent mechanical removal and piscicide treatments have proved somewhat effective at controlling the spread of nonnative fish species, especially when used in conjunction with manmade barriers in the main river. Off channel ponds and wetlands can provide a refuge for non-natives if not managed correctly and it has recently been observed that concentrated flows of fresh water into the main channel from behind recently installed dikes provide refuge from piscicide treatments, hindering the progress of nonnative fish control.

Indirect effects include alterations to floodplains which limit stream interactions with the floodplain and alter sources of organic materials to stream food webs. Another indirect effect is the loss of habitat complexity that could result from some bank stabilization and debris removal (clearing and snagging). Removal of natural obstacles and creation of some types of bank and channel stabilization (rip-rap walls, gabions, toe rock, weirs) changes the way that the river functions, in terms of meandering and creating habitats. These changes can result in a simplification of the channel and a subsequent loss in habitat complexity that could be negative to the fish. Another indirect effect on target species is the complication and hindrance of programs to eradicate competitive nonnative fish species. Off channel habitats can provide refugia from chemical and mechanical treatments meant to remove nonnative species. Additionally, irrigation returns or other freshwater returns to the main channel provide refuge from chemical treatments for small-bodied non-native fish, which limit the effectiveness of these treatments.

Water Elements - Short term adverse effects to water quality may result from heavy equipment use in the stream channels. Water quality impacts are not expected to exceed species tolerances. The hydrologic regime will not be significantly altered by the action. Channel forming and maintenance functions will still occur in the areas between streambank stabilization structures. The area of floodplain should not be reduced in any project areas.

Physical Habitat Elements – Construction in some areas may destroy some elements of fish habitat such as secondary channels and backwaters; runs, pools and riffles; and instream cover in the short-term. In the long-term, these types of habitat elements are expected to reform.

Biological Environment (Food Supply, Predation and Competition) – Increases in sedimentation and pollution that result from heavy equipment operation in or near the streams may cause a reduction in food supply for the fishes.

In general, long-term efforts to improve the health and availability of riparian habitats will benefit Virgin River fishes by providing a long-term source of detritus to the stream, reducing erosion, improving turbidity levels, and reducing temperatures in the stream. While potential adverse effects to the Virgin River fishes may be associated with the proposed actions, this programmatic Safe Harbor Agreement can result in long-term benefits to fish habitat.

Cumulative Effects

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

Cumulative effects to the federally protected southwestern willow flycatcher, western yellow-billed cuckoo, Virgin River chub, and woundfin under the Proposed Actions would include, but are not limited to, the following broad types of impacts:

- Ongoing grazing and farming activities that will continue to occur on the enrolled properties within the action area.
- Changes in land use patterns or practices that adversely affect a species' critical, suitable, or potential habitat.
- Encroachment of human development (via urbanization and population growth) into a species' critical, suitable, or potential habitat.

Conclusion

After reviewing the status of the southwestern willow flycatcher, western yellow-billed cuckoo, Virgin River chub, and woundfin, the environmental baselines for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the actions as proposed, are not likely to jeopardize the continued existence of these species, and are not likely to destroy or adversely modify designated critical habitat. We base our conclusion on the following:

1. The proposed project will have a net conservation benefit to the flycatcher by improving and increasing available habitat and contributing to the enhancement and survival of the species, as well as associated beneficial impacts to riparian habitat for the western yellow-billed cuckoo, the Virgin River chub, and woundfin.

2. The proposed project may expand habitat for flycatchers located on private lands and promote their existence for a minimum of 15 years per individual Cooperative Agreement. Similar associated beneficial impacts are expected for the western yellow-billed cuckoo.

3. If the "enrolled properties" are returned to baseline conditions, they will still maintain baseline flycatcher habitat.

4. Management activities designed for flycatcher habitat enhancement will also provide associated beneficial impacts to riparian habitat for the Virgin River chub and woundfin by enhancing native riparian vegetation, reducing erosion, improving turbidity levels, and reducing water temperatures.

5. The commitment to incorporate bioengineering techniques into the project design should have a positive effect on fish habitat quality in the immediate area in the long-term.

INCIDENTAL TAKE AUTHROIZATION

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 measures described below are non-discretionary, and must be undertaken by the Agencies associated with this consultation so that they become binding conditions of any grant or permit issued to these Agencies, as appropriate, for the exemption in Section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require the Agencies to adhere to the terms and conditions of the Incidental Take Statement through

enforceable terms that are added to the Permit or grant document, the protective coverage of Section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Service or the Agencies must report the progress of the action and its impact on the species to the Service as specified in the Reporting Requirements below. [50 CFR §402.14(i)(3)]

Amount or Extent of Take Anticipated

During the terms of these Cooperative Agreements, flycatchers are expected to continue to occupy and expand upon the restored habitat on the "enrolled properties." Incidental take of flycatchers, cuckoos, as well as Virgin River chub and woundfin could occur as a result of a variety of activities, including the implementation of the management activities identified in the programmatic Safe Harbor Agreement. Take of flycatchers through normal agricultural activities such as grazing, ranching, and farming and restoration activities is authorized under the 10(a)(1)(A) permit associated with this programmatic Safe Harbor Agreement. Take may occur through harm and harassment of flycatchers and through mortality of individual flycatchers due to restoration activities or during or the course of normal grazing, ranching, and farming activities. Take may also occur through harm and harassment to cuckoos, Virgin River chub, and woundfin via the management activities executed for flycatchers habitat enhancement.

Incidental take numbers from implementing the management activities are difficult to quantify because we are unable to characterize each site that may be enrolled in this program, specific management activities planned on the sites, and the individual success of the management activities. However, we anticipate the total amount of take for the programmatic project will not exceed 3 flycatchers, 3 cuckoos, 5 Virgin River chubs, and 5 woundfins.

Effect of Take

In the accompanying Biological Opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to these species. The Agreement authorizes incidental take, because without the voluntary habitat improvements associated with this Agreement, it is unlikely that enhanced riparian habitat would continue to occur on these private lands.

If, after the term of these Agreements, the Program Participants propose to undertake any actions that fall outside the scope of habitat enhancements or their normal grazing, ranching or farming operations, they will give the Service advance notice thereof. This provision also encompasses expected actions that will result in the taking of the covered species, including any activities that will return the Program Participants' Properties to baseline conditions. The Program Participants and the Service will work cooperatively to minimize negative impacts to the covered species from such actions.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate for all Agencies to minimize impacts of incidental take of flycatchers, cuckoos, Virgin River chub, and woundfin.

