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SOUTHWESTERN WILLOW FLYCATCHER (*EMPIDONAX TRAILLII EXTIMUS*) POPULATION TRENDS AT THE GILA LOWER BOX, NEW MEXICO

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Abstract.—Southwestern Willow Flycatchers (*Empidonax traillii extimus*) are an endangered obligate riparian breeding bird species of the desert southwest. Population declines leading to listing have been linked to habitat degradation, alteration, and loss as humans, cattle, and birds all compete for niche space in these dynamic, ribbon-like riparian landscapes. We monitored Southwestern Willow Flycatcher populations and nest success in 2000 and 2001 in a native-dominant riparian habitat site on the free-flowing Gila River in New Mexico. Six territories with nests produced 14 fledglings in 2000. In 2001, twenty territories with 14 nests produced 35 young. The total number of territories in 2001 (n = 20) was more than double the population the previous year (n = 6). The apparent increasing population trend and high nest success at this site deserve further attention in relationship to the overall population. Also because of its geographic location this population may act as an important component of the meta-population of this endangered species by linking populations in two adjacent ecoregions: the Chihuahuan and Sonoran deserts.

Southwestern Willow Flycatchers (*Empidonax traillii extimus,* hereafter SWWF) are an endangered subspecies of Neotropical migratory bird that winters in Central and South America returning north to breed in the American southwest. The reason for listing as endangered was cited as low numbers primarily resulting from habitat loss, degradation, and fragmentation (Sogge et al. 1997, USFWS 1995). This subspecies is one of four subspecies of Willow Flycatcher and they are riparian obligates that breed in patchy or dense woody riparian habitat adjacent to water (Sogge et al. 1997). The riparian habitats in the desert southwest harbor high biodiversity yet they are disproportionately small in area extending

to cover only 2% of the landscape in what Webb, Leake and Turner (2007) describe as a "Ribbon of Green". Riparian ecosystems of the southwest are dynamic and strongly influenced by both human activity and climate variability (Periman & Kelly 2000). Southwestern Willow Flycatchers depend on these ribbons of habitat throughout their range, which extends through Arizona and New Mexico, and includes southern portions of California, Nevada, Utah, and Colorado (Sogge et al. 1997).

Reduction of breeding habitat is just one of the factors that may contribute to population declines in the breeding area (Finch & Kelly 1999). Nest parasitism by Brown-headed Cowbirds (*Molothrus ater*) can have negative effects on nest success locally (Brodhead et al. 2007), but is generally not a range-wide problem (USFWS 2002). Other factors potentially contributing to Willow Flycatcher population trends include declines during migration, at stop-over sites, and while in wintering habitats. (USFWS 2002)

Protection Status.—The SWWF was listed as a species of concern by the state of New Mexico in 1988 when fewer than 200 pairs were thought to breed in the state (Unitt 1987, USFWS 1995). This prompted increasing regional monitoring coordination between New Mexico and Arizona beginning in 1993. Surveys conducted from 1993-1995 confirmed only 100 breeding pairs in New Mexico, with 75% of these occurring in the Cliff-Gila Valley (Skaggs 1996, NMpartnersinflight.org). Federal listing as an endangered subspecies occurred in 1995 (USFWS 1995). It was not until 2005 that critical habitat was designated throughout its range. The Gila Lower Box contributes to a 54.7 km section of critical habitat that extends from Grant County, New Mexico to Greenlee County in Arizona. This stretch is one of four sections in the Upper Gila Management Unit (USFWS 2005).

Habitat Associations.—Southwestern Willow Flycatchers are obligate riparian breeders but the description of specific habitat characteristics is not simple. In New Mexico, monitoring efforts have focused on two areas in the Chihuahuan Desert. The first is the middle Rio Grande where vegetation occurs in mixed native/non-native patches and large water diversion and flood control projects are prevalent. The second is the Gila River, which remains free flowing (in New Mexico) and where native vegetation is dominant. Sogge and Marshall (2000)

found that SWWF are known to use at least four different riparian habitat associations during the breeding season: Native Dominated, Exotic Dominated, and two categories of Mixed Native/Exotic: Mixed >50% Native or Mixed >50% Exotic.

Along the Gila River in New Mexico, riparian habitats contain large areas of native patches. Mixed habitats with varying proportions of natives and exotics occur on the Rio Grande. Both of these major river systems provide habitat different from other large areas of riparian habitat where saltcedar (*Tamarix* spp.) has become widespread creating exotic dominated patches.

Sogge et al. (2003) summarized monitoring efforts range-wide reporting that breeding habitats were composed of more than half willow (54%) and almost a quarter saltcedar (24%) and concluded that Southwestern Willow Flycatcher habitat was a complex mosaic of tree species (Sogge et al. 2003, Fig. 5). When they compiled data on 24 breeding sites in New Mexico, Sogge and Marshall found no breeding in exotic dominated sites but similar levels of use between native dominated (14 sites) and mixed native/exotic (10 sites) habitat types (Sogge & Marshall 2000, see table 5-1).

Nest Substrates.—More than nest tree species, twig structure seems to be a key factor in nest site selection with typically small vertical or nearly vertical branches providing the nest platform, and patchy or dense canopy providing the overstory at nest sites (Stoleson & Finch 1999, USFWS 2002). Stoleson and Finch (1999) reported nests in the Cliff-Gila Valley, New Mexico were most commonly in boxelder (*Acer negundo*) but also in Arizona sycamore (*Platanus wrightii*) and climbing rose (*Rosa multiflora*) (Stoleson & Finch 1999). In other areas, SWWF nests have commonly been recorded in willows (*Salix* spp.), saltcedar, Russian olive (*Eleangus angustifolia*), in young Fremont cottonwoods (*Populus fremontii*), alder (*Alnus* spp.), and buttonbush (*Cephalanthus occidentalis*) (Sogge et al. 1997). Researchers from Arizona report that most SWWF nests were found in exotic dominated (saltcedar) sites (Smith et al. 2002).

Status of Populations.—No range-wide data are available and varying degrees of effort make population trends of Southwestern Willow Flycatchers difficult to state (Paradzick et al. 2001, Sogge et al. 2003). Prior to listing, estimates put the total SWWF population size well below 1000 pairs, probably closer to 500 (Unitt 1987). Durst et al.

(2006) estimated the total population in 1996 as consisting of between 400–600 breeding pairs in the southwest (Durst et al. 2006). The final recovery plan issued in 2002 estimated the total population to be just under 1000 pairs (Durst et al. 2006, Fig. 1). In 2002, Sogge et al. reported that New Mexico populations accounted for approximately 30% of known territories. When considering major river drainages across states, the Gila River spanning New Mexico and Arizona supported nearly 24% of known territories (Durst et al. 2006). Increased survey effort has resulted in more thorough counts of birds over the years and some of these surveys indicate a real increase in numbers.

This research quantifies the population trend in a small, native-dominated site on the Gila River in New Mexico. Population trends of SWWF are interesting and important not only because they are an endangered species, but also because of the species' habitat specificity. As riparian obligates, these birds act as indicators of ecosystem health for riparian areas such that their presence, particularly abundance and productivity, suggests good quality habitat and ecosystem health, and their absence suggests poor ecosystem health. The results emphasize the importance of monitoring and managing patches in these ribbon habitats because of the potential contribution of small sub populations to the overall population dynamics of the species.

STUDY AREA

This research was conducted along a 14-km stretch of the Gila River in Grant and Hidalgo counties, New Mexico, in an area north of Lordsburg approximately 26 kilometers east of the Arizona state line (Fig. 1). The Bureau of Land Management (BLM) in Las Cruces manages the property, generally called the Gila Lower Box. Elevation at the site ranges from 1153 m to 1203 m, approximately 1181 m at the gauging station west of Blue Creek (NM 09432000) (Fig. 2). The area is an undeveloped floodplain with limited access and minimal primitive recreational opportunities.

This property was obtained by the BLM in 1990 with the goal of increasing the amount of riparian habitat managed by public agencies in this region. Prior to acquisition by the BLM, the property had been

heavily grazed for multiple years, woody vegetation in the area was sparse and the river had limited above ground flow (B. Merhege, pers. comm.). Management for improved riparian condition focused on the exclusion of cattle and fencing was established to accomplish this goal.

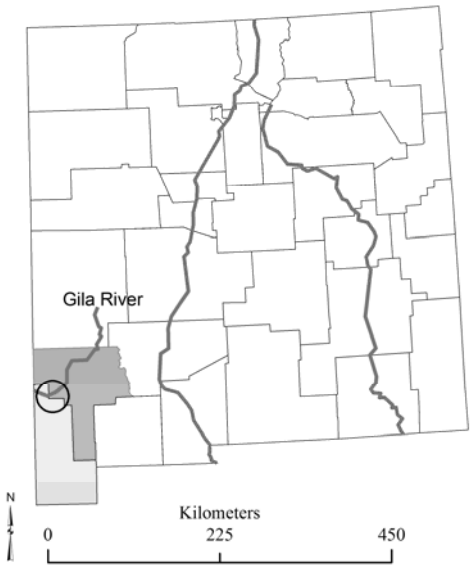

FIGURE 1. Map of New Mexico showing the location of study site in the Gila Lower Box.

