Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

NMPIF level: Species Conservation Concern, Level 1 (SC1)

NMPIF assessment score: 21

NM stewardship responsibility: High

National PIF status: Watch List

New Mexico BCRs:16, 34, 35

Primary breeding habitat(s): Southwest Riparian, Middle-elevation Riparian

Other habitats used: Montane Riparian

Summary of Concern

The southwestern subspecies of the Willow Flycatcher has been federally listed as endangered since 1995, with critical habitat being designated in 2005. It is one of four recognized subspecies of the Willow Flycatcher and breeds only in dense riparian habitats in the southwestern United States. In New Mexico, the species is found primarily along the Gila River and Rio Grande drainages. It is vulnerable to the loss, fragmentation, and modification of riparian breeding habitat, including the removal of exotic vegetation along the Rio Grande, where nesting in salt cedar is a regular occurrence (Moore and Ahlers 2006).

Associated Species

Bell's Vireo (SC1), Yellow-billed Cuckoo (BC1), Yellow Warbler, Yellow-breasted Chat, Blue Grosbeak

Distribution

All four recognized Willow Flycatcher subspecies occur in New Mexico during migration and are indistinguishable except in the hand (Yong and Finch 1997). However, all breeding Willow Flycatchers in the state can be assumed to be the southwestern subspecies (Sogge et al. 2003). Southwestern Willow Flycatcher is known to breed only in Arizona, New Mexico, southern California, southwestern Colorado, and the extreme southern portions of Nevada and Utah (Sogge et al. 1997). Probable historical breeding records exist from extreme northern Sonora and Baja California, Mexico (Unitt 1987, Wilbur 1987) and far western Texas, but there are no recent data from these areas (Sogge et al. 2003).

In New Mexico, Southwestern Willow Flycatcher breeds almost exclusively along the Gila River and Rio Grande. Scattered historical breeding records are also known from the Canadian, Chama, San Francisco, San Juan and Zuni River drainages (Sogge et al. 2003, Finch and Stoleson 2000). In 2007, all confirmed breeding activity in New Mexico occurred in the Gila and Rio Grande drainages, with the exception of a single breeding site on the San Francisco River (D. Hill, USFWS, pers. comm.).

Ecology and Habitat Requirements

Southwestern Willow Flycatcher breeds in dense riparian habitat, with willow, salt cedar, and box elder being the dominant tree species over 90% of the time (Sogge et al. 2003). Habitat in New Mexico often contains a cottonwood overstory with a shrub understory of native willows and/or exotics such as Russian olive and salt cedar. Although it accounts for 13% of the known territories, the use of box elder dominated habitat is known only from the Gila River, New Mexico. Breeding elevation ranges from sea level to over 2500 meters, but 88% of territories are below 1600 meters, and only 9% are above 2000 meters. A greater variety and distribution of habitats is used during migration, including non-riparian vegetation (Finch and Stoleson 2000).

Along the Gila River, Southwestern Willow Flycatchers nest primarily in areas dominated by box elder, with willow and Russian olive dominated areas used less frequently (Stoleson and Finch 2003). The species almost always used box elder as a nesting substrate where it was dominant (99%), but also used box elder 36% of the time when it was not the dominant tree species. Nest heights along the Gila ranged from 1 to 24 m in height, with an average height of 7.6 m. In the Middle Rio Grande, the species nests primarily in riparian habitat dominated by willow or salt cedar (Moore and Ahlers 2006). Between 1999 and 2006, 80% of nests were in willow dominated territories, 8% were in salt cedar dominated territories, and 12% were in mixed dominance areas. The nesting substrate was most often willow (60%). Nest success was similar in both willow (56%) and salt cedar (54%, Stoleson and Finch 2003). In all areas, nests are placed in vertical or nearly vertical branches of the host substrate (USFWS 2002).