1. Measures shall be implemented during the life of this programmatic Safe Harbor Agreement, to minimize impacts to flycatchers, cuckoos, Virgin River chub, and woundfin and prevent these species from being killed or harmed by any project-related activity.

2. Measures shall be implemented to minimize impacts to designated critical habitat for the flycatcher, Virgin River chub, and woundfin.

Term and Condition for the U.S. Fish and Wildlife Service

In order to be exempt from the prohibitions of Section 9 of the Act, the Fish and Wildlife Service must ensure implementation of this Agreement complies with the following Term and Condition, which implements the Reasonable and Prudent measure described above.

To implement Reasonable and Prudent Measure number 1 and number 2, the following Term and Condition shall be implemented:

a) All guidelines contained in the 10(a)(1)(A) permit associated with this consultation will be implemented.

Terms and Conditions for the Natural Resources Conservation Service

In order to be exempt from the prohibitions of Section 9 of the Act, the Natural Resources Conservation Service must ensure implementation of this Agreement complies with the following Term and Condition, which implements the Reasonable and Prudent measure described above.

To implement Reasonable and Prudent Measure number 1, the following Terms and Conditions shall be implemented:

a) Coordinate with the Fish and Wildlife Service on all funded activities associated with these Safe Harbor Agreements to ensure that impacts to listed and candidate species are minimized and avoided.

b) Southwestern willow flycatcher and Western yellow-billed cuckoo surveys will be conducted in accordance with Service approved survey protocol prior to any habitat modification activities.

c) Habitat disturbances will be avoided within 0.25 mile of occupied southwestern willow flycatcher and western yellow-billed cuckoo habitat from May 1 to August 15.

d) To avoid direct and indirect (downstream) impacts to spawning fish (spawning period is April 1 – July 31) all channel disturbing activities will be conducted from August 1

thru March 31 and will be implemented in as short of a construction time period as possible.

e) Translocation of endangered fish out of affected area – coordinate with the Utah Division of Wildlife Resources (contact Mr. Rick Fridell 435.688.1426) (72) hours prior to any construction activity that would disturb the active channel to schedule native fish clearance (translocation).

f) During all channel disturbing activities the applicant must have a qualified fish biologist, with experience in desert river ecosystems, on-site to monitor environmental effects.

g) Maintain unrestricted fish passage through the project area at all times. Consult with Mr. Rick Fridell (contact information above) or his designee if construction activities result in any increase in local channel gradient. Dewatering of stream channels should be used as a last resort during construction.

h) If construction materials are displaced by high flows the applicant must contact Mr. Paul Abate, USFWS (801.975.3330; ext 130) as soon as possible to coordinate least intrusive retrieval methods.

i) If herbicides are used for vegetation treatments, they must be Service-approved chemicals, be applied in a manner that will not impact fish or wildlife resources (i.e. adequate distance from water for chemical mixing and spraying), and follow NRCS Standards and Specifications for Application.

To implement Reasonable and Prudent Measure number 2, the following Term and Condition shall be implemented:

a) The Service has developed the following list of best management practices (BMPs) for construction activities in aquatic and riparian habitats. The Program Administrator and Program Participants must adhere to all BMPs that apply to the individual Cooperative Agreements:

    1) If bank stabilization and erosion control structures are necessary, they will be properly designed to maintain or enhance natural stream function (sinuosity, gradient, hydrology, and sediment transport).

    2) Concrete, asphalt, steel or other human-made materials will not be used for bank stabilization or in the active stream channel. Boulders, root-wads and other natural materials found locally will be used to stabilize stream banks.

    3) Care will be taken to minimize sedimentation resulting from bank or stream bed disturbance.

4) Equipment will be cleaned to remove noxious weeds/seeds and petroleum products prior to moving on site.

5) Fueling machinery will occur off site or in a confined, designated area to prevent spillage into waterways and wetlands. Oil booms will be on site and placed downstream of the project site prior to beginning work if equipment will be operating in the low flow channel.

6) Materials will not be stockpiled in the riparian area or other sensitive areas, e.g., wetlands.

7) Fill materials will be free of fines, waste, pollutants, and noxious weeds/seeds.

8) Equipment will work from the top of the bank or from the channel to minimize disturbance to the riparian area and to protect the banks. Heavy equipment should avoid crossing and/or disturbing wetlands.

9) Ingress and egress access will be kept to a minimum.

10) Excavated soils will be sorted into mineral soils and top soils. When backfilling a disturbed site top soils will be placed on top to provide a seed bed for native plants.

11) Disturbed areas will be monitored for noxious and undesirable plant species and control actions will be implemented if necessary.

12) Disturbed areas (work site(s), ingress, egress, stockpile site(s), pit) will be revegetated when appropriate after construction with native plants or certified weed-free native seed. The planting will be monitored for success. If the planting fails it will be reseeded/planted.

a) All construction material must be removed from the active channel and from the 100-year floodplain at the end of the project. The channel and floodplain should be restored to the natural condition (topography and vegetation).

b) Coordinate with the Virgin River Resource Management and Recovery Program (contact Mr. Steve Meismer 435.673.3617) for technical input on proper riparian revegetation techniques and possible sources of vegetative materials.

c) The use of any streambank stabilization structures (e.g. rock riprap) in an active channel or the 100-year floodplain of any project related river shall be coordinated with UDWR and USFWS during the planning stage. Other alternative options such as restoration with natural vegetation must be considered prior to relying on rock riprap. If management activities are determined to cause significant impacts, consultation with the Service will be reinitiated.

d) Coordinate any floodplain wetland restoration, off-channel open water habitat creation, and riprap wall installation with UDWR, Virgin River Resource Management and Recovery Program, and USFWS to prevent and plan for potential treatment of nonnative fish habitat.

REPORTING REQUIREMENTS

Upon locating a dead, injured, or stressed flycatcher, cuckoo, Virgin River chub, or woundfin, initial notification must be made within one business day to the Service=s Division of Law Enforcement in Cedar City, Utah at telephone (435) 865-0861, the Service=s Ecological Services Office at telephone (801) 975-3330, and the Utah Division of Wildlife Resources in Cedar City at telephone (435) 865-6120 or in Saint George at telephone (435) 688-1426.

