



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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Status of Southwestern Willow Flycatcher

in the White River Drainage, Nevada

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November 2007

Status of Southwestern Willow Flycatcher in Nevada

The southwestern willow flycatcher (*Empidonax traillii extimus*) is one of four recognized willow flycatcher subspecies (Phillips 1948, Unitt 1987, Browning 1993). The subspecies are distinguished primarily by subtle differences in morphology and color, and by habitat use. The current breeding range of the southwestern willow flycatcher includes southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and extreme northwestern Mexico (U.S. Fish and Wildlife Service [Service] 2002). The current range is similar to its historical range, but the quantity of habitat available within its current range is reduced from historical levels. The flycatcher occurs at elevations ranging from near sea level to approximately 8500 feet, but is typically found in lower elevation riparian habitat.

The Service listed the southwestern willow flycatcher as an endangered species on February 27, 1995 (Service 1995). Critical habitat was designated on July 22, 1997 (Service 1997). On May 11, 2001, the 10th circuit court of appeals set aside set aside the critical habitat designation in New Mexico, and the Service subsequently set aside critical habitat designation in all other states until a revised economic analysis was completed. Critical habitat was redesignated on October 19, 2005, including 737 river miles across southern California, Arizona, New Mexico, southern Nevada, and southern Utah in the final designation. The primary constituent elements of critical habitat are based on the presence of riparian plant species, structure and quality of habitat, and density of insects for prey. The final rule also describes the variety of river features and processes necessary to maintain the primary constituent elements, including but not limited to, broad floodplains, water, saturated soil, hydrologic regimes, elevated groundwater, and fine sediments (Service 2005).

Surveys for flycatchers have been conducted in Nevada since 1996, and in the Pahrnagat Valley since 1998. Breeding populations have been documented on the Pahrnagat National Wildlife Refuge (NWR) and Key Pittman Wildlife Management Area (WMA). Flycatchers are also known to breed on private land in the Pahrnagat Valley, but population estimates are not available due to restricted access to the properties. The latest surveys conducted in Pahrnagat Valley for which data is available documented 29 individuals, 15 pairs, and 18 nests with a 60 percent success rate (at least one chick successfully fledged) at Paranagat NWR (McLeod et al.



2007), and 16 individuals, 7 pairs, and 11 nests with a 54 percent success rate at Key Pittman WMA (Nevada Department of Wildlife [NDOW] 2007).

Flycatcher Distribution in Nevada and the White River Drainage

In Nevada, southwestern willow flycatchers breed in riparian vegetation along the Virgin River in Clark County, upper and lower Muddy River in Clark County, Pahranaagat Valley and the Meadow Valley Wash in Lincoln County, and at Ash Meadows NWR in Nye County. Flycatcher surveys have been conducted in the Las Vegas Wash in Clark County since 1999 (SWCA Environmental Consultants 2005); however, to date, breeding activity has not been observed and subspecies type has not been confirmed.

Southwestern willow flycatchers are known to breed in riparian vegetation in the Pahranaagat Valley. Flycatchers have been detected at the middle and northern ponds at the Pahranaagat NWR (Koronkiewicz 2006), on private lands located within the vicinity of the towns of Alamo and Ash Springs, at Crystal Springs, and at Key Pittman WMA (NDOW 2003).

The Southwestern Willow Flycatcher Recovery Plan established six Recovery Units (RUs) within the range of the flycatcher, which were further subdivided into Management Units (MUs). The Recovery Plan sets population goals at the range wide, RU, and MU levels to ensure that territories are geographically distributed throughout the range of the species to allow proper functioning as metapopulations, reducing the probability of extinction. The Pahranaagat Valley is located within the Pahranaagat MU, which is one of seven MUs established within the Lower Colorado RU. Population goals for the Lower Colorado RU are set at 525 territories, and at 50 territories for the Pahranaagat MU (Service 2002b). As of 2005, the total known number of territories within the Lower Colorado RU was estimated at 151, and in the Pahranaagat MU at 39 territories, representing more than 25 percent of the total number of territories known to occur within the RU (Durst et al. 2006).

