

greater than 3.2 km (2 miles) above the ground during these movements. Wherever an individual went, it usually had a choice of different flocks heading in the same direction. These flocks were dynamic in nature, with individuals intermittently leaving and joining. Often our subjects would join several different flocks during the course of a cross-country movement. Round trips exceeding 322 km (200 miles) were a common occurrence. It was also noted that on days of inclement weather with little or no thermal activity, birds were capable of making these trips under their own power. Fewer birds made such movements on those days, however, and we suspect the demands of feeding young provided the impetus for those involved.

While we observed fairly consistent numbers of American White Pelicans in Lahontan Valley during our core study period, our research suggests they were not always the same individuals. There is apparently a previously unsuspected degree of interchange among American White Pelicans in different parts of the inter-mountain west. Non-breeding adults, which are not tied to an area by nesting demands, might stay in one place for only the briefest of periods. The movements of 11982 (Figure 1), by all indications a non-breeder in 1997 and 1998 during the spring and summer months of both years, demonstrate that even a single individual may have no set pattern to its wanderings from year to year.

American White Pelicans were observed to engage in significant travels for reasons that were not apparent. One non-breeder joined a flock leaving Carson Lake for Pyramid Lake and then returned to its point of departure with another flock, never having landed. This bird might have made the 161 km (100 mile) round trip because it was drawn to the behavior of the flock, or to gather information for future foraging or breeding activities.

In 1997 six of the eight subjects with transmitters active into the late fall used the Salton Sea for varying periods. In 1996 transmitters did not last long into the fall, but at least two of the six birds used the Salton Sea. During August-November 1996, over 8500 American White Pelicans (estimated at 10% of the western population) died during a major outbreak of botulism at the Sea. Of 161 banded birds recovered during the die-off, 87 (54%) had been banded at Pyramid Lake. Our data further illustrate the connection between these two areas and the vulnerability of Nevada's breeding population to the ongoing problems in the Salton Sea ecosystem.

Our results have given us information on movement capabilities and inclinations of this species, and the sometimes dramatic influences of weather. On August 5, 1996 Nevada experienced an unusual summertime upper-level trough, with winds aloft occasionally reaching over 64 kph (40 mph) from the southwest and west-southwest. Number 5717 left the Fallon area sometime after 0919, and was to the north of the Great Salt Lake within ten hours. Over the final 2.5 hours of the journey it averaged almost 113 kph (70 mph), obviously aided by a significant tailwind. In 1996 number 11982 made seven round trips to California's Central Valley, each of which involved two crossings of the Sierra Nevada range. In 1997 number 5718, a breeder, had already made three such round trips when its transmitter inexplicably went off the air after one month.

In summary, we found the American White Pelican to be a highly mobile species.

capable of and inclined to travel at altitudes and speeds that belie its cumbersome and deliberate stereotype.

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Status of the Northern Goshawk in the Great Basin

Gary Herron, Nevada Division of Wildlife

Introduction

The Northern Goshawk (*Accipiter gentilis*) is the largest of the accipitrine hawks and is closely associated with riparian, forested habitats. The name is derived from the Old World name of "grouse-hawk," shortened centuries ago to goshawk. The goshawk is circumpolar in distribution with nesting activity in North America restricted primarily to the western and northern United States, Canada and Alaska. Wintering birds can be found as far south as northern Mexico. Because of the hawk's secretive nature and the relatively secluded forested areas that it inhabits, it was initially classified as a very rare nesting species in Nevada by many ornithologists. However, over two decades of surveys since 1974 have resulted in locating over 250 nesting territories that were occupied by adults. In 1985 the Division of Wildlife estimated that there were approximately 300 nesting pairs present in the State. That estimate appears to have been conservative.

A typical goshawk nest site in Nevada is located in an aspen stringer at least 600 feet long and from 75 to 300 feet wide. Almost without exception there is never more than one goshawk nesting territory located in a single drainage. The distance between drainages containing suitable nesting habitat may vary from one-half mile to over 10 miles. The majority of nesting occurs near small perennial streams at approximately 7400 - 7800 feet in elevation. Over 90 percent of documented nests are located in aspen. Since most surveys have been conducted in aspen communities, conifer nest sites are undoubtedly under represented in the survey data.

A typical nest is over 30 inches in diameter and is constructed in a mature tree (35-50 feet tall) and positioned in an upper crotch near the trunk, below the canopy top. There are usually numerous nests that were constructed in previous years within a

nesting territory. These alternate nests are often repaired and used again. Two to four unmarked bluish-white eggs are laid from mid-April to early June. The eggs hatch after about 28 days of incubation and the young hawks remain in or near the nest for about seven weeks. Production data gathered from over 150 nest sites resulted in an average of 2.2 young goshawks per nesting attempt reaching at least four weeks of age. Very aggressive parent birds make it quite clear to an intruder that they will not be tolerated anywhere near the nest.