Instructions for proper handling and disposition of such specimens will be issued by the Service=s Division of Law Enforcement consistent with the provisions of the Incidental Take Statement. Care must be taken in handling sick or injured animals to ensure effective treatment and care. Dead specimens should be handled carefully to preserve biological material in the best possible state.

RE-INITIATION STATEMENT

This concludes formal consultation on the proposed programmatic Safe Harbor Agreement and associated Permit in Utah. As provided in 50 CFR '402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 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 not considered in this opinion, or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

Thank you for your interest in conserving threatened and endangered species. If you have any questions please contact Laura Romin or Kate Schwager at 801-975-3330 ext. 142 or ext. 132, respectively.

cc: Utah Division of Wildlife Resources, Southern Regional Office,
1470 North Airport Road, Cedar City, UT 84720

Utah Division of Wildlife Resources, Rick Fridell and Mr. Michael Golden
344 East Sunland Drive, Suite 8.
St. George, UT84790

Color Country Resource Conservation & Development (RC&D)
2390 W. Highway 56, Suite 14a
Cedar City, UT 84720

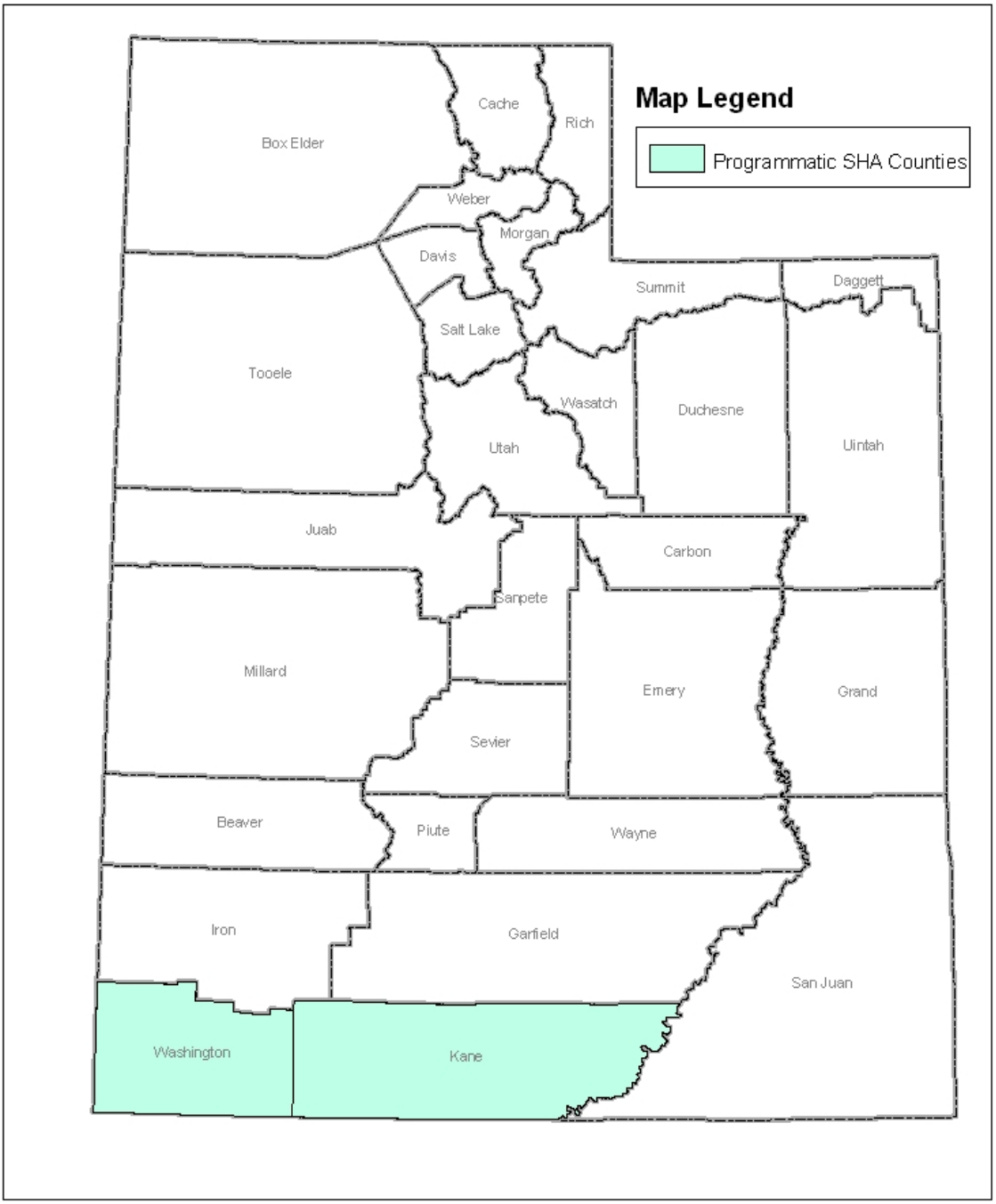
USDA - Natural Resources Conservation Service (NRCS)
Wallace F. Bennett Federal Building
125 South State Street, Room 4402
Salt Lake City, UT 84138-1100

bcc: Project file
Reading file
Employee file

FILE: 6-UT-08-F-011

Z: Schwager/
UPD_Safe Harbor/SWWFL_SHA/SWWFL_SHA_programmatic_BO_6_25_08_final edits.doc

Flycatcher Programmatic Safe Harbor Agreement Map



Literature Cited

Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo

Anderson, B. W., A. Higgins, and R. D. Ohmart. 1977. Avian use of saltcedar communities in the lower Colorado River Valley. *In:* Johnson RR, Jones DA (tech. coord.), Proc. Symp. The importance, preservation and management of riparian habitat, July 9, 1977, Tucson, Arizona. USDA Forest Service Rocky Mountain Forest Range Experiment Station, Fort Collins, Colorado. General Technical Report RM-43, pp. 128-136.

Behle, W. H., Bushman, and C. M. Greenhalgh. 1958. Birds of the Kanab area and adjacent high plateaus of southern Utah. University of Utah Biological Service. 11:1-92.

Behle, W. H. and H. G. Higgins. 1959. The birds of Glen Canyon. *In:* Ecological Studies of Flora and Fauna in Glen Canyon (A.M. Woodbury, ed.) University Utah Anthropol. Pap. 40 (Glen Canyon Series No. 7), pp 107-133.

Behle, W. H. 1985. Utah Birds: Geographic Distribution and Systematics: Occasional Publication, no. 5. Utah Museum of Natural History, University of Utah, Salt Lake City.

