2001
SOUTHWESTERN WILLOW FLYCATCHER STUDY RESULTS

Selected Sites Along the Rio Grande
From Velarde, New Mexico, to the
Headwaters of Elephant Butte Reservoir

Prepared by
Darrell Ahlers, Claire Solohub, Eric Best and Juddson Sechrist

U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Ecological Planning and Assessment
Denver, Colorado
February 2002

TABLE OF CONTENTS

SUMMARY S-1

INTRODUCTION 1

METHODS 5
- Presence/Absence Surveys 5
- Nest Searches/Monitoring 12
- WIFL Habitat Suitability Model 12
  - Vegetative Delineation 16
  - Hydrologic Component Delineation 16
  - Habitat Suitability Map 17

RESULTS 17
- Presence/Absence Surveys 17
  - La Canova 24
  - La Rinconada 24
  - Bosque Channel Widening Site 24
  - SV-03 24
  - SV-04 26
  - SV-09 26
  - LFCC-5A 26
  - LF-11 26
  - LF-17 26
  - LF-17A 27
  - LF-27 27
  - LF-29 27
  - LF-30 27
- Species of Special Concern 27
- Nest Searches/Monitoring 28
  - Miscellaneous Sites 28
  - Sevilleta NWR/La Joya State Wildlife Area 28
    - SV-03 28
    - SV-09 28
  - San Marcial reach 32
    - LF-11 32
    - LF-17 32
    - LF-17A 32
- WIFL Habitat Suitability Model 38

TABLE OF CONTENTS (continued)

DISCUSSION AND RECOMMENDATIONS 48
Presence/Absence Surveys 48
Nest Searches/Monitoring 51
Velarde Area 51
San Marcial reach 51
Sevilleta NWR/La Joya State Wildlife Area reach 52
WIFL Habitat Suitability Model 53

LITERATURE CITED 55

Appendix A - Willow Flycatcher Nest Site Data and Monitoring Forms
Appendix B - Willow Flycatcher Survey and Detection Forms
Appendix C - Willow Flycatcher Survey Summaries

Tables

Table 1. WIFL survey schedule for the 2001 season 11
Table 2. Proposed southwestern willow flycatcher habitat categories based on vegetation classifications presen
Table 3. Summary of 2001 WIFL detections 19
Table 4. Nest monitoring results for the Sevilleta NWR/JaJoya State Wildlife Area 31
Table 5. Nest monitoring results for the San Marcial reach of the Rio Grande 33
Table 6. Total hectares of WIFL habitat categories on the Rio Grande between San Acacia Diversion Dam and the head of Elephant Butte Reservoir 45
Table 7. Summary of southwestern willow flycatcher nest monitoring (1994-2001) - downstream of railroad bridge to Elephant Butte Reservoir delta 49

Figures

Figure 1. Breeding ranges of the willow flycatcher subspecies (USFWS 2001) 2
Figure 2. General locations of 2001 survey sites 3
Figure 3. Overview of WIFL survey sites within San Marcial reach 7
Figure 4. Sevilleta NWR/JaJoya State Wildlife Area survey reach 8
Figure 5. Selected survey sites within the San Acacia reach 9
Figure 6. Survey sites within the Velarde area 10
Figure 7. Vegetation structure types, Middle Rio Grande riparian zone (Hink and Ohmart 1984) 14
Figure 8. Southwestern willow flycatchers observed in the Velarde area in 2001 21
Figure 9. Southwestern willow flycatchers observed in the Sevilleta NWR/JaJoya State Wildlife reach in 2001 22

TABLE OF CONTENTS (continued)

Figure 10. Southwestern willow flycatchers observed in the San Marcial reach in 2001 23
Figure 11. San Marcial reach summary 25
Figure 12. Species of special concern within the San Marcial reach (railroad trestle to Elephant Butte Reservoir 29
Figure 13. Species of special concern within the Sevilleta NWR/JaJoya State Wildlife Area and San Acacia Diversion Dam to Escondida Bridge reaches 30
Figure 14. Six study areas between Highway 60 and Elephant Butte Reservoir evaluated using the WIFL habitat suitability model 40
Figure 15. WIFL habitat suitability (map 1 of 4) 41
Figure 16. WIFL habitat suitability (map 2 of 4) 42
Figure 17. WIFL habitat suitability (map 3 of 4) 43
Figure 18. WIFL habitat suitability (map 4 of 4) 44
Figure 19. Relation of highly suitable habitat and aggradation/degradation along the Rio Grande from San Acacia Diversion Dam to Elephant Butte Reservoir 46
Figure 20. Rio Grande riverflows required to achieve overbank flooding at various terrace heights 47

SUMMARY

Since 1995, the U.S. Bureau of Reclamation (Reclamation) has conducted presence/absence surveys for the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) at selected sites within the Rio Grande Basin. Surveys were completed in accordance with approved protocol (Sogge et. al. 1997), including the latest USFWS revisions (USFWS 2000). Nest searches and nest monitoring were also conducted in conjunction with the survey efforts, as well as the development of a WIFL habitat suitability model. Additional studies to address willow flycatcher (WIFL) issues have also been conducted since 1995. These studies include, cowbird trapping, cowbird radiotelemetry studies, and an assessment of livestock grazing impacts. Detailed information on these studies can be found in accompanying documents. A brief overview of these studies has been included in this report, where appropriate.

Survey Results

In 2001, 84 willow flycatchers (WIFLs) were observed (47 males and 37 females) as a result of surveying efforts. Ten were believed to be migrants, based on detections only during the first survey period or early in the second survey period, and their lack of territorial behavior. The remaining 74 (38 males and 36 females), believed to be southwestern willow flycatchers, established 37 territories and 36 pairs. The following is a reach-by-reach summary of the survey results.

- San Marcial/Elephant Butte Reservoir - [WIFL surveys and nest monitoring have not been conducted on lands north of the railroad bridge since 1996].
  - Since 1995, WIFL territories and nests below the railroad bridge have increased
  - No WIFL territories were found in this reach in 1995.
  - Thirteen WIFL territories were identified in 1996, 10 in 1997, 11 in 1998, 12 in 1999, and 23 in 2000.
  - In 2001, 25 territories were established in this reach.
  - WIFLs are concentrated within an area immediately above the conservation pool of Elephant Butte Reservoir in sites known as LF-17 and LF-17A. Twenty-two of the 25 territories within this reach were found at these two sites.