The study area includes the Gila Lower Box Wildlife Habitat Area (GLBWHA), which is designated as an Area of Critical Environmental Concern (ACEC) due to the potential of this area to provide habitat for many plants and animals of concern in New Mexico. The location of this site, near the edge of the Sonoran and Chihuahuan deserts, suggests that it functions as one of the many important stepping-stones between breeding habitats for riparian obligates in these two ecoregions. The specific area surveyed begins to the east of Blue Creek pictured in Fig. 3, and extends west in the floodplain including Nichol's Canyon (Fig. 2), the Gila Lower Box, and beyond Cottonwood Canyon to a weir east of the Virden Bridge on Hwy. 70.

FIGURE 2. Photograph of Gila River floodplain in Nichol's Canyon upstream of Gauging Station (NM 09432000). Riparian vegetation occurs in strips across the floodplain.

Vegetation surveys conducted as part of an avian community study in Nichol's Canyon found a diverse mix of woody native species including Fremont cottonwood (*Populus fremontii*) Arizona sycamore (*Plantanus wrightii*), Goodding's willow (*Salix gooddingii*), black walnut (*Juglans major*), net-leaf hackberry (*Celtis reticulata*), gray oak (*Quercus grissea*), Mexican blue oak (*Quercus oblongifolia*), seepwillow (*Baccharis glutinosa*), catclaw (*Acacia gregii*) and honey mesquite (*Prosopis glandulosa*) (Campbell 2002). Exotic species in this site, specifically saltcedar and Russian olive, occur in very low proportions. This native-dominated habitat is in contrast to some of the riparian habitats where saltcedar is well established.

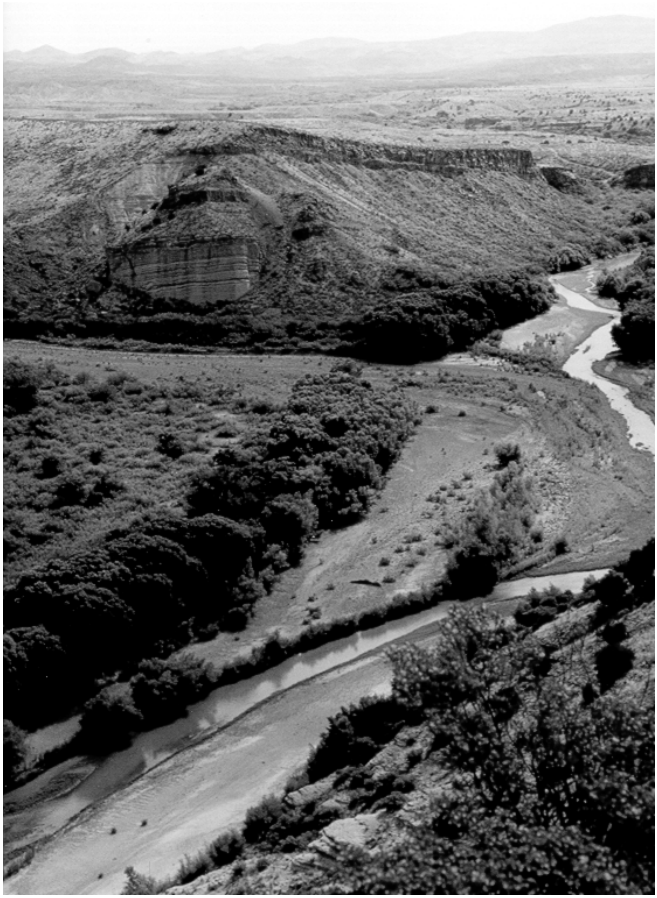

FIGURE 3. Eastern portion of the study area, which includes the confluence of Blue Creek and the Gila River, New Mexico.

METHODS

Southwestern Willow Flycatchers were surveyed using standardized and approved state survey methods coincident with the permitting process (Sogge et al. 1997). Surveys were conducted as part of the BLM Las Cruces field office's annual monitoring efforts. In 2000, surveys began 23 April and concluded 26 July. Surveys in 2001 began 23 April

and concluded 9 July. Surveys included identifying territorial males with tape-playback to elicit territorial defense response, and then using a familiarity with common Willow Flycatcher vocalizations and behavioral observations, pairs were identified. Each patch was identified on a map and a sketch of territories with locations of pairs and nests was drawn. The status of the nest was recorded at subsequent visits and the number of eggs, nestlings and fledglings were carefully recorded. A mirror-pole was employed early in the nesting cycle to establish clutch size; thereafter nests were monitored via binoculars from a distance of less than 6 m to reduce bothering nests or adults. Nest activity was noted and after hatching, the number of beaks or tails visible was recorded to estimate the number of nestlings.

RESULTS

Nests of breeding Southwestern Willow Flycatchers in the Gila Lower Box in 2001 were more than double the number estimated in this area in 2000 (Table 1). We estimated a total of 22 adult birds occupying 7 of the 10 patches surveyed in 2000 with six nests found. The estimated number of young fledged was 14. Of the six nests located in 2000, three nests occurred in coyote willow (*S. exigua*) with heights ranging from 1.8 to 4.3 m, two nests occurred in Goodding's willow at heights of 4.9 m and 2.8 m, and one was in a Fremont's cottonwood at a height of 12 m.

In 2001, we estimated a total of 42 adult birds occupying 8 of the 10 patches surveyed. We located and monitored 14 nests in four patches. All of the 14 nests found in 2001 were in Goodding's willow. Nest height ranged from 2.1 to 4.3 m (average nest height 3.0 m). All nests were in patches adjacent to surface water, primarily the Gila River. Average canopy height of the patches ranged from 7 to 17 m (average canopy height 11.8 m). Twelve nests were successful producing an estimated 35 fledglings. One nest was abandoned during construction (deemed "never a nest") and the other failed with one egg inside. Clutch sizes of the successful nests ranged from 1 to 4 eggs with an average of 2.7 eggs per nest.

TABLE 1. Results of Southwestern Willow Flycatcher surveys for the breeding seasons of 2000 and 2001 in the Gila Lower Box, New Mexico. Patches are arranged east to west.

	2000 Surveys				2001 Surveys			
Patch	**Nests**	**Adults**	**Territories**	**Fledged**	**Nests**	**Adults**	**Territories**	**Fledged**
Blue Creek	1	2	1	3	0	0	0	0
Blue Creek 2	1	6	1	2	4	10	6	7
Blue Creek 3	0	1	0	0	0	0	0	0
Nichol's 1[b]	0	0	0	0	0	1	0	0
Nichol's 2[a]	0	1	0	0	1	2	1	3
Nichol's 3[b]	0	0	0	0	0	2	1	0
Spring-Bluff 3	0	1	0	0	0	0	0	0
Snag Patch	1	3	1	2	1	3	2	3
Rattlesnake-Cliff[b]	0	0	0	0	0	2	1	0
Cottonwood Complex	3	8	3	7	8	22	9	22
Summary	6	22	6	14	14	42	20	35

[a] No documented use of this patch until 2000.
[b] No documented use of this patch until 2001.

The two areas at either end of this survey site, Cottonwood Canyon in the west and Blue Creek in the east, supported higher populations and the most nests. The Blue Creek 2 patch at the eastern most edge of the study site (Fig. 3, right side – across and upstream from Blue Creek) produced four successful nests and is an important patch to monitor as fragments of willow grow together linking Blue Creek West and Blue Creek 3 into a complex patch structure with diverse age structure and canopy heights. Blue Creek 3 demonstrates characteristics in small shredded patches and at the edges of patches where strips of willow create dense thickets but lack the patch width and mature trees that form suitable habitat. Suitability of the habitat improves for SWWF as dispersed patches coalesce over time and mature.

The Cottonwood Complex patch is the largest and contained the most nests contributing 3 nests and 7 fledglings in 2000, and 8 nests with 22 fledglings in 2001 (50% or more of the fledglings in both years). This complex formed from smaller patches, like the Blue Creek patches described above, that grew together over seasons until boundaries between them were no longer distinguishable. This demonstrates how a mosaic of patch fragments can coalesce into a complex patch with heterogeneous structure. These examples give an indication of the strong potential for more quality habitat to develop over time in these dynamic ecosystems.

Cowbirds were detected at all sites but no evidence of nest parasitism, such as proportionally larger nestlings or more developed young, was detected. This may be due to the limited use of mirror-poles in surveys. Livestock sign was present in half of the sites but no cattle were observed and the evidence suggested very low levels of grazing (one or two individuals).