Browning, M. R. 1993. Comments on the taxonomy of *Empidonax trailli* (willow flycatcher). Western Birds 24:241-257.

Christensen, E. M. 1962. The rate of naturalization of *Tamarix* in Utah. American Midland Naturalist 68:51-57.

Corman, T.E., and R.T. Magill. 2000. Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report. Arizona Game and Fish, Technical Report 150. pp. 1-49.

Finch, M. F., J. F. Kelly, and J. E. Cartron. 2000. Migration and Winter Ecology. Chapter 7 *In* D. Finch and S. Stoleson, eds. Status, Ecology and Conservation of the Southwestern Willow Flycatcher. USDA Forest Service General Technical Report RMRS-GTR-60.

Franzreb, K. F., and S. A. Laymon. 1993. A reassessment of the taxonomic status of the Yellow-billed Cuckoo. Western Birds 24: 17-18.

Durst, S. L., M. K. Sogge, H. C. English, S. O. Williams III, B. E. Kus, S. J. Sferra. 2004. Southwestern willow flycatcher breeding site and territory summary – 2004. U. S. Geological Survey, Southwest Biological Science Center, Colorado Plateau Research Station. Flagstaff, Arizona. 18 pp.

Gaines, D. 1974. A new look at the nesting riparian avifauna of the Sacramento Valley, California. West. Birds 5: 61-80.

Gaines, D. and S. A. Laymon. 1984. Decline, Status, and Preservation of the Yellowbilled Cuckoo in California. Western Birds:49-80.

Graf, W. L. 1982. Tamarisk and river-channel management. Environmental Management 6:283-296.

Halterman, M. D. 1991. Distribution and Habitat Use of the Yellow-Billed Cuckoo (*Coccyzus americanus occidentalis*) on the Sacramento River, California, 1987-90, MS Thesis: California State University: Chico, CA.

Halterman, M. D., and S. A. Laymon. 1994. Population status, site tenacity, and habitat requirements of the Yellow-billed Cuckoo at the Bill Williams River, Arizona: Summer 1993 Report no. 1448-00002-93-022 for USDI Fish and Wildlife Service, Bill Williams River National Wildlife Refuge, Parker AZ.

Halterman, M. D. and S. A Laymon. 1995. Population status, site tenacity, and habitat requirements of the Yellow-billed Cuckoo at the Bill Williams River, Arizona: summer 1994. Report no. 1448-00002-94-022 for USDI Fish and Wildlife Service, Bill Williams River National Wildlife Refuge, Parker AZ.

Horton, J. S. 1977. The development and perpetuation of the permanent tamarisk type in the phreatophyte zone of the southwest. Contributed paper, Symposium on the Importance, Preservation and Management of the Riparian Habitat, July 9, 1977, Tucson, Arizona. pp 124-127.

Howell, S. N. G. and S. Webb. 1995. A Guide to the Birds of Mexico and Northern Central America. Oxford University Press. 851 pp.

Hubbard, J. P. 1987. The status of the Willow flycatcher in New Mexico. Endangered Species Program, New Mexico Dept. Of Game and Fish, Santa Fe, New Mexico. 29 pp.

Johnson, M. J. and C. O'Brien. 1998. Southwestern willow flycatcher and yellow-billed cuckoo surveys along the San Juan River, Utah (Four Corners Bridge - Mexican Hat): 1998. Final Report to the Utah Division of Wildlife Resources (Contract # 976475). Colorado Plateau Field Station/Northern Arizona University report. 45 pp.

Johnson, M. J. 1998. Southwestern willow flycatcher surveys in the Manti-La Sal National Forest, (Moab and Monticello Districts) Utah: 1998. Final report to the Utah Division of Wildlife Resources. USGS Biological Resources Division, Forest and Rangeland Ecosystem Science Center, Colorado Plateau Field Station, Northern Arizona University report, Flagstaff, Arizona. 19 pp.

Johnson, M. J., A. Brand, H. C. English, C. Michaud, and B. Moore. 1999a. Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo Surveys along the Colorado River (Dewey Bridge - Canyonlands National Park Northern Boundary) and Green River, UT - Canyonlands National Park Northern Boundary) 1999. U.S. Geological Survey report to the U.S. Bureau of Reclamation and the Utah Department of Natural Resources.

Johnson, M. J., A. Brand, H. C. English, C. Michaud, and B. Moore. 1999b. Southwestern Willow Flycatcher and Western Yellow-billed Cuckoo Surveys in the Canyonlands National Park along the Colorado and Green Rivers, 1999. U.S. Geological Survey report to the U.S. Bureau of Reclamation and the Utah Department of Wildlife Resources.

Langridge, S. M. and M. K. Sogge. 1998. Banding and genetic sampling of willow flycatcher in Utah: 1997 and 1998. U.S.G.S. Colorado Plateau Field Station/Northern Arizona University report. 60 pp.

Laymon, S.A. and M.D. Halterman. 1987. Can the Western Subspecies of the Yellow-billed Cuckoo be saved for Extinction? Western Birds 18:19-25.

Laymon S. A., and M. D. Halterman. 1989. A proposed habitat management plan for Yellow-billed Cuckoos in California, Proceedings of the California Riparian Systems Conference p. 272-277.

Laymon S.A , and M. D. Halterman. 1990. Proposed habitat management plan for Yellow-billed Cuckoos in Claifornia. In Proc. of the California riparian systems conference: protection, management, and restoration for the 1990's: p. 272-277; 1988 Sept 22-24, Davis, CA. Fen. Tech. Rep PSW-110. berkeley, CA: Pacific Southwest Forest and Range Experimental Station, USDA.

Owen, J. C. and M. K. Sogge. 2002. Physiological condition of southwestern willow flycatchers in native and saltcedar habitats. U.S. Geological Survey report to the Arizona Department of Transportation, Phoenix, Arizona.

Paxton, E. H. 2000. Molecular Genetic Structuring and Demographic History of the Willow Flycatcher (*Empidonax trailli*). A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Biology. Northern Arizona University, May 2000.

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

Phillips, A. R., J. Marshall, and G. Monson. 1964. The Birds of Arizona. University of Arizona Press, Tucson, Arizona. 212 pp.

Ridgely, R. S. and G. Tudor. 1994. The Birds of South America. Volume II: The Suboscine Passerines. University of Texas Press, Austin, Texas. 814 pp.