- Sevilleta NWR/La Joya State Wildlife Area
  - This population was first found in 1999 and four territories were identified.
  - The entire reach was first surveyed in its entirety in 2000, and eight territories were found.
  - In 2001 only those sites which supported WIFLs in 2000 were surveyed. A total of 11 territories were found.

- Velarde Sites - WIFL territories in the Velarde area of northern New Mexico, which include

the La Canova, Garcia Acequia, and La Rinconada sites, have declined in recent years.

- In 1995, six territories were established at these sites, four in 1996, five in 1997, two in 1998, two in 1999, and two in 2000.
- In 2001 only one territory was established at the La Canova site in this reach.

- Miscellaneous Sites - No WIFL territories were found.

  - Since 1995, numerous riparian sites within several Pueblos, Acequias, the City of Albuquerque, Jarales Bridge, etc. have been surveyed.
  - During the 2001 season, one site within the City of Albuquerque, and another within the Bosque del Apache NWR were surveyed - no WIFLs were found.

During the 2001 season, an additional two surveys were required by the USFWS (USFWS 2000). Three surveys were required from 1997-2000. No new occupied WIFL sites were discovered as a result of the additional surveys. However, a non-territorial (migrant) male was detected during the fourth survey at the La Canova site, near Velarde, NM, and one additional pair was discovered within the Sevilleta NWR/La Joya State Wildlife Area reach. Therefore, 97 percent of the southwestern willow flycatchers detected during the 2001 season, were found within the first three survey periods. The additional surveys did however, provide greater confidence to the absence of the species in the unoccupied sites.

Nest Monitoring Results

During the 2001 season 45 nesting attempts were documented: 33 were believed successful, 11 were known to have failed, and the outcome of 1 is unknown. [One nest was not found although success was confirmed by the observation of a WIFL fledgling]. Successful nests included those which supported chick(s) 8 to10 days old on the last nest visit. The 33 successful nests are believed to have fledged approximately 91 young.

- San Marcial/Elephant Butte Reservoir

  - WIFL nesting activity has significantly increased downstream of the railroad bridge since 1996. A single nests was found in 1996, two in 1997, two in 1998, five in 1999, and 19 in 2000.
  - Thirty-six nests were found in 2001 [which includes four re-nests and 10 second broods].
  - In 2001, 27 of the 36 nests were successful, fledging approximately 79 young. Nine nests failed; 7 were predated and two were abandoned.

- Sevilleta NWR/La Joya State Wildlife Area

- The number of documented WIFL nests has increased since 1999. In 1999, four nests were found, six in 2000, and nine in 2001.
- Of the nine nests found in 2001, six are believed to have been successful, fledging approximately 11 young.

- Velarde Sites

  - In 1995 nest monitoring was not conducted at these sites.
  - In 1996 two failed nesting attempts were observed (NMNHP 1996) In 1997 six nesting attempts were recorded, however only one of these nesting attempts may have been successful. Three nesting attempts were recorded in 1998 one of the nesting attempts was successful, one failed, and one was unknown; in 1999 a single failed nesting attempt was observed. Two nesting attempts were recorded in 2000, both with unknown outcomes.
  - In 2001, no nests were found within the single territory at La Canova, although nesting was suspected.
  - Predation appears to limit success at these sites, probably due to fragmented habitat near human development.

Cowbird Parasitism

- San Marcial/Elephant Butte Reservoir - This area has been subject to cowbird trapping since 1996. However, cowbird trapping is not believed to be responsible for the reduced level of parasitism on WIFL nests in this area (Ahlers and Sechrist 2002).

  - Of the 65 WIFL nests found below the railroad bridge since 1996, only 3 have been parasitized (5 percent).
  - None of the 36 WIFL nests found in 2001 were parasitized.

- Sevilleta NWR/La Joya State Wildlife Area

  - From 1999 to 2001, 18 WIFL nests have been monitored within this reach and seven have been parasitized (39 percent).
  - In 2001, five of the nine nesting attempts were parasitized, however only one resulted in direct nest failure; 1)nest fledged a BHCO and 2 WIFL chicks; 2) nest fledged a single BHCO chick; 3) nest parasitized with two BHCO eggs and latter predated; 4) nest parasitized, but BHCO egg didn't hatch and 2 WIFL chicks successfully fledged; and 5) nest parasitized, however BHCO chick removed and nest successfully fledged 2 WIFL chicks.

- Velarde Sites

  - Of the 14 nesting attempts documented at the various Velarde sites since 1996, only two

have failed due to parasitism.
- No nests were found in 2001.

Nest Site Characteristics

Nest site characteristics are typical of those described in Sogge et. al. (1997). WIFLs prefer sites with dense vegetation, interspersed with small openings in close proximity to open water and/or saturated soils.

A WIFL habitat suitability model was developed in 1998 to estimate the extent of habitat suitability within the Highway 60 bridge to Elephant Butte Reservoir reach of the Rio Grande. The Model continues to be refined based on changes in hydrology, and updated vegetation maps. The geographic information system (GIS) ArcView-driven model identifies breeding habitats of (1) highly suitable native, (2) suitable mixed native/exotic, (3) marginally suitable exotic, (4) potential with future riparian growth and development, and (5) low suitability. With the exception of low suitability habitats, all remaining suitability categories were required to meet the hydrologic parameter of < 100 meters from surface water.

- San Marcial/Elephant Butte Reservoir

  - Most of the highly suitable riparian habitat within the San Marcial reach has developed during the past decade following periodic flooding and sediment deposition.
  - The concentration of WIFLs at sites LF-17 and LF-17A is likely a result of quality habitat that developed from flooding in the immediate area due to breaches in the Low Flow Conveyance Channel.
  - Overbank flooding at the remainder of sites below the railroad bridge was limited during the 2001 season.

- Sevilleta NWR/La Joya State Wildlife Area

  - The Sevilleta NWR/La Joya State Wildlife Area reach is not subject to overbank flooding, although moist soils were present at all territories.
  - The Sevilleta NWR/La Joya State Wildlife Area site is dominated by saltcedar (*Tamarix chinensis*) and Russian olive (*Elaeagnus angustifolia*), however in 2001 four of the nine nest sites included a native cottonwood/willow component. The remaining five nest sites were dominated by exotic vegetation.