Flycatcher Ecology and Habitat Requirements

Southwestern willow flycatchers breed in riparian vegetation that develops in areas with lentic water flow or saturated soils. Suitable breeding habitat is characterized by the presence of relatively thick vegetation with a dense canopy. Common native plant species used as nesting habitat include Fremont cottonwood (*Populus fremontii*), Gooding willow (*Salix goodingii*), and coyote or sandbar willow (*S. exigua*). In locations where nonnative vegetation has invaded riparian areas, flycatchers also nest in saltcedar (*Tamarix* sp.) and Russian olive (*Eleagnus angustifolia*).

Riparian vegetation in the Pahranaagat Valley is comprised predominantly of native vegetation, with scattered pockets of Russian olive and saltcedar. Flycatchers nest in Gooding willow and cottonwood at the Pahranaagat NWR, and in coyote willow on private land and at Key Pittman WMA.

Selection of suitable breeding territories is thought to be based on factors such as vegetation height, canopy structure, understory density, patch size and shape, and plant species composition. Another characteristic common to most all occupied sites is the presence of lentic water or saturated soil (Service 2002c). Hydrogeological conditions such as slow moving stream reaches flowing through broad floodplains with low gradient slopes, separated oxbows forming swampy backwaters, and margins of impounded water assist in forming and maintaining habitat characteristics favored by flycatchers. Observed associations between flycatchers and quiet waters is most likely a representation of the relationship between the flycatchers' requirements for certain habitat characteristics, and the hydrological conditions required to maintain those habitat characteristics.

Threats to the Species

The primary cause of flycatcher population decline is the loss and modification of its habitat (Service 2002d). Range wide, factors contributing to habitat loss include operation and maintenance of dams and reservoirs, diversions and groundwater pumping, channelization and bank stabilization, agricultural development and livestock grazing, phreatophyte control, recreational activities, urban development, and fire (Finch and Stoleson 2000).

In Nevada, flycatcher habitat along the Virgin and Muddy Rivers, and Meadow Valley Wash was disturbed by flooding in January 2005, and efforts by local communities and transportation agencies to repair and prevent further damage to properties affected by the floods (BioWest, Inc. 2005, Koronkiewicz et al. 2006). In the City of Mesquite, construction of new housing and golf courses has resulted in removal of riparian vegetation along the Virgin River. Flood control projects planned for the community of Overton in Clark County, and the City of Caliente in Lincoln County will also result in the removal of riparian vegetation suitable for breeding flycatchers. Other threats to the species include predation and brood parasitism, demographic effects of small populations, and loss of stopover and wintering range habitat.

Conservation Efforts

Several programs have been initiated in southern Nevada to improve habitat conditions along major waterways. The Clark County Multiple Species Habitat Conservation Plan funded saltcedar removal and native plant restoration along the upper Muddy River in the early 2000's. The Bureau of Land Management funds an ongoing saltcedar removal program along the Virgin River in the vicinity of the City of Mesquite, and also along the Meadow Valley Wash in Lincoln County. Nevada Department of Wildlife works with private landowners in Pahrnagat Valley to remove Russian olive trees. Restoration efforts funded by Southern Nevada Water Authority in the Las Vegas Wash have been successful in replacing saltcedar with native riparian species such as willow and cottonwood. However, to date, no information is available on the success of these restoration projects in providing habitat favorable for breeding flycatchers.

Effects from Groundwater Development Projects

Depletion of groundwater supplies has a direct effect on the persistence and maintenance of riparian vegetation in the desert southwest. The distribution of dense native vegetation in drier environments is restricted to floodplains along rivers and streams and the edges of impounded water features such as dams and ditches, because plants have access to relatively shallow ground water and higher soil moisture content that is required for development and maintenance of dense vegetation typical of riparian habitat favored by flycatchers. Native riparian trees are highly sensitive to changes in groundwater levels, and rapid changes in groundwater levels can kill trees in a short period of time (Kirkpatrick et al. 2007).

Paradzick (2005) demonstrated the relationship between vegetation structure linked with flycatcher habitat selection and hydrogeomorphic variables. Out of 5 key vegetation structural variables common to flycatcher habitat, 4 were related with at least one hydrogeomorphic variable, and of these, depth and fluctuation in groundwater showed the strongest relationship with 3 of the 5 variables (foliage density at 7 to 9 meters, willow stem density, and amount of forest surrounding a habitat patch). Brodhead (2005) also demonstrated that flycatchers occur in areas with more riparian cover and greater horizontal structural complexity. Changes in hydrological conditions that affect these vegetation characteristics will result in alteration in use or abandonment of the habitat by flycatchers.

 11/13/07

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