Schreier, W. 1996. Bryce Canyon National Park 1996 Federal Endangered Avian Species Survey Report: Southwestern Willow Flycatcher. Colorado Plateau System Support Office, Intermountain Field Area, National Park Service: Bryce Canyon, Utah.

Sedgwick, J. A. 1998. Regional Variability in the Song of the Southwestern Willow Flycatcher. Draft report to the Arizona Game and Fish Department. USGS Biological Resources Division, Midcontinent Research Station, Fort Collins, CO. 15 pp. plus appendices.

Sedgwick, J. A. 2001. Geographic variation in the song of willow flycatchers: differentiation between *Empidonax trailli adastus* and *E. t. extimus*. Auk 118(2):366-379, 2001.

Sogge, M. K. 2000. Breeding Season Ecology. Chapter 6 *In* D. Finch and S. Stoleson, eds. Status, Ecology and Conservation of the Southwestern Willow Flycatcher. USDA Forest Service General Technical Report RMRS-GTR-60.

Sogge, M. K., R. M. Marshall, S. J. Sferra, and T. J. Tibbitts. 1997. A Southwestern Willow Flycatcher Natural History Summary and Survey Protocol. Technical Report NPS/NAUCPRS/NRTR-97/12.

Sogge, M. K. and R. M. Marshall. 2000. A survey of current breeding habitats. Chapter 9 *In* D. Finch and S. Stoleson, eds. Status, Ecology and Conservation of the Southwestern Willow Flycatcher. USDA Forest Service General Technical Report RMRS-GTR-60.

Sogge, M. K., S. J. Sferra, T. D. McCarthey, S. O. Williams, and B. E. Kus. 2003. Distribution and characteristics of Southwestern Willow Flycatcher Breeding Sites and Territories. Studies in Avian Biology 26:5-11.

Sogge, M. K. and T. J. Tibbits. 1994. Distribution and Status of the Southwestern Willow Flycatcher along the Colorado River in the Grand Canyon - 1994. Summary Report. National Biological Service Colorado Plateau Research Station/Northern Arizona University and U.S. Fish and Wildlife Service. 37 pp.

Stiles, F. G. and A. F. Skutch. 1989. A Guide to the Birds of Costa Rica. Cornell University Press, New York.

Travis, J. R. 1996. Song Types of Willow Flycatchers in New Mexico. Contract No. 95-516-67. Endangered Species Program, New Mexico Department of Game and Fish, Santa Fe, New Mexico. 31 pp.

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

Unitt, P. 1997. Winter range of Empidonax trailli extimus as documented by existing museum collections. Report to the U.S. Bureau of Reclamation, Phoenix, Arizona.

U.S. Fish and Wildlife Service (USFWS). 1995. Final rule determining endangered status for the southwestern willow flycatcher (*Empidonax traillii extimus*). February 27, 1995. Federal Register 60:10694.

U.S. Fish and Wildlife Service (USFWS). 1997. Final determination of critical habitat for the southwestern willow flycatcher. July 22, 1997. Federal Register 62(140):39129-39146.

U.S. Fish and Wildlife Service (USFWS). 2001a. Endangered and Threatened Wildlife and Plants; 12-Month Finding for a Petition To List the Yellow-billed Cuckoo (*Coccyzus americanus*) in the Western Continental United States. DEPARTMENT OF THE INTERIOR, Fish and Wildlife Service, 50 CFR Part 17. July 25, 2001

U.S. Fish and Wildlife Service (USFWS). 2001b. Southwestern Willow Flycatcher Recovery Plan. Albuquerque, New Mexico. Prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup.

U.S. Fish and Wildlife Service (USFWS). 2002. Final Recovery Plan Southwestern Willow Flycatcher. Albuquerque, New Mexico. Prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup.

U.S. Fish and Wildlife Service (USFWS). 2003. Final Recovery Plan Southwestern Willow Flycatcher. Albuquerque, New Mexico. Prepared by Southwestern Willow Flycatcher Recovery Team Technical Subgroup.

U.S. Fish and Wildlife Service (USFWS). 2005. Designation of Critical Habitat for Southwestern willow flycatcher, Final Rule. October 19, 2005. Federal Register 70(201):60886-61009.

Wauer, R. H. and D. L. Carter. 1965. Birds of Zion National Park and vicinity. Zion Natural History Association, Springdale, Utah. 92 pp.

Whitfield, M. J. and C. M. Strong. 1995. A Brown-headed cowbird control program and monitoring for the Southwestern Willow Flycatcher, South Fork Kern River, California, 1995. California Department of Fish and Game, Sacramento. Bird and Mammal Conservation Program Report 95-4.

Whitfield, M. J. and K. M. Enos. 1996. A Brown-headed cowbird control program and monitoring for the Southwestern Willow Flycatcher, South Fork Kern River, California, 1996. California Department of Fish and Game, Sacramento, California. Final report for contract #FG4100WM-1.

Yong, W. and D. M. Finch. 1997. Migration of the Willow Flycatcher along the Middle Rio Grande. Wilson Bulletin 109:253-268.

Virgin River Fishes (Virgin River Chub and Woundfin)

Addley, R.C., T.B. Hardy, M. Combes, and A. Guzha. 2005. Woundfin temperature and growth investigations – draft. Utah State University – Utah Water Research Laboratory, Logan, Utah. Virgin River Resource Management and Recovery Program Project No. VI.04.01C.

Branson, B. A. 1963. The olfactory apparatus of *Hybopsis gelida* (Girard) and *Hybopsis aestivales* (Girard) (Pisces: Cyprinidae). J. Morphol. 113:215-229.

Branson, B. A. 1966. Some rare and vanishing fishes. Bio. Sci. 1966:611-613.

Cope, E. D. and H. C. Yarrow. 1875. Report upon the collections of fishes made in portions of Nevada, Utah, California, Colorado, New Mexico, and Arizona, during the years 1871, 1872, 1873, and 1874. Rept. Georgr. Geol. Expl. Surv. W 100th Meridian (Wheeler Survey), 5:635-703.

Cross, J. N. 1967. Handbook of fishes of Kansas. Misc. Publ.. Mus. Nat. Hist., Univ. Kansas 45:1-357.

Cross, J. N. 1975. Ecological distribution of the fishes of the Virgin River (Utah, Arizona, Nevada). Unpubl. M.S. Thesis, University of Nevada, Las Vegas.