- Velarde Sites

  - The extent of native cottonwood/willow habitat at these sites has not noticeably decreased in recent years, nor has the frequency and duration of overbank flood events.

However, noxious weeds may be increasing as an understory component at these sites. Nevertheless Actually, the density and structure of the vegetation is believed to have increased as a result of maturing stands of native coyote willow.

The nest substrate of the 44 WIFL nests which were found within the Sevilleta NWR/La Joya State Wildlife Area reach and San Marcial reach (railroad bridge to Elephant Butte Reservoir) during the 2001 season was evaluated. Although 54 percent of the nests were placed on exotic plants (Russian olive/saltcedar), the habitat patch was typically dominated by natives (cottonwood/willow).

- Four nests were found in Russian olive(9 percent); 20 in saltcedar (45 percent); 14 in Gooddings willow (32 percent); and six (14 percent) in coyote willow.
- The dominate vegetation surrounding 37 of the nest sites (84 percent)was native species; exotic vegetation dominated the nest site at 4 of the locations (9 percent); and a mixed native/exotic community surrounded the remaining 3 nest sites (7 percent).

These data suggest that WIFLs may key in on areas dominated by native vegetation, but often select exotic vegetation, particularly saltcedar, as the nest substrate. Saltcedar may be the WIFL=s nest substrate of choice due to its dense, vertical twig structure.

Livestock and Cowbird Association

Cattle were removed from public lands below the railroad bridge during the WIFL breeding season from 1997 through 2001. The removal of cattle during the WIFL breeding season was initiated in an effort to reduce the potential for brood parasitism by brown-headed cowbirds which associate with cattle, and to limit physical disturbance by cattle to the occupied WIFL sites. Based on available data (Ahlers and Tisdale-Hein 2000), it is assumed that cattle may concentrate local BHCO populations, but may not actually increase localized BHCO populations on the Middle Rio Grande.

Cowbird point counts were conducted within four river reaches to compare the association of cowbirds with various grazing regimes (Ahlers and Sechrist 2002).

- Female cowbird densities during the 1999, 2000, and 2001 breeding seasons were 3 to 3.5 times greater within the ungrazed Sevilleta NWR/La Joya State Wildlife Area reach than within the ungrazed and trapped San Marcial reach, and 2 times greater than within the San Acacia reach which is subject to year-round grazing.
- The Sevilleta NWR/La Joya State Wildlife Area reach supported the greatest density of female cowbirds when compared to all other monitored reaches.
- This data suggests that factors other than livestock also contribute to the density of cowbirds within any specific reach.

Status of WIFL in the Middle Rio Grande

As defined by the Draft Recovery Plan for the Southwestern Willow Flycatcher (USFWS 2001) the Middle Rio Grande extends from Cochiti Reservoir to Elephant Butte Dam. The recovery goal for this reach is 100 WIFL territories. Approximately 60 WIFL territories are currently established in this reach, including: 14 WIFL territories at the Isleta Pueblo (based on 2000 survey results) (Ahlers

et. al. 2001); 11 territories within the Sevilleta NWR/La Joya State Wildlife Area reach; an estimated 8-10 territories on private lands from the south boundary of the Bosque del Apache Refuge to the railroad bridge; and 25 territories from the railroad bridge to Elephant Butte Reservoir.

Recommendations

- San Marcial/Elephant Butte Reservoir
  - Nest monitoring should continue in conjunction with presence/absence surveys at all sites within the San Marcial reach in an effort to determine the population trend of WIFLs within the Middle Rio Grande Basin. Nest monitoring will also help to identify potential threats to the local WIFL population.
  - The removal of cowbird eggs or chicks from parasitized WIFL nests should be initiated in leu of cowbird trapping.

- Sevilleta NWR/La Joya State Wildlife Area
  - Nest monitoring should continue in conjunction with presence/absence surveys at all sites within the Sevilleta NWR/La Joya State Wildlife Area in an effort to determine the population trend of WIFLs within the Middle Rio Grande Basin. Nest monitoring will also help to identify potential threats to the local WIFL population
  - The removal of cowbird eggs or chicks from parasitized WIFL nests should be initiated in an effort to reduce the effects cowbird parasitism.

- Velarde Sites
  - Nest searches and monitoring should continue in conjunction with all presence/absence surveys conducted within the Velarde area. When possible, nest monitoring efforts should focus on determining the direct cause of nest failure. Nest failure at the Velarde sites is believed to be one of the leading causes of decline in this area.
  - The removal of cowbird eggs or chicks from parasitized WIFL nests should be initiated in an effort to reduce the effects cowbird parasitism.

- In addition to the sites identified above, any public sites within the Middle Rio Grande where suitable habitat has become established should be surveyed through a cooperative effort with other State and Federal agencies and private organizations which have a vested interest in the recovery of this species. Any private lands where permission is granted that support suitable habitat should be identified and surveyed through a cooperative effort with the landowner and the respective State or Federal agency or private organization.

- Habitat Modeling

  - The WIFL habitat suitability model should continue to be refined. Future studies are needed to evaluate additional WIFL habitat relationships: (1) At what age, structure, and species composition do recently established stands of riparian vegetation become highly suitable for WIFL breeding territories? (2) At what age, structure, and species composition do older, previously occupied stands of habitat become less suitable? and (3) What is the relationship of patch size, width, and openings to suitability? In addition, the proximity and duration of surface water/moist soil at nest sites should be documented for future suitability modeling.

INTRODUCTION

The southwestern willow flycatcher (*Empidonax traillii extimus*) is an insectivorous, neotropical migrant that nests in dense riparian or wetland vegetation in the Southwestern United States (Figure1). Willow flycatchers (WIFLs) generally arrive at their breeding grounds between early May and early June; by late July or August, they depart for wintering areas believed to be in Mexico, Central America, and possibly South America (Sogge et. al. 1997). They have been observed in Costa Rica during the winter of 1998-1999 and 1999-2000 (Sogge pers. comm. 2000). Field surveys are conducted to determine the distribution and abundance of the endangered WIFL during the relatively brief breeding season when they become a seasonal resident of the Southwestern United States.