Prey preference for nesting goshawks is determined from examination of food remains and pellets below the nest and nearby perches. Small mammals appear to be the most important food group for nesting goshawks, with the belding ground squirrel, the golden-mantled ground squirrel and the cottontail rabbit being the most common prey items. Birds that frequently appear in the diet are the Northern Flicker, Steller's Jay, and Pinyon Jay. Prey selectivity appears to be dependent upon species abundance, vulnerability, and size. The most common hunting methods are watching from a perch or flying low through forested or brushy habitat. When vulnerable prey is located the pursuit is usually short and swift.

Status

During the last decade there has been a considerable amount of concern about the status of nesting goshawks in the western United States. On July 19, 1991 the U.S. Fish and Wildlife Service (Service) received a petition from the Maricopa Audubon Society, Phoenix, Arizona, to list the Northern Goshawk as an endangered species in Utah, Colorado, New Mexico, and Arizona. Two months later the petition was amended to include three additional Audubon Chapters and seven conservation organizations. The eleven member coalition also requested that the petition expand the geographic region under consideration to include the "forested west." The forested west was subsequently defined as the forested United States west of the 100th meridian.

On June 25, 1992 the Service determined that the petition did not present substantial information to indicate that the Northern Goshawk in the western United States was a listable species. The Service found that the petition did not provide evidence of reproductive isolation or genetic differentiation between the goshawk in the west and the goshawk in the eastern United States. The petitioners subsequently filed suit to have the Service's finding set aside. The United States District Court ruled that the finding was arbitrary and capricious and remanded it to the Service for re-evaluation.

On June 6, 1996 the Service again determined that the petition did not present substantial information for listing. The Service found that the goshawk was comprised of more than one subspecies and did not meet the definition of a distinct vertebrate population segment. Once again the petitioners filed suit and the court disallowed the finding.

On September 29, 1997 the Service determined that the petition provided substantial information indicating that the listing of the Northern Goshawk as threatened or endangered may be warranted. At that time the Service initiated a Status Review for the species. For purposes of analysis, the area identified in the petition was broken into 6

assessment areas. Nevada was included in an assessment area that also covered Utah, southwestern Wyoming, and the southern two thirds of Idaho.

All states west of the 100th meridian provided the Service with their most current population evaluation. Based on these data, the Service did not find evidence of a declining population trend for Northern Goshawks. While the Service did find that forest management (e.g., timber harvest and fire suppression) has altered vegetation characteristics throughout much of the western United States, the available data indicate that goshawks remain widely distributed. The current distribution approximates the historical distribution of nesting goshawks, and there is no evidence of any significant areas of extirpation. Also, the petition relies largely on the precept that the goshawk is dependent on large, unbroken tracts of "old-growth" and mature forest. The information provided by the western states does not support this assumption. Although goshawks frequently use stands of old-growth and mature forest as an important component of their nesting habitat, the species appears to be more of a forest habitat generalist. The goshawk uses a variety of forest types of different ages to meet its nesting and foraging requirements. The goshawk uses patches of mature trees for nesting within a mosaic of multi-aged habitats.

Nevada Division of Wildlife biologists have not monitored a sufficient number of goshawk nests in recent years to properly evaluate occupancy and nesting success. Small random samples (8-12) of historical nesting territories have been surveyed three times between 1988 and 1997. There was about a 70 percent occupancy rate during the first two surveys. A trend survey of eight historical nesting territories was conducted on three mountain ranges in northeastern Nevada during 1997 and resulted in a 63 percent occupancy rate. The Division plans to emphasize goshawk nesting surveys in northeastern and central Nevada during 1999. Approximately thirty historical nesting territories will be evaluated. To adequately assess nesting trends in Nevada, a minimum of three years of intensive surveys of known nesting territories would be required. When more funding becomes available, additional trend surveys will be initiated.

In 1991, The Raptor Research Center at Boise State University began a study to examine possible impacts of gold mining activity on breeding Northern Goshawks in the Independence and Bull Run Mountains of Northeastern Nevada. During the initial year of the study, 14 occupied nesting territories were located. In subsequent years the total climbed to 37 territories. During years when prey species are abundant, occupancy rates average about 76 percent for the 37 known territories, which is well within the parameters for a healthy population.

Conclusion

Based on the information provided by the western states, the Service determined that the listing of the Northern Goshawk in the contiguous United States west of the 100th meridian is not warranted.

Although the Nevada Division of Wildlife does not presently have adequate data to determine Northern Goshawk nesting status throughout Nevada, there is no evidence of

population declines that would suggest that the population should be listed as threatened or endangered. There continues to be some loss of nesting habitat, but land management practices are improving in many areas, especially in and near riparian vegetation. Although there is a continuing loss of riparian aspen vegetation in some areas, the rate of loss is declining and this important habitat type is being emphasized in land use planning. If land use management practices continue to improve, the Northern Goshawk will remain an integral part of our wildlife heritage in the Great Basin.



