

Southwestern Willow Flycatcher Declines In Grand Canyon National Park

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The southwestern willow flycatcher (*Empidonax traillii extimus*) is a riparian obligate species whose population has severely declined in recent decades. Factors in the decline include loss and fragmentation of riparian habitat, loss of wintering habitat, increased invasion of riparian corridors by the exotic tamarisk (*Tamarix spp.*), brood

parasitism by brown-headed cowbirds (*Molothrus ater*), and predation (Whitfield 1990, Harris 1991, Rosenberg et al. 1991).

The states of Arizona, New Mexico, and California comprise most of the southwestern willow flycatcher's historic and current range. Each of these states list the subspecies as endangered (Arizona Game and Fish Department 1988, New Mexico Department of Game and Fish 1988, California Department of Fish and Game 1991). In addition, the bird is listed by the USFWS as a candidate category 1 species (56 FR 58804). The USFWS was petitioned in January 1992 to list the subspecies as endangered.

Although once distributed along most major river systems in Arizona (Phillips 1948, Unitt 1987), only three areas are known to have been occupied by nesting southwestern willow flycatchers in the past 10 years. These are the lower San Pedro River, the Verde River, and the Colorado River in Grand Canyon NP (Hunter et al. 1987, Unitt 1987, Brown 1988, and USFWS unpublished data). Of these areas, Grand Canyon NP hosted the greatest number in the 1980s, with a maximum estimate of 11 males in 1986 (Brown 1988). However, this small number had declined in recent years to only two singing males (pairs) in 1991 (Brown 1991).

The southwestern willow flycatcher is a neotropical migrant that arrives in the Grand Canyon around May of every year. The breeding season continues through July and has been known to last through the first week of August. Nesting sites in the Grand Canyon are mainly confined to an introduced shrub, tamarisk (*Tamarix ramosissima*). Of 12 nests studied from 1986 to 1988, all were located in tamarisk (Brown 1988). In addition, marsh plants such as cattails (*Typha spp.*) are often part of their territories and foraging habitats (Unitt 1987).

Clutch size of southwestern willow flycatchers along the Colorado River is typically smaller than in other races of the bird: Of 28 unparasitized nests, 18 percent had two eggs, 82 percent had three eggs, and none had four (Brown 1988).

The willow flycatcher song, a "fitz-bew," distinguishes it from several other hard to identify *Empidonax* species. This flycatcher also produces a "whit" call in conjunction with the "fitz-bew," which it will use during defense of its nest or territory. Singing begins in the spring as soon as the birds arrive and establish their breeding territories, and usually ceases in July, well before their fall departure.



Field researcher records the song of a willow flycatcher.

Breeding habitat in the Grand Canyon, preferred by the southwestern willow flycatcher.



Southwestern willow flycatcher surveys were conducted along the Colorado River within Grand Canyon National Park from mid-May through July, 1992 to determine presence and abundance of this declining subspecies. These surveys were coordinated by the NPS/CPSU at Northern U/AZ, and were a cooperative effort among the NPS, USFWS, Bureau of Reclamation, and the AZ Game and Fish Dept. Hualapai Tribe. Willow flycatcher presence was determined by sightings and song detections made from approximately 5:30 to 11 a.m. daily, when male song-rates are typically greatest (Unitt 1987). In some cases, surveys were also conducted at dusk, a period during which willow flycatchers may display a secondary peak of singing (Weydemeyer 1973). In order to maximize the likelihood of detecting willow flycatchers, surveyors used tape-broadcast songs of willow flycatchers—a proven method for eliciting a vocal response from nearby resident flycatchers (Seutin 1987, Craig et. al 1992).

Once flycatchers were detected, they were observed very closely in order to determine breeding activity. Male singing rates (songs/minute) were recorded during this observation period to provide information on daily and seasonal variation in song-rates. Nesting status was verified by inspection of the nests and then by re-inspection on subsequent survey trips. Clutch size, number and age of young, and presence of cowbird eggs or young were also noted.

During 1992, agency personnel and experienced volunteers conducted over 256 hours of surveys in 132 habitat patches along the Colorado River corridor. Only seven southwestern willow flycatchers were detected. Two pairs were found at Cardenas Marsh (River Mile 71.1). One of these pairs produced a complete clutch of three eggs with no evidence of brood parasitism by brown-headed cowbirds. Three healthy nestlings from this clutch were observed in late June, and a juvenile and an adult were detected foraging during a third visit in late July. Unfortunately, the second pair showed no sign of successful breeding. Three unpaired willow flycatchers also were observed at different sites along the river corridor. Since the Grand Canyon is part of a migratory route for other races of willow flycatchers, these three unpaired birds could possibly be migrant visitors. However, these birds were observed in the same habitat patch on consecutive days, and the sightings occurred when migrants were no longer expected within the park.

Vocalization and habitat use information were collected on the willow flycatchers found at Cardenas Marsh. Data were gathered on male song rate to determine differences in

daily and seasonal song frequency. A parabolic recorder was utilized to tape vocalizations by the male and female flycatchers responding to the tape broadcast. The recorded vocalizations will be sent to the Borror Lab of Bioacoustics at Ohio State University, where specialists will determine if the southwestern willow flycatcher vocalizations differ from those of the other subspecies.

Several factors could explain the decline of the southwestern willow flycatcher along the Colorado River in the last two decades. These factors include cowbird parasitism and a variety of human-related disturbances. Although we found no evidence of brown-headed cowbird eggs or nestlings inhabiting willow flycatcher nests during this study, approximately half of the nests examined during the 1980s in the same study area were parasitized by cowbirds (Brown 1988). The cowbird population in the canyon is large, and poses a threat to many birds. Cowbird control is just one option that may be beneficial to the willow flycatcher, and to many other highly parasitized birds of the Grand Canyon.

Fluctuations in flow release from Glen Canyon Dam also may affect the numbers of southwestern willow flycatchers along the Colorado. Long-term indirect habitat changes brought about by controlled flows (e.g. habitat expansion or fragmentation, changes in plant species composition, and changes in patch size or configuration) could affect willow flycatcher breeding ecology by increasing or decreasing suitable habitat.

Human-related activities along the river corridor also could affect this sensitive bird. Recreational use of the canyon can impact flycatchers by direct degradation of riparian habitat, or disturbance from noise and activity associated with nearby campers. Although the willow flycatcher is one of seven species negatively associated with campgrounds in riparian areas in northern Utah (Blakesley and Reese 1988), the birds have been found near campsites along the Colorado River corridor. The fact that these birds are found near campers may suggest they are tolerant of nearby human activity. However, repeated human presence within a territory or close to an occupied nest could cause the birds to abandon a territory or nest.

Grazing has been shown to reduce the quality of riparian flycatcher habitat (Taylor 1986, Sanders and Fleet 1989). Although grazing is not a direct threat to riparian corridors within Grand Canyon NP, grazing does occur directly adjacent to the park on some lands near the park, and could be affecting the regional flycatcher population by reducing potential habitat.

The possibility of listing the southwestern willow flycatcher as an endangered species, coupled with its small population size and apparent widespread decline, demonstrates the need for continued monitoring along the Colorado River corridor. Future willow flycatcher surveys will provide valuable information needed to continue monitoring population trends, and will further define habitat use along with potential threats.

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