DISCUSSION

This research identifies a small study area that supports a growing Southwestern Willow Flycatcher population and demonstrates a continuing increasing population trend for the site (B. Merhege, pers. comm.). Our results suggest more adult flycatchers were observed in 2001 (42 birds) than the total estimated adult population at the conclusion of the breeding season the previous year (22 birds) indicating

that new individuals, beyond those breeding previously or produced here in the previous year are using this breeding site. Surveys in both years should be considered a minimum with the possibility of some nests going undetected. The comparison between years and the conclusions drawn seem reasonable because similar levels of effort were applied.

These results suggest that low levels of breeding-site fidelity occur in this population and therefore previously unused areas of riparian habitat should be monitored each year to determine use. This is encouraging for the conservation of Southwestern Willow Flycatchers because it suggests that riparian habitat, especially small patches, throughout the breeding range of the species has the potential to support successful breeding.

As is typical of Southwestern Willow Flycatcher sites, this site demonstrated some variability in patch use between years. Some patches used in 2000 were not occupied in 2001 and some patches previously unused were occupied in 2001. The Blue Creek West patch contained a successful nest in 2000 but no SWWF were detected in that patch in 2001. This patch had an open understory in 2001 suggesting that nest trees suitable the previous year had grown beyond the lower layer or had been removed resulting in a simple, single upper canopy. In the three patches where SWWF were observed for the first time in 2001, territories were established but no pairs were detected and no nests were found (Table 1). These differences in patch occupancy may reflect differences in tree population demographics, changes in canopy structure, changes in nest substrate suitability, differences in soil saturation from year to year, or simply natural variation in a dynamic system. Future surveying efforts should include more detailed vegetation sampling and canopy density measurements to determine nest site suitability.

Differences in monitoring effort have made overall trends difficult to interpret (Sogge et al 2003). Sogge et al. (2003) report an increase in the number of known territories and breeding sites over time with 30 sites and 111 territories identified in 1993 increasing to 986 territories and 221 sites in 2003. They caution that this should not be interpreted as an increase in population of flycatchers but a function of an increase in monitoring effort over time (Sogge et al. 2003, p. 7, Fig. 1). In

contrast, this report strongly suggests an increase in population at this site because the effort in number of survey days, number of surveyors and area of the survey were held constant from 2000 to 2001. Specific focus was given to closely match the efforts between years for comparison of habitat quality and to evaluate management efforts at this site. These results do not indicate an increase in range-wide population because reductions in population at other sites are not considered.

Noted reductions in populations are important because small populations are highly prone to extinction due to the reduced genetic diversity of smaller populations compared to larger ones. Low genetic diversity restricts the species ability to adapt to changing conditions because chance events, such as disease outbreak or prolonged drought, can affect the entire population with catastrophic effects. In a study of genetics of Southwestern Willow Flycatchers sub-populations in Arizona, Busch et al. (2000) found considerable gene flow and genetic diversity suggesting that meta-population dynamics were functioning for this subspecies within and between breeding sites. This is a good sign for Southwestern Willow Flycatchers because one of the indications of a recovering or stable population include the establishment of small populations that act to increase the meta-population size which in turn leads to an increase in the genetic diversity of the population. This identifies the importance of microhabitat management on public and private lands, which can increase the number of breeding sites and help to increase genetic resilience and population stability by adding complexity to the meta-population.

Furthermore, the Gila Lower Box is in an area that lies between large breeding populations in Arizona and those in New Mexico and so may act as a stepping-stone to link breeding populations in these two major breeding areas. The importance of small sites located in close proximity to larger sites and populations is considered a strong contribution to overall population stability and is highly valued for long term conservation of this species. Thus this site has the potential to facilitate genetic mixing of populations and contributes an additional meta-population site that may improve population stability and resiliency.

The simple habitat management of this area, to fence out cattle and let vegetation recover, indicates a cost-effective and viable methodology

to improve and potentially increase available breeding habitat for SWWF. These results, though nothing new, provide an example of how land managers can improve the conservation value of their riparian lands with simple, inexpensive and efficient efforts that facilitate diverse age structure of habitat patches.

Vigilance in surveying effort, even in patches unoccupied the previous year may identify new local populations and their associated habitat patches. Further research should focus on describing habitat characteristics in used and unused patches. Periman and Kelly (2000) summarize the dynamic environmental history of SWWF habitats concluding that managing habitat for SWWF is both challenging and complex due to continually changing ecological and social pressures (Periman & Kelly 2000). As patch extent grows or shrinks do monitoring efforts adjust proportionally? All survey efforts should focus on standardizing protocol while increasing the intensity and expanding the spatial distribution of field sampling. These efforts combined with detailed habitat descriptions and improved habitat modeling will improve our knowledge of specific patch characteristics that provide high quality breeding habitat for Southwestern Willow Flycatchers.

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LITERATURE CITED

BRODHEAD, K.M., S.H. STOLESON, AND D.M. FINCH. 2007. Southwestern Willow Flycatchers (*Empidonax traillii extimus*) in a Grazed Landscape: Factors Influencing Brood Parasitism. Auk 124:1213-1228.

BUSCH, J.D., M.P. MILLER, E.H. PAXTON, M.K. SOGGE, AND P. KEIM. 2000. Genetic Variation in the endangered Southwestern Willow Flycatcher. Auk 117:586-595.

CAMPBELL, C.L. 2002. The avian community of a riparian landscape in a semi-arid region. MAG Thesis, New Mexico State University, Las Cruces.

DURST, S.L., M.K. SOGGE, H.C. ENGLISH, S.O. WILLIAMS III, B.E. KUS, AND S.J. SFERRA. 2006. Southwestern Willow Flycatcher breeding site and territory summary – 2005. USGS Southwest Biological Science Center report to the U.S. Bureau of Reclamation.

FINCH, D.M. AND J.F. KELLY. 1999. Status and migration of the Southwestern Willow Flycatcher in New Mexico. Pages 197-203 *In:* Finch, D.M., J.C. Whitney, J.F. Kelly, and S.R. Loftin 1999. Rio Grande Ecosystems: Linking Land, Water, and People. Toward a Sustainable Future for the Middle Rio Grande Basin. RMRS-P-7. Ogden UT. 245p.

NEW MEXICO PARTNERS IN FLIGHT. New Mexico Avian Conservation Partners. Online: http://nmpartnersinflight.org. Accessed 31 May 2008.

PERIMAN, R.D., AND J.F. KELLY. 2000. The dynamic environmental history of Southwestern Willow Flycatcher habitat: a survey of changing riparian conditions through time. Pp. 25-42. *In:* D.M. Finch and S.H. Stoleson (eds.) Status, Ecology, and Conservation of the Southwestern Willow Flycatcher. USDA Forest Service Gen. Tech. Report RMRS-GTR-60.

PARADZICK, C.E., T.D. MCCARTHEY, R.F. DAVIDSON, J.W. ROURKE, M.W. SUMNER, AND A.B. SMITH. 2001. Southwestern Willow Flycatcher 2000 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 175. Arizona Game and Fish Department, Phoenix, Arizona.

SKAGGS, R.W. 1996. Population size, breeding biology, and habitat of Willow Flycatchers in the Cliff-Gila Valley, New Mexico. Final Report. New Mexico Department of Game and Fish. 38pp.

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. U.S. Geological Survey, Colorado Plateau Field Station, Flagstaff, AZ.

SOGGE, M.K., AND R.M. MARSHALL. 2000. A Survey of Current Breeding Habitats. Pp. 43-56 *In:* D.M. Finch and S.H. Stoleson (eds.), Status, Ecology, and Conservation of the Southwestern Willow Flycatcher. USDA RMRS GTR-60.

SOGGE, M.K., P.DOCKENS, S.O. WILLIAMS III, B.E. KUS, AND S.J. SFERRA. 2003. Southwestern Willow Flycatcher Breeding Site and Territory Summary - 2002. USGS Southwest Biological Science Center report to the U.S. Bureau of Reclamation.

STOLESON, S.H. AND D.M. FINCH. 1999. Unusual nest sites for Southwestern Willow Flycatchers. Wilson Bulletin 111:574-575.

SMITH, A.B., C.E. PARADZICK, A.A. WOODWARD, P.E.T. DOCKENS, AND T.D. MCCARTHEY. 2002. Southwestern Willow Flycatcher 2001 survey and nest monitoring report. Nongame and Endangered Wildlife Program Technical Report 191. Arizona Game and Fish Department, Phoenix, AZ.

UNITT, P. 1987. *Empidonax traillii extimus:* an endangered subspecies. Western Birds 18:137-162.

U.S. FISH AND WILDLIFE SERVICE (USFWS). 1993. Endangered and threatened wildlife and plants: Proposed rule to list the Southwestern Willow Flycatcher as endangered with critical habitat. Department of the Interior. Federal Register. 58(140): 39495-39522.