Deacon, J. E. 1977. Habitat requirements of woundfin in the Virgin River in relation to the proposed Warner Valley Project, Section C. *In*: A. Owen, (ed.). Impact of Warner Valley Project on endangered fish of the Virgin River. Vaughn Hansen Associates, Salt Lake City, Utah.

Deacon, J. E. 1979. Endangered and threatened fishes of the West. Great Basin Naturalist Memoirs 3:41-64.

Deacon, J. E. 1988. The endangered woundfin and water management in the Virgin River, Utah, Arizona, and Nevada. Fisheries 13:18-24.

Deacon, J. E. and T. B. Hardy. 1984. Stream flow requirements of woundfin (*Plagopterus argentissimus*): Cyprinidae in the Virgin River, Utah, Arizona, Nevada. Pages 45-46 *In*: N.V. Horner, (ed). Festschrift for Walter W. Dalquest in honor of his 66th birthday. Department of Biology, Midwestern University, Wichita Falls, Texas.

Deacon, J. E., P. B. Schumann, and E. L. Stuenkel. 1987. Thermal tolerances and preferences of fishes of the Virgin River System (Utah, Arizona, Nevada). Great Basin Nat. 47(4):538-546.

DeLoach, C. J. 1991. Saltcedar, an exotic weed of western North American riparian areas: A review of its taxonomy, biology, harmful and beneficial values, and its potential for biological control. Report to the Bureau of Reclamation, Boulder City, Nevada, Contract No. 7-AG-30-04930.

DeMarais, B. D., T. E. Dowling, M. E. Douglas, W. L. Minckley, and P. C. Marsh. 1992. Origin of *Gila seminuda* [Teleostei: Cyprinidea] through introgressive hybridization; Implications for evolution and conservation. Proc. Nat. Acad. Sci. 89:2747-2751.

Follett, W. I. 1961. The fresh-water fishes - their origins and affinities. *In*: Symposium, the biogeography of Baja California and adjacent seas. Syst. Zool. 9:212-232.

Fridell, R.A., M.A. Schijf, and M.K. Morvelius. 2004. Virgin River Fish Distribution between the Washington Fields Diversion and Pah Tempe, 2003. Final Report Utah Division of Wildlife Resources, Publiction Number 04-12.

Fridell, R.A., and M.K. Morvilius. 2005a. Distribution and abundance of fish in the Virgin River between Washington Fields Diversion and Pah Tempe, 2004. Utah Division of Wildlife Resources, Salt Lake City, Utah. Publ. No. 05-21. 38 pp.

Fridell, R.A., and M.K. Morvilius. 2005b. Woundfin stocking and dispersal monitoring on the Virgin River, Utah, 2004. Utah Division of Wildlife Resources, Salt Lake City, Utah. Publ. No. 05-07. 35 pp.

Gilbert, C. H. and N. B. Scofield. 1898. Notes on collection of fishes from the Colorado Basin in Arizona. Proc. U.S. Nat. Mus. 20:487-499.

Golden, M.E., and P.B. Holden. 2002. Fish need water! Low flow impacts on the native fish of the Virgin River. Paper presented at the 34th Annual Meeting of the Desert Fishes Council, San Lois Potosi, Mexico.

Golden, M.E., and P.B. Holden. 2004. Summary of Lower Virgin River studies 1996-2002, Final Report. Prepared for the Department of Resources, Southern Nevada Water Authority. BIO-WEST Report PR-449-2.

Golden, M., and P. Holden. 2005. Evaluation of Collection Methods for Virgin River Chub with Options for a Long-Term Monitoring Plan. Final Report, PR-922-2.

Greger, P. and J. E. Deacon. 1982. Observations on woundfin spawning and growth in an outdoor experimental stream. Great Basin Naturalist 42:549-552.

Greger, P. and J. E. Deacon. 1988. Food partitioning among the fishes of the Virgin River. Copeia 1988(2):314-323.

Gregory, S. C. and J. E. Deacon. 1994. Human induced changes to native fishes in the Virgin River drainage. Proceedings of the American Water Resources Association 1994:435-444.

Hardy, T. B., B. Bartz, and W. Carter. 1989. Population dynamics of the fishes in the Virgin River from 1984 through 1987 and impact analyses of the Quail Creek and North Creek reservoir systems. Utah State University, Logan, Utah.

Hickman, T. J. 1987. Study of fishes in the Virgin River (Utah). Ann. Rept., 1986. Western Ecosystems, P.O. Box 1575, St. George, Utah.

Holden, P.B., M.E. Golden, and S.J. Zucker. 2001. An evaluation of changes in woundfin (*Plagopterus argentissimus*) populations in the Virgin River, Utah, Arizona, and Nevada, 1976-1999. Report #PR-735-1 by BIO-WEST, Inc., Logan, Utah. 77pp.

Jordan, D. S. and B. W. Evermann. 1896. The fishes of North and Middle America. Bull. U.S.Natl. Mus., Part i, 47:i+1x, 1-1240.

Lentsch, L.D., M.J. Perkins, and H. Maddux. 1995. Virgin Spinedace Conservation Agreement and Strategy. Publication Number 95-13. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

Meek, S. E. 1904. The freshwater fishes of Mexico north of the Isthmus of Tehuantepec. Field Mus. 93 Zool. Ser. 5:i + 1xiii, 1-252.

Miller, R. R. and C. L. Hubbs. 1960. The spiny-rayed cyprinid fishes (Plagopterini) of the Colorado River system. Misc. Publ. Mus. Zool. Univ. Mich. 115:1-39.

Minckley, W. L. 1980. Plagopterus argentissimus Cope. Page 344 *In*: D. S. Lee et al. (eds). Atlas of North American freshwater fishes. North Carolina State Museum of Natural History, Raleigh, North Carolina.

Moore, G. A. 1950. The cutaneous sense organs of barbeled minnows adapted to life in the muddy waters of the Great Plains region. Trans. Amer. Microscop. Soc. 69:69-95.

Morvilius–Auer, M.K., and R.A. Fridell. 2006. Virgin spinedace (*Lepidomeda mollispinis mollispinis*) population monitoring summary, 1994-2005. Utah Division of Wildlife Resources, Salt Lake City, Utah. Publ. No. 06-04. 49 pp.

Olsen, D. 2004. Quail Creek Diversion; Interim Sediment Management Plan. BioWest PR-916. Submitted to Washington County Water Conservancy District.