Recent studies indicate that southwestern willow flycatcher populations have declined across their range (Federal Register 1995). The primary reasons for declining populations are likely a result of habitat loss or modification and brood parasitism by the brown-headed cowbird (*Molothrus ater*) (BHCO) (Federal Register 1995). The U.S. Fish and Wildlife Service (USFWS) officially listed the southwestern willow flycatcher as an endangered species in February 1995 (Federal Register 1995). The southwestern willow flycatcher is also listed as an endangered species or species of concern in New Mexico, Arizona, Utah, and California (Sogge et. al. 1997). A draft southwestern willow flycatcher recovery plan has been developed and is currently under review. A series of issue papers associated with the recovery of the southwestern willow flycatcher have also been prepared by the Recovery Team. These papers address current issues and recommend management alternatives in regard to BHCO parasitism, livestock grazing, water management, exotic vegetation, habitat restoration, fire management, and recreational impacts. All issue papers are appendices to the draft recovery plan.

Staff from the U.S. Bureau of Reclamation (Reclamation) have conducted presence/absence surveys, and nest monitoring during the May to August breeding season, within the Rio Grande Basin since 1995. In 1994, the New Mexico Natural Heritage Program (NMNHP) conducted presence/ absence surveys and nest monitoring within the San Marcial reach under a contract with Reclamation.

The 2001 presence/absence surveys for WIFLs were conducted at selected sites along the Rio Grande from Velarde, New Mexico, to the headwaters of Elephant Butte Reservoir (Figure 2). Surveys were completed between May 17 and July 27, 2001. Nest searches and nest monitoring of WIFL nests were conducted in conjunction with survey efforts by permitted biologists. In addition to conducting presence/absence surveys for the WIFL, an asserted effort was conducted within the San Marcial reach to determine the distribution and abundance of five additional avian species of special concern: yellow-billed cuckoo *(Coccyzus americanus)*, Bell's vireo *(Vireo bellii)*, yellow warbler *(Dendroica petechia)*, summer tanager (*Piranga rubra*), and common ground-dove (*Columbina passerina*).

Figure 1. Breeding ranges of the willow flycatcher subspecies (USFWS 2001)

Figure 2. General locations of 2001 survey sites.

The primary objectives of these surveys were to gather information on the distribution, abundance, and population trends, and to increase our knowledge of specific habitat requirements of the WIFL within the Rio Grande Basin of New Mexico. This information is crucial for resource specialists to make sound management and biological decisions that could potentially affect the WIFL.

In addition to the presence/absence surveys and nest monitoring conducted in 2001, the following related studies were either previously conducted, or continued in 2001:

- A BHCO trapping program was continued within the San Marcial reach in an effort to reduce the potential for brood parasitism on the endangered WIFL. A total of 578 BHCOs (304 males, 252 females, and 22 juveniles) were captured and removed from local populations during the 2001 breeding season. The results of this program are discussed in detail in *Cowbird Control Program: Middle Rio Grande, New Mexico, 2001* (Ahlers and Sechrist 2002).

- A radio telemetry study of cowbirds was previously conducted in 1998 and 1999 to determine daily and seasonal movements. Twenty-one female BHCOs were captured and fitted with radio transmitters during the 1999 neotropical migrant landbird breeding season. The maximum daily distance and maximum seasonal distance between any two points for all BHCOs averaged 1.5 km (kilometers) and 3.3 km, respectively. For a detailed discussion of the methods and results of this study refer to *Brown-headed Cowbird Movements and Distribution within the Middle Rio Grande, New Mexico* (Ahlers and Sechrist 2000).

- Monitoring of potential BHCO hosts♠ nests was continued to determine the effectiveness of the cowbird trapping effort and to gain a better understanding on the distribution and abundance of BHCOs throughout the Middle Rio Grande. Parasitism levels, nest success, and nest productivity of selected highly suitable hosts within the trapping area were compared to those within two adjacent areas at least 12 km from the trapping area. Neither of the adjacent areas have been subject to BHCO trapping, however one of the areas supported year-round grazing and the other did not support any livestock grazing. Preliminary results suggest that trapping maybe an effective tool for reducing brood parasitism, however factors such as habitat, predation, and nest abandonment appear to outweigh the beneficial aspects of BHCO trapping; no significant increase in nest success was observed. Further information on this study can be found as a component of the *Cowbird Control Program: Middle Rio Grande, New Mexico, 2001* (Ahlers and Sechrist 2002).

- BHCO point counts were continued to determine their distribution and abundance within the Middle Rio Grande Basin. Transects were established within four study areas in an effort to determine the distribution and density of BHCOs in each of these areas and to help determine the effectiveness of the cowbird trapping program. Based on 1998 - 2001 data,

the areas supporting the greatest mean number of BHCOs were within the Bosque del Apache National Wildlife Refuge (NWR), and Sevilleta NWR/La Joya State Wildlife Area areas not subject to livestock grazing. Livestock grazing was present adjacent to each of these areas, however based on telemetry data cowbirds in this reach of the Rio Grande traveled less than 2 km on a daily basis between feeding and breeding areas. The higher numbers of cowbirds could be a result of greater host densities and/or the availability of alternative food resources. The frequency and mean of BHCOs within the trapping area were less than that of another adjacent study area which has not been subject to cowbird trapping and supports year-round livestock grazing. This data suggests that cowbird trapping is effective at reducing the distribution and abundance of BHCOs. The methods and results of this study can also be found as a component of the *Cowbird Control Program: Middle Rio Grande, New Mexico, 2000* (Ahlers and Sechrist 2001), and *Brown-headed Cowbird Movements and Distribution Within the Middle Rio Grande, New Mexico* (Ahlers and Sechrist 2000).

- A study to monitor and evaluate the impacts of livestock grazing on the establishment and development of riparian vegetation was also continued. This study was initiated in 1997 to determine the effects of seasonal livestock grazing on (1) the potential future habitat of the endangered WIFL and (2) physical disturbance to existing occupied habitats. Data from a series of established livestock exclosures, photo stations, and seasonal dietary analysis are currently being collected and processed. Study data are presented in: *Preliminary Report: Browsing Analysis of Riparian Vegetation, Elephant Butte Public Lands, Socorro, New Mexico, November 1997 to April 1999* (Ahlers 1999); and *Preliminary Report: Browsing Analysis of Riparian Vegetation, Elephant Butte Public Lands, Socorro, New Mexico, November 1999 Data Update* (Ahlers 2000).