At the Pueblo of Isleta on the Middle Rio Grande, Southwestern Willow Flycatchers nest in an area containing monotypic and multi-species single-stratum native vegetation types and dense exotic types. Although flycatchers at the Pueblo have a choice of habitat types, they have more often nested in vegetation types with cottonwood overstory and dense willow understory (Smith and Johnson 2007). Nesting success has been highest in the two forest types with the densest shrub layers, Mainly Native Dense Forest and Native Dense Forest (60% and 55%, respectively). Over five years of the study, nests were most often placed in Russian olive (n=16), followed by coyote willow (n=1) and salt cedar (n=7). At all height intervals for 2004-2007, vegetation cover was significantly denser at the nest than at the three nearby subplots (Smith and Johnson 2007).

Throughout the southwest, Southwestern Willow Flycatchers nest near lentic water, such as slow moving streams, river backwaters, oxbows, or marshy areas (Sogge and Marshall 2000), and apparently choose nesting territories based in part on the presence of water. In particularly dry years, flycatchers at traditional nesting sites along the Middle Rio Grande nested in reduced numbers relative to wetter years

(Smith and Johnson 2004, 2005) or failed to nest altogether (Johnson et al. 1999). In one New Mexico study, distance of nests from the main river channel was correlated with flow volumes (Brodhead and Finch 2005). In a study from Camp Pendleton, California, 12 of 13 transient male territories were detected within 50 m of the water, but only about half (9 of 17) of breeders were within 50 m. The rest were more than 150 m away (Kus 2000), which suggests that the birds preferred territories not directly adjacent to flowing water. In New Mexico, stream flows (which indicate current and long-term climatic conditions) have been reported to correlate with nest success during two narrow time windows, late June to early July, and late July (Brodhead and Finch 2005). In another recent study on the Middle Rio Grande, 16 of 22 nests (73%) were constructed over standing water or wet soil, and timing of standing water was associated with nesting success (Smith and Johnson 2007).

Southwestern Willow Flycatcher begins arriving in New Mexico in early May, and nest construction occurs from mid-May to mid-July (USFWS 2002). Singing is most common shortly after arrival on the breeding grounds and early in the nesting cycle and declines as the season progresses (Sedgwick 2000). Some males may continue singing into August, even with fledged young present. Incubation occurs from late May to early August, and fledging occurs from late June to mid August. Later fledglings are often the product of re-nesting attempts (Sogge et al. 1997). Re-nesting is a regular occurrence if the first attempt fails and is most likely to occur after success if young fledge by early July (USFWS 2002). Up to six nesting attempts in a season have been documented (Finch and Stoleson 2000).

Clutch size ranges from one to five with an average of three (Finch and Stoleson 2000), and decreases with each nest attempt during a given year (USFWS 2002). In the Middle Rio Grande, the clutch size was 2.64 for nests built in willow (N=249) and 2.47 in salt cedar (N=135, Moore and Ahlers 2006). Diet consists almost entirely of invertebrates, though berries may also be consumed during fall migration (Sedwick 2000). In 1999, the dominant prey taxa in the Cliff-Gila Valley, New Mexico were bees and wasps, with true bugs, flies and beetles also commonly taken (DeLay et al. 2002). The prevalence of specific taxa in the diet apparently varies based on their abundance in a given area or year (Drost et al. 2003).

Conservation Status

Species Assessment

DISTRIBUTION	5
THREATS	4
GLOBAL POPULATION SIZE	3
LOCAL POPULATION TREND	4

IMPORTANCE OF NEW MEXICO TO BREEDING	5
COMBINED SCORE	**21**

Southwestern Willow Flycatcher is a Species Conservation Concern, Level 1 species for New Mexico, with a total assessment score of 21. It receives a high vulnerability score of 5 for its relatively limited distribution and population size. Southwestern Willow Flycatcher is a federally listed endangered subspecies.

Population Size

Size of the New Mexico population in 2007 was estimated at 800-900 birds, based on the documentation of approximately 514 territories and 403 nests (D. Hill, USFWS). The total species population is estimated at 1,200 territories or approximately 2,400 individuals (Durst et al. 2006). About 32% of the global population is thought to occur in New Mexico. Breeding densities are highly variable. Southwestern Willow Flycatchers are often loosely colonial, but single territories also occur (Finch and Stoleson 2000). In 1995, breeding densities in the Cliff-Gila Valley ranged from 5.6 territories/ha to 0.31 territories/ha (Skaggs 1996).