Peters, E. J. 1970. Changes with growth in selected body proportions of the woundfin (*Plagopterus argentissimus* Cope: Cyprinidae). Unpubl. M.S. Thesis, Brigham Young University, Provo, Utah.

Schumann, P. B. 1978. Response to temperature and dissolved oxygen in the roundtail chub, *Gila robusta* (Baird and Girard). Unpubl. M.S. Thesis, University of Nevada, Las Vegas.

Snyder, J. O. 1915. Notes on a collection of fishes made by Dr. Edgar A. Mearns from rivers tributary to the Gulf of California. Proc. U.S. Natl. Mus. 40:573-586.

U.S. Fish and Wildlife Service. 2005. Biological Opinion – Washington Fields Diversion Fish Screen. Formal Consultation No. 6-UT-04-F-006.

Winget, R. N. and R. W. Baumann. 1977. Virgin River, Utah-Arizona-Nevada, aquatic habitat, fisheries and macroinvertebrate studies. In: Impact of Warner Valley Water Project on endangered fish of the Virgin River. Vaughn Hansen Associates, Salt Lake City, Utah.

Williams, C. D. and J. E. Deacon. 1998. Recommendations for a Comprehensive Virgin River Watershed and Native Fishes Conservation Program. Pacific Rivers Council.

EXHIBIT 1

Cooperative Agreement

This voluntary agreement recognizes the unique and important role that private landowners in Utah can play in helping wildlife valued by the people of the State and of the nation. The purpose of the agreement is to enable land management activities beneficial to rare species to be carried out on privately owned land while minimizing the impact of such activities on the right and ability of the owner or manager thereof to use it as he or she wishes. The Program Administrator and Program Participants must also comply with any applicable local, State, and Federal laws in carrying out specific measures included under this Cooperative Agreement. The terms of this agreement are as follows:

1. The Color Country Resource Conservation and Development Council, Inc. ("Program Administrator") and _____ (Program Participant) have entered into this Agreement to improve and manage native riparian habitat for the betterment of the southwestern willow flycatcher, on certain lands owned or managed by the Program Participant that are delineated on the attached map (Exhibit A), and referred to herein as the "enrolled property." The enrolled property may comprise all or part of a parcel or parcels.

2. The U.S. Fish and Wildlife Service (Service) has issued to the Program Administrator an endangered species permit that authorizes, until the year [2057], the incidental taking of southwestern willow flycatchers ("flycatchers") and their habitat by the Program Participant and other persons who enter into cooperative agreements with the Program Administrator pursuant to the permit.

3. The Program Participant agrees to conduct, or allow to be conducted, activities to restore, enhance, or manage native riparian habitat in accordance with the plan set forth in the attached Exhibit B, and maintain such habitat for a minimum period of 15 years from the date of this Agreement.

4. The Program Participant, or his agent, further agrees to provide the Program Administrator with a brief report, due December 31 of the year following the signing of this Cooperative Agreement, and annually thereafter. Such report, in the format shown in Exhibit 3 or in any other simple format to be developed by the Program Administrator, shall identify any management activities undertaken to restore, enhance, or manage native riparian habitat on the property subject to this Cooperative Agreement, as well as any changes in the extent of such habitat in the preceding year. The Program participant understands and agrees that the Program Administrator will include these annual reports with the reports that it is required to submit to the Service from time to time.

5. In consideration of the foregoing, the Program Administrator has issued to the Program Participant the attached Certificate of Inclusion under the Program Administrator's permit. This Certificate authorizes the Program Participant and the Program Participant's successors or assigns:

a) To take the species or its habitat identified above incidental to implementing the management activities set forth in this Agreement;

b) After initiation of, and consistent with such management activities, to carry out any other lawful activity that may cause the incidental taking of such species on Program Participant's property, provided that such taking does not reduce the amount of suitable Flycatcher habitat below the amount specified in Part 7 below.

As used in this Cooperative Agreement, "incidental" take refers to the unintentional or unavoidable killing or injuring of the species identified above in the course of carrying out otherwise lawful activities. Nothing in this Cooperative Agreement authorizes the Program Participant to capture, collect, or deliberately kill or injure any such species.

6. After the agreed-upon management activities have been initiated, the Program Participant agrees to give the Program Administrator at least 90 days notice (except when precluded by emergency situations) prior to commencing any activity likely to reduce the amount of suitable flycatcher habitat on the enrolled property, and the Program Participant further agrees to carry out such activity outside the normal nesting season of the flycatcher (i.e., before May 1 or after August 15 in any calendar year.

7. The Program Participant and the Program Administrator agree that according to surveys conducted by the Service or another party acceptable to the Service, at the time that this Cooperative Agreement was signed, flycatchers were [present or absent] and [X] acres of available flycatcher habitat were present on the enrolled property located at the general locations indicated on Exhibit A. [Because flycatchers were absent, baseline conditions applicable to the property are zero. OR, that number of acres of available flycatcher habitat represents the "baseline conditions" applicable to the property. So long as that baseline amount of available flycatcher habitat remains on the property, the Program Participant may incidentally take the species as provided in Part 5 above. If requested by the Service within 90 days of its receiving a copy of the Cooperative Agreement, the Program Participant agrees to allow the Service (or Utah Division of Wildlife Resources) access to the enrolled property for the sole purpose of establishing a baseline determination set forth in this paragraph.

8. Successors and assigns may incur the responsibilities and benefits of this Agreement by becoming a party thereto, unless terminated in writing as specified below. If the Program Participant decides to sell or otherwise transfer ownership or management of the property, the Program Participant agrees to give the Program Administrator notice of such decision prior to the intended sale or transfer and to give the purchaser or transferee notice of this Cooperative Agreement so that the purchaser or transferee can become a party to it if he or she so wishes. The Program Participant will inform the Program Administrator in the event all, or part of, the Program Participant's property delineated on the map labeled Exhibit A is transferred to another owner.

9. The Program Participant shall grant the Program Administrator and the Service or their agent's access to the Program Participant's property as necessary to confirm that the restoration, enhancement, or management activities set forth in Exhibit B have been conducted, and to assess the condition of the habitats being managed under the Cooperative Agreement. The Program

Administrator shall give the Program Participant reasonable notice of these visits and shall be accompanied by the Program Participant or an agent of the Program Participant if the Program Participant so desires.