For additional information on any of Reclamation's related WIFL studies, please contact Reclamation's Albuquerque Area Office, Albuquerque, New Mexico.

METHODS

Presence/Absence Surveys

Potential survey sites were selected based on the findings of previous survey efforts and through field reconnaissance by Reclamation's Albuquerque Area Office personnel (Figure 2). The San Marcial reach was divided into smaller sites based on vegetative homogeneousity, structure, time, and accessibility (Figure 3). Presence/absence surveys were also conducted at selected sites within the Sevilleta NWR /La Joya State Wildlife Area in 2001(Figure 4). Two sites downstream from San Acacia Diversion Dam LF-01 and LF-03 were surveyed (Figure 5), and sites in the Velarde area were also surveyed (Figure 6). All sites were surveyed in accordance with Sogge et al. (1997) and the USFWS revised protocol (USFWS 2000), using the repeated tape-playback method. Surveys were conducted 5 to 14 days apart, generally between 0530 and 1030 by

trained and permitted personnel. Survey forms were completed for each respective site.

Figure 3. Overview of WIFL survey sites within San Marcial reach.

Figure 4. Sevilleta NWR /La Joya State Wildlife Area survey site (La Joya 7**.** minute USGS quad to scale).

Figure 5. Selected survey sites within the San Acacia reach.

Figure 6. Survey sites within the Velarde area (Velarde 7**.** minute USGS quad map to scale).

A minimum of 5 surveys were conducted in 2001 to achieve a higher degree of confidence regarding the presence or absence of the WIFL, compared to the 3 surveys conducted in previous years. Survey dates are summarized in Table 1.

Table 1. WIFL Survey Schedule for the 2001 field season

Survey Number	Survey Period
1	May 17 - June 4
2	June 5 - June 21
3	June 22 - July 9
4	July 10 - July 18
5	July 19 - July 27

The first survey was conducted in late May to early June to increase the likelihood of detection, since territorial males are more vocal when establishing territories than after nesting has begun. It was anticipated that migrant WIFLs would also be detected. The second and third surveys were conducted between early June and early July to (1) confirm the establishment of territories and/or nesting, (2) detect late settling males, and (3) determine which sites remained occupied throughout the breeding season. The fourth and fifth surveys, conducted from mid-late July, were initiated in 2001 to derive a greater degree of confidence regarding the breeding status, habitat association, or presence/absence of WIFLs at the selected sites.

Each site was surveyed as thoroughly as conditions would allow. Sites in the Velarde and Sevilleta/LaJoya areas were generally accessible with dry conditions occurring during all surveys. Several sites within the San Marcial reach were subject to overbank flooding early in the 2001 breeding season and were difficult to access due to high water levels.

When WIFLs were detected UTM coordinates were obtained at the site and the senior on-site biologist was notified. If pairing was confirmed or suspected, a nest search was initiated within 24 hours of detection by a permitted biologist.

Surveyors also documented the occurrence of other avian species of special concern within the San Marcial reach. These species included the yellow-billed cuckoo, Bell's vireo, yellow warbler, summer tanager, and common ground-dove. When an individual was detected by either sight or sound, UTM coordinates were obtained for the site, and a Species of Special

Concern form was completed.

Nest Searches/Monitoring

Nest searches were conducted by a permitted biologist, and technicians under the supervision of a permitted biologist, within 24 hours if pairing was confirmed or suspected. The nest area was located by observing diagnostic flycatcher breeding behavior and listening for calls within the habitat patch. Once located, the nest site was approached cautiously, with minimum disturbance to vegetation. Typically, adult WIFLs did not immediately reveal the nest locations. All suitable midstory trees and shrubs in the suspected area were carefully inspected until the characteristic small, cup-shaped nest described in Tibbitts et al. (1994) was found. Nests were usually located within a few minutes.

The following data were collected at all nest sites: clutch size, number and age of young, presence of cowbird eggs or young, habitat characteristics, and other data required by the Willow Flycatcher Nest Site Data form. Nest contents were not examined during the nest building/egg laying stages the period when disturbance may cause adults to abandon the nest. Nests with eggs/young were examined quickly using a mirror mounted on a telescoping pole. Nesting chronology was subsequently estimated following the initial search and examination. Subsequent visits were minimized and timed so at least one inspection would be made of eggs and nestlings.

WIFL Habitat Suitability Model

Development of a WIFL habitat suitability model was initiated in 1998, and continues to be refined based on changes in hydrology, and updated vegetation maps. Vegetation within the San Acacia Diversion Dam to Elephant Butte Reservoir reach had been classified using the Hink and Ohmart (1984) classification system through a cooperative effort with the U.S. Forest Service. This system identifies vegetation polygons based on dominate species and structure (Figure 7). Plant community types are classified according to the dominate and/or codominate species in the canopy and shrub layers. A species is considered dominate if it constitutes at least 50 percent of the vegetation in a layer. Species are listed in order of importance in each layer separated by a dash (-); species in different layers are separated by slashes (/), [e.g., C-tw/sc5 = cottonwood - tree willow/saltcedar (*Tamarix chinensis*) 5].

Grouping Hink and Ohmart (1984) classifications based on habitat structure and density required by breeding WIFLs and using the spatial analysis capabilities of a GIS system (ArcView) made it possible to delineate areas based on habitat suitability (Table 2). These groupings were based on best biological opinion regarding habitat requirements of the WIFL.

Our experience within the San Acacia Diversion Dam to Elephant Butte Reservoir reach indicated a need to include a hydrologic component to the model. Breeding habitat suitability

was refined by identifying all areas that were within 100 meters (m) of existing watercourses, ponded water, or in the zone of peak flow inundation. The hydrologic layer, in combination with dominate vegetation and structure, was used to identify those areas with the greatest breeding habitat potential.

The following process outlines the procedure to categorize the existing riparian vegetation, and to define the hydrologic parameters developing the habitat model.