U.S. FISH AND WILDLIFE SERVICE. 1995. Endangered and threatened wildlife and plants: Final rule determining endangered status of the Southwestern Willow Flycatcher. Federal Register 60(38): 10694-10715.

U.S. FISH AND WILDLIFE SERVICE. 1997. Endangered and threatened wildlife and plants: Final determination of critical habitat for the Southwestern Willow Flycatcher. Federal Register. 62(140): 39129-39147.

U.S. FISH AND WILDLIFE SERVICE. 2002. Southwestern Willow Flycatcher Recovery Plan. Albuquerque, NM. i-ix + 210 pp., Appendices A-O.

U.S. FISH AND WILDLIFE SERVICE. 2005. Endangered and threatened wildlife and plants: Designation of critical habitat for the Southwestern Willow Flycatcher. Federal Register 70(201): 60886-61003.

WEBB, R.H., STANLEY A. LEAKE, AND R.M. TURNER. 2007. The Ribbon of Green: Change in Riparian Vegetation in the Southwestern United States. University of Arizona Press, Tucson. 463 pp.

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FLUCTUATIONS IN NESTING WATERBIRD POPULATIONS IN NEW MEXICO'S RIO GRANDE VALLEY: 1975-2007

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Abstract.—Aerial surveys and ground counts of colonially nesting waterbirds were conducted on the Middle and Lower Rio Grande during the 2007 breeding season. Of eight nesting species historically documented, greater numbers of nests were counted in the Lower Rio Grande for only Great Egret (*Ardea alba*) during 2007 as compared to intermittent surveys conducted since 1973. Comparable numbers of nests were recorded for Neotropic Cormorant (*Phalacrocorax brasilianus*) and Great Blue Heron (*Ardea herodias*), while Double-crested Cormorant (*Phalacrocorax auritus*), Snowy Egret (*Egretta thula*), and Black-crowned Night-Heron (*Nycticorax nycticorax*) all showed declines in nest numbers of as much as 90%. Little Blue Heron (*Egretta caerulea*) and Cattle Egret (*Bubulcus ibis*), which were previously recorded in at least one year, were not found nesting in 2007, though Cattle Egrets were found to be nesting in the Middle Rio Grande. More regular and systematic population monitoring of colonial waterbirds along the Rio Grande and throughout New Mexico should be undertaken due to the dramatic declines documented in 2007. Intensively-managed Caballo Reservoir has the potential to be maintained at levels conducive to large nesting colonies during the breeding season, but only if it can be done without impacting the ability of downstream irrigators to access water when needed during that time period.

Colonial waterbirds are typically piscivorous and must be able to access open water with prey to forage. These species evolved the system of colonial nesting wherein territoriality was minimized in order to allow many to benefit from extensive food resources packed into limited area. Nesting aggregations are often multi-species in composition (Frederick et al. 1995); in New Mexico's Rio Grande Valley eight species, Double-crested and Neotropic cormorants, Great Blue and Little Blue herons, Great, Snowy, and Cattle egrets, and Black-crowned Night-Herons (see Table 1 for scientific names), have historically nested in trees in mixed colonies (Hundertmark 1975, 1979).

TABLE 1. Primary foods and documented foraging distances, according to Birds of North America accounts[a], of colonial waterbird species found in the Lower and Middle Rio Grande Valley, New Mexico, 1975-2007.

			Foraging distance	
Common name	**Scientific name**	**Primary food**	**Mean**	**Max.**
Neotropic Cormorant	*Phalacrocorax brasilianus*	fish < 24 cm	2	not given
Double-crested Cormorant	*P. auritus*	fish < 40 cm	3	40
Great Blue Heron	*Ardea herodias*	vertebrates	< 3	30
Great Egret	*A. alba*	fish < 30 cm	< 10	40
Snowy Egret	*Egretta thula*	variety < 3 cm	3	not given
Little Blue Heron	*E. caerulea*	NA	NA	NA
Cattle Egret	*Bubulcus ibis*	variety < 3 cm	Less	30
Black-crowned Night-Heron	*Nycticorax nycticorax*	variety	not given	not given

[a] Butler 1992, Davis 1993, Hatch and Weseloh 1999, Parsons and Master 2000, McCrimmon et al. 2001, Smith, 1995, Telfair 1994, Telfair and Morrison 1995.

Hundertmark's work (1974, 1975, 1979), mostly from boats, shore, or wading, provided a baseline of nesting populations for Elephant Butte Reservoir, potentially the largest foraging site in the Lower Rio Grande Valley. Coordinated air and boat surveys in 1985 (C.G. Schmitt, New Mexico Department of Game and Fish, unpublished data) and aerial surveys in 1998 (NMOS 2007) and 1999 (S.O. Williams III, New Mexico Department of Game and Fish, unpublished data) were the only documented efforts to monitor waterbird breeding in subsequent years. This current survey, an initial aerial search with ground follow-up observations, provided the first systematic counts of nesting colonial waterbirds in this region in the 21st century.

STUDY AREA

The Rio Grande extends approximately 320 km from below Albuquerque to the Texas border. It passes through two National Wildlife Refuges (NWRs), four state waterfowl management areas, four state parks, and large expanses of private and other public (Middle Rio Grande Conservancy District and Bureau of Reclamation) lands. It is impounded by two mainstem reservoirs (Elephant Butte and Caballo). Man-made impoundments occur intermittently in the floodplain, while some on the wildlife refuges and management areas were created intentionally and managed for wildlife. Others were accidentally created by railroad and low-flow channel embankments. For the purposes of this report, the study area was split into the Middle Rio Grande (from Albuquerque to Bosque del Apache NWR), and the Lower Rio Grande (from below Bosque del Apache to the lower end of Caballo Reservoir).

Elephant Butte Dam was completed in 1916 and Caballo Dam was completed in 1940. At peak storage Elephant Butte Reservoir extended 65 km upstream of the dam, creating a large shallow upper lake above 'the Narrows' lined with inundated trees and shrubs ideal for nesting waterbirds. The lake was within 2 m from being full each breeding season between 1985 and 1998. A long-term drought began in 1999 and the lake receded below the Narrows in 2002. The upper lake, with its marshy, swampy margins, remained dry through 2007. Caballo Reservoir when full reaches to within 5 km of Elephant Butte Dam. Though its capacity is <10% of Elephant Butte's 2.3 million acre-feet, it was built to

hold water released from Elephant Butte Reservoir for power generation during the winter for later downstream irrigation use. Thus it can fluctuate greatly, often dropping more than 5 m during a breeding season.

Riparian gallery forests (bosque) of cottonwoods (*Populus deltoides* var. *wislizeni*), with an understory of exotic Russian olive (*Elaeagnus angustifolia*) and tamarisk (*Tamarix* sp.), were the predominant floodplain vegetation in much of the upper half of the survey area. This bosque occasionally reached as much as half a mile from the river channel; it was much more limited south of Caballo Reservoir. Potential nest sites within the reservoirs were inundated trees (both dead and alive) and shrubs of cottonwood, Russian-olive, and tamarisk as well as stands of willow (*Salix* sp.).

METHODS

I conducted a review of published and unpublished literature containing previous observations and survey results for colonial waterbirds within the study area. I tabulated estimated numbers of nesting colonial waterbirds by year and by species from journal articles, reports, and New Mexico Department of Game and Fish (NMDGF) files. Numbers of nests from previous years were used as comparisons for the 2007 aerial survey.

A low-altitude aerial survey was conducted 13 May 2007 with two observers in a Cessna 206 fixed-wing aircraft. Survey methods generally followed those described in the North American Colonial Waterbird Monitoring Manual (Steinkamp et al. 2003), with the exception of flight speeds (~ 150 km/hr), which were limited by the capabilities of the aircraft. Overall, the aerial survey technique did not allow a) time for accurate nest counts, b) sufficiently clear, stable and close views to distinguish similar species, c) the ability to see dark-colored species as effectively as light-colored species, and d) the ability to see nests in colonies in live trees (Frederick et al. 1995, Rodgers et al. 2005). Nonetheless, the survey methods was used to quickly and efficiently locate rookeries for follow-up ground checks. The area within 400 m to the west of the river was surveyed on the southbound flight and then the same area to the east of the river was surveyed on the northbound

fight. Side trips to check potential rookery sites farther from the channel were made as needed. Coordinates of located colonies were recorded with global positioning system (GPS) units and archived with New Mexico Department of Game and Fish in Santa Fe.

Each colony detected aerially was revisited and ground checked on 20-21 May and 12-13 June 2007 and monitored through a 15-60X spotting scope from as high as possible on adjacent slopes. Nesting species were identified and counts of active nests by species were recorded.

RESULTS

Aerial surveys identified heron and/or cormorant nesting colonies in five distinct locations; all but one small rookery of two Great Blue Heron nests were previously known.