10. The Program Participant, or the Program Participant's successors or assigns, may terminate the Cooperative Agreement for reasons beyond their control at any time by giving 60 days written notification to the Program Administrator, in which case the Program Participant's or the Program participant's successors or assigns' right to incidentally take the species under the permit shall expire 60 days after giving such notice. This Cooperative Agreement can be renewed, extended, or modified at any time subject to both the Program Participant's and the Program Administrator's approval. The baseline conditions in any renewal or extension of this Cooperative Agreement shall be the same as set forth in Part 7 above.

Emergency situations, such as flood, drought, wildfire, disease, or other changed circumstances may require management actions not specified in the Conservation Agreement. In these situations, the Parties acknowledge that it may be impossible to provide the 90-day notice required by this Agreement (Section 6) prior to initiation of activities that could result in take of the covered species. However, the Program Participant will notify the Program Administrator immediately of discovering such a situation, and will make reasonable accommodations to the Program Administrator and the Service for salvaging populations of the covered species. In the event that changed circumstances destroy the restored habitat the Program Participant with the assistance of Program Administrator may replant or take other corrective action to restore the destroyed habitat.

11. The Program Participant and the Program Administrator agree with respect to liability and indemnification for injuries to persons or property arising out of this Agreement as follows: [details may vary from agreement to agreement] the Program Participant assumes no liability for injury to any employee or representative of Program Administrator or the Service in the course of any visit to the property under this agreement. Neither the Program Administrator nor the Service shall be liable for any damage to the property of the Program Participant or Landowner arising from any visit to the property pursuant to this agreement.

12. So long as the permit and Certificate of Inclusion remain in effect, and provided the management activities required by this Agreement have been carried out, the Program Participant may exercise the right conferred by the Program Administrator's permit and the Certificate of Inclusion to incidentally take the species identified above on the enrolled property.

Color Country Resource Conservation and Development Council, Inc.

_____, Program Participant

By_____ By_____

Date_____ Date_____

Exhibit A

[map of the property subject to the cooperative agreement]

Exhibit B

[specifications for management actions to be carried out]

CERTIFICATE OF INCLUSION

Article I. This certifies that the property described as follows [DESCRIPTION], owned by [NAME OF PROGRAM PARTICIPANT], is included within the scope of Permit No. ____ issued by the U.S. Fish and Wildlife Service on [DATE] for a period of 50 years to the Color Country Resource Conservation and Development Council under the authority of Section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1539(a)(1)(A). Such permit authorizes certain activities by participating landowners as part of a safe harbor program to restore and enhance habitat for the southwestern willow flycatcher. Pursuant to that permit and this certificate, the holder of this certificate is authorized to engage in activities on the above described property that may result in the incidental taking of such species, subject only to the terms and conditions of such permit and the cooperative agreement entered into pursuant thereto by the Color Country Resource Conservation and Development Council, Inc. and [NAME OF PROGRAM PARTICIPANT] on [DATE].

_____

Name and Title of Representative of the
Color Country Resource Conservation and Development Council, Inc.

Date:_____

EXHIBIT 2

Annual Report for
Safe Harbor Agreement between the U.S. Fish and Wildlife Service
and Color Country Resource Conservation and Development Council, Inc.

Permittee's Name: Color Country Resource Conservation and Development Council, Inc.

Permit Tracking Number: TE-XXXXXX-0

Location: The properties subject to this Agreement consist of those non-Federal lands in, Washington and Kane Counties, Utah.

Agreement Approved by: Utah Field Office, U.S. Fish and Wildlife Service.

Covered Species: Southwestern Willow Flycatcher.

Report on the Monitoring Program (1-2 paragraphs): Describe in general terms the results of any surveys carried out pursuant to Section 7.A.2 of the Safe Harbor Agreement in the year covered by the report; append a copy of the report. Describe any major changes in the collective condition of Flycatcher habitat included in the baseline or improved as part of the Program Participants' conservation plans. Describe any evidence of utilization of such habitat by the covered species. Append to this report copies of all reports submitted to the Program Administrator by Program Participants since the last annual report.

Date Annual Report is Due: On or before December 31, for the prior calendar year

Date Annual Report was Received:_____

Date Annual Report was Reviewed:_____

Signature of Reviewer:_____

Printed Name and Phone # of Reviewer:_____

Report on Area-wide Management and Conservation Actions (1-2 paragraphs): As necessary to supplement the monitoring reports above, summarize the extent and condition of Flycatcher habitat on the collective enrolled properties. Describe any relevant regional conditions (e.g., drought, flood) that may be required to interpret the management activities described in the appended annual reports from the Program Participants. Finally, please convey any suggestions for adaptive management of project areas that may have emerged from the program so far.

EXHIBIT 3
Annual Report from Program Participant to Program Administrator

Directions: Walk through the conservation area observing overall conditions and paying particular attention to the areas where practices have been applied. You may wish to have your baseline maps and conservation plan handy for reference. Explanations can be brief (one or two sentences).

At the discretion of the Program Administrator, you may substitute for this form a monitoring report provided to you by a biologist or conservation professional familiar with the southwestern willow flycatcher.

Condition of Southwestern Willow Flycatcher Habitat

1. Please circle the types of management activities that you will be implementing as part of this Agreement.
- Planting of native trees or shrubs
- Fencing or other measures to prevent or control livestock access to riparian areas
- Prescribed grazing to adjust livestock grazing periods and stocking rates
- Control of nonnative species as part of a restoration program
- Restoring or enhancing the physical and biological functions of the stream
- Restoring floodplain wetlands

2. List which of these activities have been implemented this year and note whether they differed significantly from the activities described in Exhibit B of your Cooperative Agreement. If the activities were significantly different, explain why.

3. For each activity listed in No. 2, indicate which month it was completed, and indicate what work remains to be completed.

4. What is the general condition of the restored habitat (i.e., do southwestern willow flycatchers nest at the site, height of vegetation, condition of seeded plants, etc.)? Please comment separately on each management activity implemented.

5. Has the extent of the area of suitable habitat available for southwestern willow flycatchers changed within the past year? For example, has the area expanded naturally or has it markedly decreased due to fire, flood, drought, or other natural events?
- Expanded ___
- Decreased ___
- Stayed the same ___

Please explain briefly the extent and causes of any noticeable increase or decrease.

6. Have you noticed any change in the types or numbers of birds, or other wildlife in the restored area? If so, please describe these briefly.

7. Has the Program met your expectations? Please explain.

8. Would you recommend the program to others?