Type 1. Tall or mature to mixed-age class trees (>12.2 m) with well-developed understory vegetation. Substantial foliage in all height layers.	Type 2. Tall or mature trees (<12.2 m) with little or no understory vegetation. Majority of foliage above 9.1 m.
Type 3. Intermediate-sized trees (6.1 to 12.2 m) with dense understory vegetation. Majority of foliage between 0 m and 9.1 m.	Type 4. Intermediate-sized trees (6.1 to 12.2 m), openly spaced, with little understory. Majority of foliage between 4.6 and 9.1 m.
Type 5. Younger stands with dense shrubby growth. Majority of foliage between 0 m and 4.6 m.	Type 6. Very young, low, and/or sparse stands. Majority of foliage between 0 m and 1.5 m.

Figure 7. Vegetation structure types, Middle Rio Grande riparian zone (Hink and Ohmart 1984).

Table 2. Proposed southwestern willow flycatcher habitat categories based on vegetation classifications presented in Hink and Ohmart (1984)

WIFL Habitat Category	Plant Community Types	Forest Service Mapping (Hink and Ohmart 1984) Classifications[1]
Highly suitable native riparian (#100-m surface water)	Monotypic willow	W3, W5
	Native broadleaf dominated	C/W-SC1, C-W3, **C-W/SC3**, C/W5, W/C5, W-C5, C5, **C/W-SC5**, **W-SC5**, **W/C-SC5**, C-SC-W5, **W/SC5**, C-W-SC5, **W-C-SC5**, C-W/SC5, C-SC-RO5,
Suitable mixed native/exotic riparian (#100-m surface water)	Mature mixed native broadleaf, saltcedar and Russian olive	C/SC1, W/SC1, C/SC-RO1, C-W/SC1, C/SC-CW1, W-C/SC1, C/SC-CW-RO1 C-W/SC5-RO1
	Mid-aged mixed native broadleaf, saltcedar and Russian olive	W/SC3, W-C/SC3, C/SC-W3, C-W/SC-RO3, C/W-SC3, W/C-SC3, C-W/SC-RO1, C/SC3, C/RO-SC3, C/SC-RO3, SC-W3
	Young growth mixed native broadleaf, saltcedar and Russian olive	SC/W5, SC-W5, SC-C-W5, SC/W-C5, SC/C5, C-SC5, C/SC5, C/SC-W5, C/SC-RO5, W-C/SC5, C/RO-SC5, C-RO/SC5, C-RO-SC5, RO-SC-C5
Marginally suitable exotic riparian (#100-m surface water)	Monotypic saltcedar	OSC, ISC, SC5
	Mixed saltcedar/Russian olive	SC-RO3, SC-RO5, RO-SC5,
Potential with future riparian vegetation growth and development (#100-m surface water)	Sparse mostly native young growth	C-W6, W6, W-C6, W-SC6, C-SC-W6, C-SC6, C-RO-W6,W-SC-C6, W/MDW6
	Sparse mixed or exotic young growth riparian shrubs	C/SC6, W/SC6, C/SC-RO6, C-SC-RO6, C-RO-SC6, SC-RO6, SC-W6, SC-W-C6, SC-RO-W6, SC-RO-C6, OP-SC5, OP-SC6, RO-SC-C6, USC, SC6
	River bars , openings, dead saltcedar	DSC, DSC/USC, DC1, OP, OP6
	Open stands of mature or mid-aged riparian vegetation	C2, C/SC4, C-W/SC4, W4, SC4
Low Suitability	All others	HABITAT ∃100 m H2O: C/RO5, RO5, C-RO5, RO6, H2O, RIVER, DSC/OVERFLOW, PONDED WATER, ROAD, CANAL

Highly Suitable: Includes portions of polygons that are dominated by native riparian plants of adequate structure with dense understory and are within 100 m of the river channel, high and flow channels, wetlands, ponds, and in the zone of peak flow inundation, or are subject to other types of flooding (beaver dams, Texas crossings, etc.).

Occupied: Bold face indicates specific vegetation types in which WIFL territories have been documented.

Potential with future growth: Includes portions of polygons that indicate plant composition is suitable but structure and/or density needs additional development or other opening that would facilitate recruitment of natives and are within 100 m of surface water as described above (site-specific evaluation is required).

[1] Abbreviations of plant species: C | cottonwood (*Populus deltoides* subsp. *wislizenii*)
W | willow (species undetermined)
TW | tree willow (Goodding's willow) (*Salix Gooddingii*)
CW | coyote willow (*Salix exigua*)
RO | Russian olive (*Elaeagnus angustifolia*)
SC | saltcedar (*Tamarix* sp.)
OSC | overstory saltcedar
ISC | intermediate saltcedar
USC | understory saltcedar
DSC | dead saltcedar
CAT | cattail (*Typha* sp.)

MES | mesquite (*Prosopis glandulosa*)
OP | opening

Vegetative Delineation. For this analysis, riparian vegetation classifications for the project's vegetation maps were placed in habitat categories representing different levels of suitability for breeding WIFLs based on locations of known breeding territories, proximity to water, plant species composition, vegetation density, and height. With the exception of low suitability habitats, all remaining suitability categories were required to meet the hydrologic parameter of < 100 m from surface water. The five categories of WIFL habitat which lie within 100 m of water are defined as:

- Highly suitable native riparian - Stands dominated by willow and/or cottonwood.
- Suitable mixed native/exotic riparian - Includes stands of natives mixed with various compositions of exotics.
- Marginally suitable exotic riparian - Stands composed of monotypic saltcedar or stands of saltcedar mixed with Russian olive.
- Potential with Future Riparian Vegetation Growth and Development - Includes stands of very young sparse riparian plants on river bars that could develop into stands of adequate structure with growth and/or additional recruitment. WIFLs require dense riparian vegetation at least 3 m high for nesting It is estimated that it takes from 5 to 10 years for developing stands of willow to become suitable for nesting after establishment.

Vegetation themes were obtained from maps completed by the U.S. Forest Service from 1996 aerial photographs based on Hink and Ohmart (1984) vegetation classification system. After the vegetation types were combined into a layer delineating vegetative suitability, the following criteria were used to delineate overall habitat criteria based on proximity to surface water.

Hydrologic Component Delineation. A map of all areas, which could contain surface water during the May to July WIFL breeding period, was created using several tools and studies resulting in themes showing surface waters and outputs from flood innundation models. Using the GIS layers created in 1996, Reclamation biologists interpreted all polygons with several classifications to indicate surface water: river, dsc/overflow, ponded water, mdw-cat6, w-mdw6, cat-dsc6, cat6, cat-h2o. The Low Flow Conveyance Channel (LFCC) was not classified as a suitable indicator of surface water because it is usually isolated from suitable riparian vegetation by levees and roads on both sides.