Middle Rio Grande.—A mixed colony of Cattle Egrets, Snowy Egrets, and Black-crowned Night-Herons on Sevilleta NWR near the San Acacia Diversion Dam, Socorro County, was observed from the air on 13 May 2007 and on a subsequent ground visit on 12 June 2007. This rookery was previously reported as containing as many as 300 nests in recent (circa 2005; R.L. Robischaud, *in litt.*). The rookery is on the east bank, under the cottonwood canopy 10-50 m back from the edge of the river. On 12 June, approximately 35 nests were seen from 200 m away on the west bank. About two thirds were identified as Cattle Egret nests, and the remaining one-third were likely Snowy Egret nests. Black-crowned Night-Herons were seen entering the rookery as well.

Lower Rio Grande.—Four rookeries were found on this river segment. It was also the area that was monitored in previous years. Six of eight historically recorded species were documented in this area in 2007 (Table 2), and trends for each species are summarized below.

Neotropic Cormorant.—Neotropic Cormorants were first documented nesting in New Mexico at Elephant Butte Reservoir in 1972 (Hundertmark 1974) and at least six pairs nested in the upper lake in 1975 (Hundertmark 1975). Nesting apparently had only been confirmed once, in 1994 at Bosque del Apache NWR, since 1979 (NMOS 1993). However, Neotropic Cormorants have been seen in

New Mexico annually by birdwatchers, especially in the 1980s and 1990s at Elephant Butte and Caballo reservoirs, and at Bosque del Apache NWR, with as many as 750 reported at one time (NMOS 1989). The total of five nests documented in 2007, four in Quates Marsh and one in Elephant Butte Reservoir, was comparable to total of six documented in 1975 (Table 2).

TABLE 2. Documented nests, based on counts or the minimum estimate, of eight colonial waterbird species between San Marcial and Caballo Dam, New Mexico which were surveyed intermittently from 1975 to 2007.

Species	1975	1979	1985	1998	1999	2007
Neotropic Cormorant	6	1	-	-	-	5
Double-crested Cormorant	260	280	-	-	-	38
Cormorant sp.	-	-	350	206	146	-
Great Blue Heron	-	-	-	-	57	22
Great Egret	5	3	-	-	10	38
Snowy Egret	200	91	-	-	198	1
Little Blue Heron	2	-	-	-	-	0
Cattle Egret	3	1	-	-	-	0
Black-crowned Night-Heron	300	250	-	-	-	17

Double-crested Cormorant.—Double-crested Cormorants were first documented in New Mexico in 1913 (Huntertmark 1975). In 1937, 200 birds were reported nesting in the Lower Rio Grande Valley (Hundertmark 1975). Between 1975 and 2007 the number of cormorant nests likely peaked in 1996, at an estimated 600 pairs (Wires et al. 2001), but declined steadily during the subsequent decade (Table 2, Fig. 1). The 2007 count of 38 active nests in the Lower Rio Grande Valley was only about 5-10% of the minimum count of 350 in 1985 and the 1996 estimate.

Cormorant colony locations varied greatly year-to-year, depending on where suitable overwater nest sites were available. In the 1970s, nest

sites were abundant on Elephant Butte Marsh (1973-75) and Caballo Lake (1979; Hundertmark 1975, 1979). . However, in 1999, as Elephant Butte Reservoir began to decline, about 100 cormorant nests were at Quates Marsh near San Marcial, 46 were below Elephant Butte Dam on Caballo or Mims Lakes and none were seen on Elephant Butte Reservoir (S.O. Williams III, unpublished data). Of the 38 nests counted in 2007, 8 were on Caballo, 19 were on Elephant Butte, and 11 were at Quates.

Great Blue Heron.—Great Blue Herons were not recorded nesting anywhere in the Lower Rio Grande Valley in the 1970s (Hundertmark 1975, 1979). Williams (unpublished data) recorded 57 nests in 1999, including 38 in Las Animas Creek west of Caballo Lake. In 2007, 20 nests were found at Quates Marsh and two more 6 km east. Las Animas Creek was not surveyed in 2007.

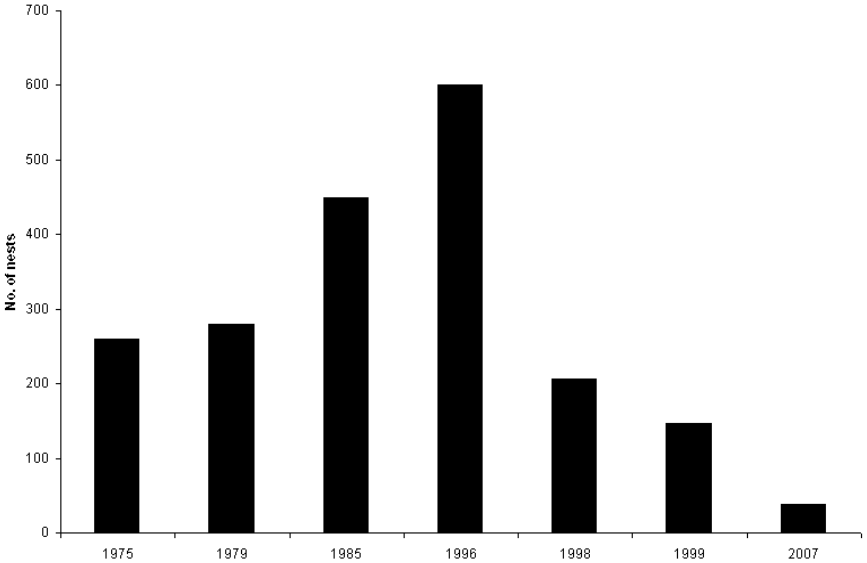

FIGURE 1. Counts or estimates of cormorant nests in the Lower Rio Grande Valley, New Mexico, 1975-2007. Often it was not possible to determine if Neotropic Cormorants were present in Double-crested Cormorant colonies, though the latter were likely more abundant.

Great Egret.—Hundertmark (1975) found Great Egrets to be uncommon, with only 5 nests located in 1975 and 3 in 1979. Williams (unpublished data) estimated that only 5% of 200 white egret nests at Quates Marsh in 1999 were of this species, yet the estimate of 10 was double the 1970s count totals. In a ground count on 13 June 2007, virtually all of the ≥35 white egret nests located were of Great Egrets, a 3.5-fold increase over the 1999 estimate.

Snowy Egret.—Snowy Egrets were prolific breeders in the Lower Rio Grande Valley, with several hundred nests reported in 1975 and 1999 (Table 2). In 2007, no active nests were confirmed in Quates Marsh on 13 June, the only area where white egrets were seen during aerial surveys. Snowy Egrets were in the area and might have attempted nesting, but not in the nearly the numbers reported in earlier decades.

Little Blue Heron and Cattle Egret.—Neither of these species was found nesting in the Lower Rio Grande Valley in significant numbers in the past (Table 2). Neither species was observed during the limited survey time available in 2007.

Black-crowned Night-Heron.—This species was an abundant nester in Elephant Butte Marsh in the 1970s. Night-heron nests are often low and in leafy vegetation, so they are difficult to find from the air (Steinkamp et al. 2003). Therefore, even though they were not documented during aerial surveys between 1985-1999 (Table 2), this does not prove they were absent. While they were also not observed during the 2007 aerial survey, 17 occupied nests were counted in Quates Marsh on 13 June 2007; only ~ 5% of the 1970s estimates of 250-300 nests (Hundertmark 1975, 1979).

DISCUSSION

Lower Rio Grande Valley.—Thirty-three breeding seasons have elapsed since Hundertmark (1975) waded into Elephant Butte Marsh in 1975 to survey nesting colonial waterbirds. In a third of a century, we have data from only six of those breeding seasons, and half of those were one-day aerial surveys; "snapshots" rather than "movies" of an entire breeding effort for a year, much less for 33 years. All of these breeding season data were obtained using the same general approach of locating colonial waterbird rookeries and counting numbers of each

species of waterbirds at these rookery areas. However, counts of breeding waterbirds varied by survey method (i.e., aerial, ground, or boat), time of year, survey extent, and type of data collected (e.g., number of individual adults vs. productivity of nests). Thus, while trends for some species are relatively clear and undeniable, there is much more that we do not know than what we do know.

By 2007, Elephant Butte Reservoir had been in existence for 91 years and Caballo Reservoir for 66 years. Elephant Butte was filled completely for the first time in 1942, was very low during the drought of the 1950s, was again full in the 1980s and 1990s, and finally fell again in the last decade. Within these major water level changes were many annual and seasonal fluctuations. Changes in Caballo's water levels have been more uniform and annual in nature. Throughout the lives of both reservoirs, the availability of inundated trees and shrubs for nest sites has likely varied, dependent upon opportunities for growth in intervening low water levels and the hardiness of snags to remain standing despite rot, wind and wave action. Although presence and size of nesting colonies of waterbirds is dependent on the availability of suitable nest sites, data on the availability of nest sites were not previously collected. How this important factor varied over time cannot now be indirectly measured. However, one thing is certain: no matter what the condition of nest sites in Upper Elephant Butte between1914 and 2001, once that portion of the lake was dry, there were no suitable colony sites between the Narrows and Quates Marsh (30 km).