Population Trend

No significant BBS data are available. Range-wide population trends are obscured by variations in annual survey effort and locations, making it difficult to determine if the population is increasing, decreasing, or stable (Sogge et al. 2003). However, Southwestern Willow Flycatcher territories have disappeared from 133 of 275 sites monitored since 1993 (Durst et al. 2006). In New Mexico, the population has decreased over the past century, with losses most severe along the Rio Grande near Espanola and Las Cruces, where suitable habitat no longer occurs (USFWS 2002).

Threats

The primary threat to Southwestern Willow Flycatchers in New Mexico is the loss, alteration, and fragmentation of densely vegetated riparian breeding habitat (Finch and Stoleson 2000, Sogge et al. 1997). Habitat losses and changes have occurred due to urban, recreational and agricultural development, water diversion, impoundment and channelization, and livestock grazing. The replacement of native vegetation by exotics is also a potential threat, though breeding does regularly occur in non-native vegetation, especially salt cedar (e.g., Durst et al. 2006, Moore and Ahlers 2006, Sogge et al. 2003, Stoleson and Finch 2003). Any hydrological changes, whether natural or human-caused, can greatly reduce the quality and amount of breeding habitat, as can fire.

The Southwestern Willow Flycatcher is one of several declining species that apparently have been impacted by Brown-headed Cowbird nest parasitism (USFWS 2002, Rothstein and Robinson 1994, Holmes 1993). Among Southwestern Willow Flycatcher populations, cowbird impact varies widely. In New Mexico, reported rates vary from 18% in the Cliff Gila Valley to 40% at other sites (USFWS 2002).

Cowbird parasitism rates are typically lower in large patches of unfragmented habitat (Robinson et al. 1995). In general, parasitism rates and cowbird densities typically decline with increasing densities of low vegetation, probably because nests in dense vegetation are harder for cowbirds to find (USFWS 2002, Uyehara and Whitfield 2000, Staab and Morrison 1999, Larison et al. 1998). In one New Mexico study, cowbirds only parasitized nests in narrow habitat patches with large edge components and snags that provided perches for cowbirds (Smith and Johnson 2007).

Management Issues and Recommendations

Management for Southwestern Willow Flycatcher in New Mexico should focus on the recommendations made in the federal recovery plan (USFWS 2002). This includes the preservation of dense riparian breeding habitat, including areas dominated by exotic vegetation where breeding occurs, and the restoration of potentially suitable breeding habitat.

NMPIF Recommendations

- Increase and improve currently suitable and potentially suitable breeding habitat (USFWS 2002).
- Conserve and manage all known flycatcher breeding sites (USFWS 2002).
- Avoid the removal of exotic vegetation (e.g., salt cedar, Russian olive) in areas where flycatchers are nesting. Non-native vegetation should be removed only if it is part of a larger restoration plan, if it will be replaced with vegetation of a higher functional value, and there is evidence that native vegetation will replace the removed non-native stand (USFWS 2002).
- Conduct annual flycatcher surveys in occupied areas and in unoccupied areas with suitable habitat in order to monitor the effects of management and restoration practices, and to document flycatcher dispersal, colonization, and the progression of habitat suitability (USFWS 2002).
- Monitor nests where pairing activity is documented (Moore and Ahlers 2006).
- Re-establish and maintain the physical integrity of rivers in nesting and potential nesting habitat in order to maintain and/or restore the vegetation characteristics required for nesting success (USFWS 2002).
- Increase the amount and quality of riparian habitat to increase habitat patch sizes, thereby minimizing the impacts of cowbird parasitism (USFWS 2002).

- Conduct research to determine the habitat characteristics that influence occupancy and reproductive success (USFWS 2002).
- Reduce cowbird impacts by maintaining large patches of dense riparian vegetation with minimal edge. Researchers should avoid checking nests when cowbirds are present.

Species Conservation Objectives

NMPIF Objectives

- Increase the number of territories present in areas with current or potentially suitable habitat, including the Gila River, Rio Grande, San Francisco River, San Juan River, and Zuni River, to meet the requirement for reclassification from endangered status (USFWS 2002).

Sources of Information

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