Two additional areas were added to the map by field observations by Reclamation biologists: (1) the entire active flood plain from the middle of WIFL survey area LF-10 south to the 1830 berm which receives widespread overbank flooding during peak flows greater than 2,500 cfs, and (2) the isolated historic river channel downstream of the 1830 berm which has been observed to contain ponded water from elevated water tables during high flow periods.

Additional areas in the upper reach which experience overbank flooding in the spring during peak flows were added by using two studies●1992 Rio Grande High/Low Flow Wetted Area and River Channel Study (1992 Flow study) prepared by Reclamation and the 1999 Middle Rio Grande FLO-2D Model prepared by FLO Engineering, Inc. The 2-year flood 4,530-cfs grid was made to fit the GIS layers and then used to identify additional flooded areas from San Acacia Dam to the railroad bridge south of the San Marcial historic site. GIS layers from the 1992 flow study (average 4,970 cfs) were used to help interpret the FLO-2D study. If the 1992 study did not show an area flooding which the FLO-2D study appeared to show flooded, then the area was not included in the surface water area. To quantify suitable habitat using the WIFL Habitat Suitability Model, a 100-m buffer surrounded the area that contained surface water. Stafford and Valentine (1985), Spencer et al. (1996), Sogge et al. (1997) and Harris et al. (1987) agree that WIFLs establish territories in close proximity to surface water. Within the Middle Rio Grande from 1994 to 2001, all identified breeding territories were established within 50 m of surface water or saturated soils. In many areas, it is difficult to determine the extent of soil saturation adjacent to surface waters, therefore a 100-m buffer was selected in an attempt to include all possible suitable habitats based on existing overbank flooding hydrology data and best biological opinion. The LFCC and major roads were considered to be barriers isolating suitable habitat from water●the 100-m buffer did not cross these areas. The LFCC was not considered suitable surface water for the habitat model due to the absence of associated riparian vegetation.

Habitat Suitability Map.●The surface water and the vegetation themes were converted into 5-m grids. Using GIS, the grids containing suitable vegetation and surface water were selected. The final WIFL habitat was created using the resulting grid. A final map was delineated showing all areas with ratings for WIFL habitat.

The relationship of sediment deposition and the establishment of riparian vegetation was also evaluated. Habitat between the San Acacia Diversion Dam and the headwaters of Elephant Butte Reservoir was divided into 4-km segments. Changes in the volume of sediments from 1972-1992 and the area of highly suitable WIFL habitat were compared by segment.

RESULTS

Presence/Absence Surveys

Presence/absence surveys were conducted from May 17 through July 27. Eighty-four WIFLs were observed (47 males and 37 females). Ten are believed to have been migrants, based on detections only during the first or second survey efforts, and (or) their lack of territorial behavior. The remaining 74 (38 males and 36 females) were believed to be southwestern willow flycatchers.

The 74 southwestern willow flycatchers established 37 territories and 36 pairs. Twenty-nine of the pairs were confirmed by documented nesting attempts. Seven additional pairs were observed; although nesting was suspected, it could not be confirmed in any of these territories.

Of the 45 confirmed nesting attempts, 33 were believed successful, 11 failed, and the outcome of one is unknown. Successful nests include those which supported chick(s) 8 to 10 days old on the last nest visit, however, two nests that were not monitored into the late nestling stage were considered likely to have fledged young, and were thus included in the successful nest count. These nests contained nestlings aged 2 and 7 days old, respectively, on the last visit of the season.

Detection results for 2001 are summarized in Table 3. Figure 8 illustrates WIFL detections within the Velarde area; Figure 9 illustrates detections on the Sevilleta NWR /La Joya State Wildlife Area; and Figure 10 displays detections within the San Marcial reach.

During the 2001 season, an additional two surveys were required by the USFWS (USFWS 2000). No new occupied WIFL sites were discovered as a result of the additional surveys. However, a non-territorial (migrant) male was detected during the fourth survey at the La Canova site, near Velarde, NM, and one additional pair was discovered within the Sevilleta NWR/La Joya State Wildlife Area site (SV-09). Therefore, 97 percent of the southwestern willow flycatchers detected during the 2001 season, were found within the first three survey periods. The additional surveys did however, provide greater confidence to the absence of the species in the unoccupied sites.

Table 3. Summary of 2001 WIFL detections

Site Name	Number of WIFL observed [1]	Estimated number of pairs	Estimated number of *E.t. extimus*	Estimated number of territories	Nests found	Nest success	Comments
La Canova	3 (2%, 1&)	1	3 (2%, 1&)	1	No	N/A	Pair likely nested, though nest was not found. Additional male very vocal, moving over a large portion of site - does not appear to be territorial. Male detected for first time on 4th survey did not appear territorial.
La Rinconada	1 (%)	0	0	0	N/A	N/A	Assumed to be a migrant.
Bosque Channel Widening Site	1 (%)	0	0	0	N/A	N/A	Assumed to be a migrant.
Subtotal Miscellaneous Sites	5 (4%, 1&)	1	3 (2%, 1&)	1	N/A	N/A	No nests found in these sites.
LF-11	3 (2%, 1&)	1	2 (1%, 1&)	1	Yes (1)	Successful (1)	Nest fledged SWIFLs. Additional male assumed to be a migrant.
LF-17	30 (15%, 15&)	15	30 (15%, 15&)	15	Yes (26) [Which includes, nine 2nd broods, two re-nests]	Successful (20) Failed (6)	Twenty nests were assumed to have fledged SWIFLs, though one of these nests was still active as of 8/9, containing 2 SWIFL nestlings ~2 days old. One nest was abandoned along with 2 SWIFL eggs, and five nests failed due to predation. Of these five, three were 1st broods, one was a 2nd brood, and one was a re-nest [2]. Nine second broods were documented: none of the nests were parasitized.
LF-17A	14 (7%, 7&)	7	14 (7%, 7&)	7	Yes (9) [Which includes, one 2nd brood, two re-nests]	Successful (6) Failed (3)	Six nests were assumed to have fledged SWIFLs, though one of these nests was still active as of 8/9, containing 2 SWIFL nestlings ~7 days old. Two nests failed due to predation, resulting in 2 re-nests (one of which was successful, and one of which was abandoned before any eggs were laid, thus accounting for the third failed nest). None of the nests were parasitized.
LF-27	6 (4%, 2&)	2	4 (2%, 2&)	2	No	N/A	Birds still detected on 6/25, but no nests found despite extensive nest searching in site throughout season. Two males are believed to have been migrants.
LF-29	3 (3%)	0	0	0	N/A	N/A	Assumed to be migrants.
LF-30	1 (&)	0	0	0	N/A	N/A	Assumed to be a migrant.