All locally nesting species, except Cattle Egret, forage predominately in water. While the other egrets and herons take a variety of prey, Great Egrets, Neotropic Cormorants, and Double-crested Cormorants eat mostly fish (Table 1). All three species are likely to forage within 0-10 km of the rookery, with a maximum foraging range of 40 km (Table 1). In 1999, when there were 100 cormorant nests at Quates Marsh (Table 2; S.O. Williams III, unpublished data), there was still water in upper Elephant Butte Reservoir, about 15 km downstream of Quates Marsh. In 2007, when only 11 Double-crested and 4 Neotropic Cormorant nests were identified at Quates Marsh, the open water of Elephant Butte Reservoir was 30 km away. For cormorants to nest at Quates in 2007 and forage on the lake would have required all flights to be at their maximum foraging range. Meanwhile, no inundated nest sites remained

in the reservoir above the Narrows. Therefore it is likely that the 85-90% decline in nesting Double-crested Cormorants by 2007 from the estimated peak of 600 nests in 1996 was mostly attributable to decreased availability of suitable nesting sites within an acceptable distance of the lakes. While both species of cormorant do forage in the river and low-flow conveyance channel, these foraging areas clearly do not support the large populations that the reservoir did in the past. The amount of water in Elephant Butte and Caballo reservoirs and any effect that might have had on the availability of prey does not appear to have limited cormorant nesting.

Documented nests of Neotropic Cormorants were comparable in 1975 and 2007. Since winter reports of 30-100, and even 750 (NMOS 1982) Neotropic Cormorants were regular in the 1980s and 1990s, it seems likely that in the high water years there were more, perhaps many more, nesting. Unfortunately the dearth of breeding records for the same period does not allow an assessment of their breeding population trend, only the conclusion that breeding Neotropic Cormorants are no worse off in 2007 than they were as recent pioneers in 1975.

While cormorant nests (assumed to be mostly Double-crested) declined approximately10-fold through the last decade, Great Egret nests increased about10-fold since the late 1970s. This suggests that Great Egrets were still able to forage more successfully in Quates Marsh and along the Rio Grande than were Double-crested Cormorants. Great Blue Herons, while not recorded in the 1970s, appeared to remain stable since 1999, with more than 22 nests recorded in 2007 in the same river and reservoir stretch that 19 were recorded in 1999.

Finally, two species with more varied diets, Snowy Egrets and Black-crowned Night-Herons, nested in much lower numbers in 2007 than in all previous decades. While cormorant nests are almost always quite visible, these two species can nest low within live vegetation and can be missed during aerial surveys. Thus, declines observed in these two species are not as certain as those detected in the Double-crested Cormorant.

Middle Rio Grande Valley.—Only the one large egret/night-heron colony (on Sevilleta NWR) was encountered between Albuquerque and Bosque del Apache NWR in 2007. In 1982 60 Snowy Egret and 40 Black-crowned Night-Heron nests were counted at a rookery near

Belen. Cattle Egrets were reported with 3-4 nests at the same rookery in 1973 and 1984, and a Little Blue Heron nest was there in 1984 (NMOS 1984). No rookery was found in that area during the 2007 aerial survey; it was apparently abandoned by the mid-1980s due to disturbance (W. H. Howe, unpublished data). Intermittently Black-crowned Heron and Snowy Egret colonies have been reported in residential areas of Bernalillo and Valencia counties. USDA Wildlife Service responds to reports regarding the presence of those colonies in residential areas, and likely discourages further nesting (W.H. Howe, pers. comm.).

RECOMMENDATIONS

The documented ninety percent decline in nest numbers of Double-crested Cormorant, Snowy Egrets, and Black-crowned Night-Herons in the Lower Rio Grande Valley is of management concern. More regular and systematic population monitoring of colonial waterbirds along the Rio Grande and throughout New Mexico should be undertaken. More systematic, season-long, ground monitoring would also provide further insight into reproductive success than that provided by the single annual observations (1985, 1998, 1999) or even the 3-visit (2007) scenarios of the past two decades.

Elephant Butte Reservoir will take years to refill and then only with above average precipitation. The pool of Caballo Reservoir, however, is smaller and intensively managed. Yet, when conditions were right (1979, 1998), large numbers of cormorants nested there. If natural resource managers decide that maintaining or increasing colonial waterbird breeding populations is a priority, they could determine from historic records and current conditions a level for Caballo Lake that provides ample nesting sites in standing water. Managers and biologists from New Mexico Department of Game and Fish, U. S. Fish and Wildlife Service, the Bureau of Reclamation, the New Mexico Interstate Stream Commission, and the Elephant Butte Irrigation District could explore means of maintaining those nest sites in standing water from 1 April to 1 August each year

ACKNOWLEDGMENTS

S.O. Williams III identified the need for an extensive survey of the Middle and Lower Rio Grande for colonial waterbirds and placed it among priorities for Share with Wildlife funding. The NMDGF Share with Wildlife review committee selected this study for funding. C.L. Hayes and M. Medina, NMDGF, processed the contract and grant for the federal State Wildlife Grants contribution to this project. W.H. Howe and R.L. Robichaud, U. S. Fish and Wildlife Service, and R.H. Doster, U. S. Bureau of Reclamation, provided waypoints of known rookeries prior to the aerial surveys. D.G. Mikesic assisted on the aerial survey, piloted safely by L. Rhodes, Gallup Flying Service. C.L. Hayes and R.H. Doster aided on ground surveys. Finally, C.A. Hundertmark, W.H. Howe, C.G. Schmitt, and S.O. Williams III conducted previous nest counts within the survey area between 1970 and 2000. Without these important data, population trends would not be discernible. C.L. Hayes and H.A. Walker reviewed the draft of the report to NMDGF, resulting in a much improved document.

LITERATURE CITED

BUTLER, R.W. 1992. Great Blue Heron (*Ardea herodias*). *In*: A. Poole and F. Gill, eds. The Birds of North America, No. 25. The Birds of North America, Inc., Philadelphia, PA.

DAVIS, W.E. JR. 1993. Black-crowned Night-Heron (*Nycticorax nycticorax*). *In*: A. Poole and F. Gill, eds. The Birds of North America, No. 74. The Birds of North America, Inc., Philadelphia, PA.

DUERR, A.E., T.M. DONOVAN, AND D.E. CAPEN. 2007. Management-induced reproductive failure and breeding dispersal of Double-crested Cormorants on Lake Champlain. Journal of Wildlife Management 71:2565-2574.

FREDERICK, P.C., T. TOWELES, R.J. SAWICKI, AND G.T. BANCROFT. 1995. Comparison of aerial and ground techniques for discovery and census of wading bird (Ciconiiformes) nesting colonies. Condor 98:837-841.

HATCH, J.J., AND D.V. WESELOH. 1999. Double-crested Cormorant (*Phalacrocax auritus*). *In* A. Poole and F. Gill, eds. The Birds of North America, No. 441. The Birds of North America, Inc., Philadelphia, PA.

HUBBARD, J.P. 1978. Revised Checklist of New Mexico Birds. New Mexico Ornithological Society Publication No. 6.

HUNDERTMARK, C.A. 1974. First record of Olivaceous Cormorant nesting in New Mexico. Wilson Bulletin 86:65.

HUNDERTMARK, C.A. 1975. Breeding birds of Elephant Butte Marsh, 1975 survey report. New Mexico Department of Game and Fish, Santa Fe.

HUNDERTMARK, C.A. 1979. Census of breeding colonial waterbirds: Elephant Butte and Caballo Reservoirs, New Mexico, 1979. New Mexico Department of Game and Fish, Santa Fe.

MCCRIMMON, D.A. JR., J.C. OGDEN, AND G.T. BANCROFT. 2001. Great Egret (*Ardea alba*). *In*: A. Poole and F. Gill, eds. The Birds of North America, No. 570. The Birds of North America, Inc., Philadelphia, PA.

NEW MEXICO ORNITHOLOGICAL SOCIETY (NMOS). 1984. June 1 – July 31, 1984. New Mexico Ornithological Society Field Notes 23(3):27.

NEW MEXICO ORNITHOLOGICAL SOCIETY. 1989. December 1, 1988 – February 28, 1989. New Mexico Ornithological Society Field Notes 28(1):5.

NEW MEXICO ORNITHOLOGICAL SOCIETY. 1994. June 1 – July 31, 1994. New Mexico Ornithological Society Field Notes 33(3):40.