The Southwestern Willow Flycatcher: An Update

John Swett, U.S. Bureau of Reclamation

Introduction

The Southwestern Willow Flycatcher (*Empidonax traillii eximius*) is one of five subspecies of Willow Flycatcher that breed in the United States (USFWS, 1997). In Nevada, the southwestern Willow Flycatcher is believed to breed from the Pahranaagat Valley west to Ash Meadows and south to the Colorado River (Unitt, 1987; McKernan, pers. comm.; St. George, pers. comm.). *Empidonax traillii adustus* and, to a lesser extent *E. t. brewsteri*, are also known to breed in portions of northern Nevada (Unitt, 1987).

Historically, the southwestern Willow Flycatcher was believed to be a fairly common breeder in the riparian areas along the Colorado River and its tributaries, from southern Utah, southwestern Colorado, and southern Nevada to northern Sonora and Baja California, Mexico (Unitt, 1987; Schlorff, 1990; USFWS, 1997). Southwestern Willow Flycatchers nest in riparian habitat characterized by a dense stand of intermediate sized shrubs or trees, such as willows (*Salix* sp.), usually with an overstory of scattered larger trees (Tibbitts et al., 1994). Nesting habitat almost always contains or is adjacent to water or saturated soil (Muiznieks et al., 1994). Most of the historical habitat has been lost or altered over the past century due to river regulation and channelization, agricultural and urban development, mining, road construction, and overgrazing (Phillips et al., 1964; Johnson and Haight, 1984; Unitt, 1987; Rosenberg et al., 1991; Tibbitts et al., 1994). Habitat fragmentation has resulted in an increase in Brown-headed Cowbird (*Molothrus ater*) parasitism (Unitt, 1987; Brown, 1988; Rosenberg et al., 1991; Sogge et al., 1993). Invasion by the exotic saltcedar (*Tamarix* sp.), and the subsequent change in wildfire frequency, has drastically altered riparian ecosystems throughout the Southwest.

Southwestern Willow Flycatcher populations have apparently declined from historical numbers. In recent years, the southwestern Willow Flycatcher was believed to be extirpated from the lower Colorado River and its tributaries; however, birds were observed in several locations as early as 1993 (Hunter et al., 1987; Rosenberg et al., 1991; Sierra et al., 1995). On February 27, 1995, the U.S. Fish and Wildlife Service listed the

southwestern Willow Flycatcher as endangered (60FR10694), prompting the Bureau of Reclamation, as well as several partners including Nevada Division of Wildlife, Southern Nevada Water Authority, National Park Service, and U.S. Geological Survey, to intensify ongoing survey efforts and to initiate additional surveys and studies with the ultimate purpose of improving the status of the subspecies.

Status

In 1996, the San Bernardino County Museum (SBCM), under an agreement with the Bureau of Reclamation, initiated a comprehensive study effort to determine the distribution, abundance, requirements for life and nesting success, and habitat affinities of the southwestern Willow Flycatcher along the lower Colorado River from Lake Mead to the border with Mexico. In 1997, this effort was expanded to include por-

tions of the Grand Canyon and the Virgin River. In 1998, the Pahranaagat Valley and Meadow Valley Wash were also included in the SBCM survey effort. The results for the southern Nevada sites are shown in Table 1.

Interesting results have been obtained through SBCM's work to date. Although southwestern Willow Flycatcher nesting had been documented in *Tamarix* stands above 2000 feet elevation in Arizona, it was initially hypothesized that *Tamarix* did not provide the thermal cover needed for successful breeding below 2000 feet (Hunter et al., 1987; Hunter et al., 1988). This, in fact, has not proven to be the case. Almost 40% of the known breeding sites within the study area are dominated by *Tamarix*. The area with the highest concentration of nesting southwestern Willow Flycatchers along the lower Colorado River is situated at Topic Marsh on Halves National Wildlife Refuge near Needles, California. The riparian vegetation at Topic Marsh contains over 90% saltcedar (McKernan and Braden, 1998).

Stand density may not be as important a factor as originally believed. At least one site containing nesting Willow Flycatchers, the Mormon Mesa site along the lower Virgin River, has a canopy closure of less than 50%. Initially, it was believed that the breeding season for southwestern Willow Flycatchers ranged from early June to late July and that, typically, Willow Flycatchers raised one brood per season (Tibbitts et al., 1994; Unitt, 1987). This study has documented southwestern Willow Flycatchers raising two or even three broods well into August (Braden and McKernan, 1998). Changes in vocalization

TABLE 1. Results of Southwestern Willow Flycatcher Surveys in Southern Nevada, 1996-98.

Location	YEAR (PAIRS/NESTS)		
	1996 (p/n)	1997 (p/n)	1998 (pn)
Muddy River Delta	*	2/2	*
Virgin River Delta	*	6/14	9/4
Mormon Mesa	*	2/3	11/10
Mesquite	*	3/5	2/6
Pahranaagat Valley	*	*	9/18
Meadow Valley Wash	*	*	1/2
Ash Meadows	1/1	1/1	1/1
*Not surveyed			