PARSONS, K.C., AND T.L. MASTER. 2000. Snowy Egret (*Egretta thula*). *In*: A. Poole and F. Gill, eds. The Birds of North America, No. 489. The Birds of North America, Inc., Philadelphia, PA.

RODGERS, J.A., JR., P. S. KUBILIS, AND S.A. NESBITT. 2005. Accuracy of aerial surveys of waterbird colonies. Waterbirds: 28:230-237.

SCHMITT, C.G. 1985. Cormorant Survey 1985, Elephant Butte and Caballo lakes area. New Mexico Department of Game and Fish, Santa Fe.

SMITH, J.P. 1995. Foraging flights and habitat use of nesting wading birds (Ciconiiformes) at Lake Okeechobee, Florida. Colonial Waterbirds 18:139-158.

STEINKAMP, M., B. PETERJOHN, V. BIRD, H. CARTER, AND R. LOWE. 2003. Breeding season survey techniques for seabirds and colonial waterbirds throughout North America. Patuxent Wildlife Research Center, U.S. Geological Survey, Laurel, MD.

TELFAIR , R.C. II. 1994. Cattle Egret (*Bubulcus ibis*). *In*: A. Poole and F. Gill, eds. The Birds of North America, No. 113. The Birds of North America, Inc., Philadelphia, PA.

TELFAIR, R.C. II, AND M.L. MORRISON. 1995. Neotropic Cormorant (*Phalacrocorax brasilianus*). *In*: A. Poole and F. Gill, eds. The Birds of North America, No. 137. The Birds of North America, Inc., Philadelphia, PA.

WIRES, L.R., F.J. CUTHBERT, D.R. TREXEL AND A.R. JOSHI. 2001. Status of the Double-crested Cormorant (*Phalacrocorax auritus*) in North America. Final Report to U. S. Fish and Wildlife Service, Washington, D.C.

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ABSTRACTS FROM THE NMOS 47TH ANNUAL MEETING

The following abstracts are from the papers presented Saturday, 25 April 2009 at the 47th Annual Meeting of the New Mexico Ornithological Society held at Fuller Lodge in Los Alamos, New Mexico. Abstracts are listed in order of the presentations.

ORAL PRESENTATIONS

CAN WILDLIFE TRANSPLANTS REALLY CURE CANCER?

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Transplants have become an increasingly ubiquitous management tool to reverse declines of imperiled wildlife species. As such, they often are

considered a panacea for all things wrong in the natural world. The truth is that most transplanted populations do not become self-sustaining, but either fail in the first few generations or need regular management intervention. The main reason for this is that little forethought is given to quality of the habitat in which organisms are placed and factors that affect that quality. Recovery efforts for the imperiled Lesser Prairie-Chicken (*Tympanuchus pallidicinctus*) will undoubtedly include transplants possibly even to southeastern New Mexico, an area dominated by oil and gas development. Given the impact of this type of development, an in-depth investigation is essential to determine if there is a reasonable probability of success. In this paper, I explain how I am applying niche and competition theory and techniques of Landscape Ecology to determine (1) how well the natural environment of southeastern New Mexico can support prairie-chickens and (2) if a balance exists that will allow predictable availability of oil and gas reserves and enough habitat to maintain a viable metapopulation of prairie-chickens. The framework I present will be useful for recovery of any wildlife species, but will be unable to elevate transplanting wildlife to the level of curing all of nature's ills.

THE EFFECTS OF FIRE ON AVIAN ABUNDANCE AND DIVERSITY IN AN ARIZONA OAK SAVANNA

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Following the 2002 occurrence of the 37,000 ha Ryan Fire in southeastern Arizona, we established sixteen (eight each in burned and unburned habitat) 4-ha plots to study the impact of fire on an oak-savanna avian community. Plots were sampled for grassland height and cover, tree cover, and avian abundance and diversity. By 2008, the herbaceous vegetation was taller on burned plots (33.34 cm) than unburned plots (29.3 cm), and the tree canopy cover was less on burned plots (8%) than unburned plots (12.5%). In 2003, there was a drastic difference in average herbaceous vegetation cover between burned (8%) and unburned plots (77%), but that difference was gone by 2008 (burned 81% and unburned 82%). In 2003, 2004, and 2008 burned plots had an average avian species richness of 17.6, 17.6, and 14, while the unburned plots averaged 18.3, 18.7, and 16.5, respectively. Burned plots had an average bird abundance per count of 15.22, 11.35, and 14.81 over the three sampling periods, whereas unburned plots had an average of 16.5, 16.95, and 16.97 for the same years. Also, three types of species responses to the fire were observed; no response (n = 2), positive response (n = 8), and negative response (n = 5). Overall, the

Ryan Fire has apparently resulted in a long-term decrease in percent tree canopy cover, and short-term negative effects on the herbaceous vegetation. For the avian community, the Ryan Fire altered species composition, but had little effect on richness and abundance.

BREEDING BIRDS OF ANIMAS AND BERG PARKS, FARMINGTON, NEW MEXICO

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Photographs taken by the author of the species of birds known to breed or suspected of breeding in contiguous Animas and Berg parks in Farmington, NM will be shown. The breeding birds in this riparian woodlands along the Animas River and irrigation ditches at about 5350 feet elevation are: Green Heron, Canada Goose, Mallard, Common Merganser, Sharp-shinned Hawk, Cooper's Hawk, Ring-necked Pheasant, Mourning Dove, Great Horned Owl, Western Screech-Owl, Black-chinned Hummingbird, Broad-tailed Hummingbird, Belted Kingfisher, Downy Woodpecker, Northern (Red-shafted) Flicker, Western Wood-Pewee, Ash-throated Flycatcher, Western Kingbird, Black-billed Magpie (American Magpie), Northern Rough-winged Swallow, Barn Swallow, Black-capped Chickadee, White-breasted Nuthatch, House Wren, Bewick's Wren, American Robin, European Starling, Cedar Waxwing, Yellow Warbler, MacGillivray's Warbler, Yellow-breasted Chat, Spotted Towhee, Song Sparrow, Black-headed Grosbeak, Blue Grosbeak, Indigo Bunting, Lazuli Bunting, Indigo × Lazuli Bunting hybrid, Common Grackle, Brown-headed Cowbird, Bullock's Oriole, House Finch, Lesser Goldfinch, and House Sparrow. All these species spend the summer here, a number have been seen carrying food, nests of many species have been found, quiet a few have been observed feeding nestlings, some have been seen tending fledglings, and fledglings of various species have been observed. The list is based on my frequent observations during the summers of 2006 and 2007, as well as the careful and thorough records kept by Donna Thatcher, Director of the Riverside Nature Center. Many other birders accompanied me on weekly walks through the park and contributed to the list. Many park visitors also report nests to the Nature Center staff.

FALCONS AS NEIGHBORS: 13 YEARS OF OBSERVATIONS OF NESTING AMERICAN KESTRELS IN ELDORADO AT SANTA FE, NEW MEXICO

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American Kestrels (*Falco sparverius*) began to nest in the nest boxes I provided on my 0.7 ha lot when I moved to Eldorado at Santa Fe (actually 15 km south of the famous plaza) in 1995. They nested 11 of 13 years in the "yard" territory, and 9 of 11 years in a nearby greenbelt. All 20 known nesting attempts were successful; 62 young banded from 18 nest attempts were equally split between males and females. Only three unhatched eggs were found during banding, so that hatching rate was likely higher than 90%. The mean number of young fledged between 1995 and 2001 (5.0 fledglings/attempt, n = 9) was significantly higher than between 2004 and 2008 (3.9 fledglings/attempt, n = 8). Adult kestrels were tolerant of general human activity in the neighborhood. In 1995 the "yard" female clearly recognized me after I banded the young, and subsequently circled and called whenever I was outside. Other neighborhood humans were ignored. In 1997, the initial "yard" female, captured and banded in early March, subsequently nested in the Greenbelt territory with her banded mate while an unbanded pair occupied the "yard" territory. Thereafter nestling banding involved my leaving home and returning in disguise. In 2006 and 2007 adults that had dived repeatedly on me during banding did not recognize me without disguise later the same day. These and other anecdotal observations suggest to me that breeding American Kestrels are sensitive to handling and visits to nest boxes. Yet grabbing incubating females from nest boxes remains the standard means of capturing them for banding during demographic and nest site fidelity studies.

WINTER SITE FIDELITY OF THE THREE ROSY-FINCH SPECIES FOUND IN THE SANDIA MOUNTAINS OF CENTRAL NEW MEXICO

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Black Rosy-Finches (*Leucosticte atrata*), Gray-crowned Rosy-Finches (*L. tephrocotis*), and Brown-capped Rosy-Finches (*L. australis*) migrate south in

winter to high elevation areas, generally staying above 7000 feet. The Sandia Crest in Bernalillo Co., New Mexico hosts these three species of rosy-finches. The Sandia Mountains has been considered the southern limit of their range. For the past six winters, from 2004 to 2009, we have been live trapping and banding rosy-finches in order to study their site fidelity. We have documented the first known winter site fidelity for all three species of rosy-finches, and have documented that many site devoted birds exhibit over-winter site fidelity by recapturing the same individuals during the same season. (In dedication to Ryan D. Beaulieu.)

THE PREPARATION OF A SCIENTIFIC BIRD SPECIMEN: WHAT HAPPENS TO THE DEAD BIRDS I DONATE TO THE MUSEUM?

ANDREW B. JOHNSON, C. JONATHAN SCHMITT, and CHRISTOPHER C. WITT, Museum of Southwestern Biology, Division of Birds, Department of Biology, University of New Mexico, Albuquerque, NM 87131

Each year the Museum of Southwestern Biology Division of Birds receives hundreds of bird specimens from a variety of sources, including birds salvaged by NMOS members and other citizens with a naturalist's eye and a loathing for waste of a good specimen. This presentation will attempt to answer the question we often receive from the donors of such specimens: "What do you do with these things?" During the course of this presentation, we will convert real bird carcasses into museum specimens complete with labels and frozen tissue samples. We will also cover some of the uses of museum specimens, and the role that specimens still play in understanding biodiversity, biogeography, and a host of other biological questions.

A HISTORICAL LOOK AT POPULATIONS OF SOUTHWESTERN WILLOW FLYCATCHERS FOUND ALONG THE GILA RIVER IN SOUTHWESTERN NEW MEXICO

ROLAND SHOOK, Western New Mexico University, Silver City, NM 88062

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*) is a subspecies of one of ten North American members of the genus Empidonax. Evidence of declining populations in the West, and associated declines in their favored riparian habitat, led to the Southwestern Willow Flycatcher being listed as a Federally Endangered species by the U.S. Fish and Wildlife Service in

1995. Records of Willow Flycatchers have been verified in New Mexico since 1886, but it was not until 1959 that breeding was confirmed along the Gila River near Redrock, and since then, this species has been shown to be a regular summer breeder in the Redrock and Cliff/Gila areas. Beginning in 1994, and continuing annually since, extensive, systematic Willow Flycatcher surveys have taken place in riparian habitat along the Gila River in the Cliff/Gila Valley and over the past few years along the Gila River downstream of Redrock. This presentation will present the historical data of populations found along the Gila River and the implications for their management.

CATASTROPHIC AVIAN MORTALITY DURING HEAT WAVES AND DROUGHT: THE ROLE OF CLIMATE CHANGE AND EXTREME EVENTS

BLAIR O. WOLF, Department of Biology, MSC03-2020, University of New Mexico, Albuquerque, NM 87131-0001 and ANDREW E. MCKECHNIE, DST/NRF Centre of Excellence at the Percy FitzPatrick Institute, Department of Zoology and Entomology, University of Pretoria, Pretoria 0002, South Africa

Predicting how human-induced climate change will affect animal distribution, abundance and diversity requires an understanding of the mechanisms underlying both the direct and indirect effects. Although little studied, among the most important direct effects may be catastrophic mortality associated with extreme heat and drought. Climate models predict an increase in both the frequency and severity of these extreme climate events, and historical records demonstrate the potential for catastrophic mortality. Here we quantify the functional mechanisms underlying avian mortality associated with heat stress and the lack of water. We develop a physiological model that predicts rates of evaporative water loss and survival times as a function of body mass and dehydration tolerance. Current and historical accounts already document catastrophic mortality caused by hyperthermia or through dehydration. Our projections suggest that increasing global temperatures, combined with increased frequency and intensity of heat waves and drought, will result in more frequent catastrophic mortality, and could depopulate regional bird communities.

CHANGES IN LATITUDE, CHANGES IN ATTITUDE: GLOBAL WARMING AND THE CHANGING DISTRIBUTION AND STATUS OF NEW MEXICO'S BIRDS

SARTOR O. WILLIAMS III, Division of Birds, Museum of Southwestern Biology, University of New Mexico, Albuquerque, NM 87131

Global climates are undergoing rapid change, apparently due to the effects of human activity on the atmosphere. These changes are predicted to have dire consequences for life on Earth, and birds are often used as examples of what may be in store, including changes in distribution, changes in phenology, changes in population size and recruitment, and changes leading to local extirpation or outright extinction. Many predictions are based on climate models and general life history attributes of species, but a growing number of studies have begun to quantify these changes. New Mexico currently has 523 verified species, and in recent decades many of these have experienced changes in range, timing of migration and breeding, and population size, and these involve permanent residents, summer and winter residents, and through migrants. Many of these changes may be related to global climate change, although the precise mechanisms (e.g., warmer summers, warmer winters, increases or decreases in habitat, etc.) undoubtedly vary among species and/or species groups. Using New Mexico bird data from multiple sources, I will provide numerous examples of recent and ongoing changes, and discuss these in relation to global climate change and the future of New Mexico's avifauna.

POSTER PRESENTATION

SPATIAL VARIATION IN GRAY VIREO HABITAT ATTRIBUTES

CHUCK L. HAYES, University of New Mexico, Department of Biology and New Mexico Department of Game and Fish, One Wildlife Way, Santa Fe, NM 87507

The Gray Vireo (*Vireo vicnior*) is a state-threatened species whose habitats appear to be relatively widespread and variable. Known territories of Gray Vireos are highly clustered, with over 80% of documented territories in New Mexico occurring at 12 clusters. I examined landscape variables associated with clusters (sites) of Gray Vireo locations using GIS, with an objective on identifying landscape-level patterns of habitat use. Sixty-one percent of mapped Gray Vireo locations occurred on gentle and toe slopes. Elevation, slope, and distance to edge of juniper distribution all differed significantly

among sites. Variation in elevation, slope, and distance to juniper edge did not vary in consistent patterns among sites, and did not show a directional (e.g., south-north) gradient. Selection of habitats by Gray Vireos may be location-specific, as opposed to occurring at a broader landscape scale.

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NMOS FLORENCE MERRIAM BAILEY LIFETIME ACHIEVEMENT AWARD

The New Mexico Ornithological Society Officers and Board of Directors are pleased to present the NMOS Florence Merriam Bailey Lifetime Achievement Award to Dr. James R. Travis. Travis is one of the founders of the NMOS and served as NMOS President from 1966 to 1972 and again from 1994 to 1998. Travis has been an active bird bander for over 22 years, an activity which added to New Mexico's list of bird species the first Rusty Blackbird, Clay-colored, Field, and Golden-crowned sparrows, "White-winged" Junco, American Redstart, and Scarlet Tanager. Though a physicist by training, having a career at Los Alamos National Laboratories (from 1957 to 1990), he has participated in numerous avian research projects. Travis publishing an article, with Bill Huey, in *The Auk* (78:607-626, 1961) as a follow up on Alexander Wetmore's study of the avifauna of Burford Lake in Rio Arriba County. Travis became an expert and the prime source of information in the state on sonograms of bird calls—he documented Gray and Hammond's flycatchers breeding in New Mexico through the use of this tool. More recently Travis collaborated with the New Mexico Department of Game and Fish on Yellow-billed Cuckoo and Willow Flycatcher studies. Further, Travis helped to initiate a survey of breeding birds in Los Alamos County which resulted in the publication *Atlas of the Breeding Birds of Los Alamos County*. Congratulations to Dr. Travis!

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NEW MEXICO ORNITHOLOGICAL SOCIETY

— Founded 1962 —

The New Mexico Ornithological Society was organized to gather and disseminate accurate information concerning the bird life of New Mexico; to promote interest in and appreciation of the value of birds, both aesthetic and economic, to further effective conservation of the state's avifauna; to facilitate opportunity for acquaintance and fellowship among those interested in birds and nature; and to issue publications as a means of furthering these ends.

Membership and Subscriptions: Membership in the New Mexico Ornithological Society is open to anyone with an interest in birds. Memberships are for a calendar year and annual dues are payable 1 January. Dues are: Regular Membership $20; Family $30; Student $10; Supporting $50; Life $500. Address for the New Mexico Ornithological Society: Post Office Box 3068, Albuquerque, NM 87190-3068.

NMOS BULLETIN

The *Bulletin* is published quarterly; subscription is by membership in NMOS. The *Bulletin* serves two primary purposes: (1) to publish articles of scientific merit concerning the distribution, abundance, status, behavior, and ecology of the avifauna of New Mexico and its contiguous regions; and (2) to publish news and announcements deemed of interest to the New Mexico ornithological community.

NMOS members are encouraged to submit articles and news. Articles received are subject to review and editing. Published articles are noted in major abstracting services. Please submit articles in double-spaced electronic format, such as a Microsoft Word document, by e-mail to the Editor (see inside front cover). Refer to recent issues of the *Bulletin* for examples of style. News items may be submitted to the Editor by way of e-mail.

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