Site Name	Number of WIFL observed [1]	Estimated number of pairs	Estimated number of *E.t. extimus*	Estimated number of territories	Nests found	Nest success	Comments
LFCC-5a	1 (%)	0	0	0	N/A	N/A	Assumed to be a migrant.
Subtotal San Marcial [3]	58 (32%, 26&)	25	50 (25%, 25&)	25	Yes (36)	Successful (27) Failed (9)	Includes all sites below the railroad trestle to the headwater of Elephant Butte Reservoir within the historic flood plain. Includes LF sites 09 to 32, and all LFCC sites.
SV-03	6 (3%, 3&)	3	6 (3%, 3&)	3	Yes (4) [Which includes, one re-nest]	Successful (3) Failed (1)	Three pairs are believed to have occupied this site. Of these 3 pairs, two pairs produced successful broods. The other pair had a failed nesting attempt due to predation, resulting in a re-nest which as of 8/9 contained 2 SWIFL nestlings and one BHCO nestling approximately 12 days old - presumed successful..
SV-04	2 (1%, 1&)	1	2 (1%, 1&)	1	No	N/A	Pair could not be detected after the 3rd survey. No nest was located in site, despite nest searching efforts.
SV-09	13 (7%, 6&)	6	13 (7%, 6&)	7	Yes (5) [Which includes, one re-nest]	Successful (3) Failed (1) Unknown (1)	Three nests fledged SWIFLs. One nest failed due to predation, which resulted in a successful re-nest. One nest was still active with 2 SWIFL eggs as of 8/9.
Subtotal Sevilleta/ La Joya	21 (11%, 10&)	10	21 (11%, 10&)	11	Yes (9)	Successful (6) Failed (2) Unknown (1)	Only sites SV-03, SV-04, and SV-09 were surveyed during the 2001 season.
Totals	**84 (47%,37&)**	**36**	**74 (38%, 36&)**	**37**	**Yes (45)**	**Successful (33) Failed (11) Unknown (1)**	**Of the 84 WIFLs observed, 10 are believed to have been migrants, and 74 are believed to have been *E.T. extimus* - establishing a total of 36 pairs within 37 territories.**

(1) When a single WIFL responded to the tape playback, and there was no evidence of pairing throughout the remainder of the season, it was considered to be a lone male. However, it is possible that some of these individuals may have been females.

(2) A 2nd brood may occur after a WIFL pair has a successful first nesting attempt (ie. young are fledged). A re-nest commonly occurs after an unsuccessful first nesting attempt (due to predation, parasitism, etc.)

(3) The San Marcial reach extends from the south boundary of the Bosque del Apache NWR to the headwaters of Elephant Butte Reservoir. The subreach between the south boundary of the Bosque del Apache NWR and railroad trestle was not surveyed for the fifth consecutive year. This subreach is typically included in the San Marcial reach. An estimated eight to ten territories are likely to have been established in this area. These territories are not included in the San Marcial total.

Figure 8. Southwestern willow flycatchers observed in the Velarde area in 2001.

Figure 9. Southwestern willow flycatchers observed in the Sevilleta NWR/La Joya State Wildlife Area in 2001 (La Joya 7**.** USGS quad (to scale).

Figure 10. Southwestern willow flycatchers observed - 2001 - San Marcial reach.

Willow Flycatcher Nest Site Data forms and Nest Monitoring forms are presented in Appendix A. Detection forms are presented in Appendix B, and a summary of individual survey sites is presented in Appendix C. A summary of WIFL detections within the San Marcial reach (railroad trestle to Elephant Butte Reservoir) from 1994 through 2001 is illustrated in Figure 11. The following is a brief overview of the thirteen sites where WIFLs were detected during the 2001 season.

La Canova is located approximately 2 km north of Velarde, New Mexico, on the west bank of the Rio Grande (UTM Zone 13 south, 412,533 m easting and 4,003,883 m northing) (Figures 6 and 8). This site was surveyed four times during the 2001 season. A single male was observed on May 21. This male was paired with a female by the second survey on June 10. The pair was still present by the third and fourth surveys, on June 25 and July 13 respectively, although no nest was found. An additional male was detected on the fourth survey, however it was moving over a large portion of the site and did not appear to be territorial.

La Rinconada is located near the community of Velarde, New Mexico (UTM Zone 13 south, 410,670 m easting and 4,001,207 m northing) (Figures 6 and 8). This site was surveyed four times during the 2001 season. During the first survey on May 21, a single male was detected. No WIFLs were detected on June 10, June 26, or July 13, thus the male was determined to be a migrant.

Bosque Channel Widening Site is located within the Bosque del Apache NWR, and extends along the west bank of the Rio Grande (UTM Zone 13 south, from 326,054 m easting and 3,737,348 m northing, to 326,023 m easting and 3,736,984 m northing (Page B-19). This site remained relatively dry over the 2001 season, during which time five surveys were conducted. On June 1, a single male was detected in a tall willow near the river. No WIFLs were detected on June 14, July 9, July 16, or July 26, thus the male detected during the first survey was determined to be a migrant.

SV-03 is located within the Sevilleta NWR/La Joya State Wildlife Area reach and is

dominated by saltcedar, with a Russian olive component. The saltcedar/Russian olive vegetation provides similar density and structure as observed at WIFL territories dominated by native vegetation. This site was surveyed four times during the 2001 season. Although the SV-03 site remains drier than where WIFLs are typically observed in the San Marcial reach, the Rio Grande River was within 40 m of the WIFL territories, and the soils were moist. SV-03 extends north and south 3 km along the western bank of the Rio Grande river (UTM Zone 13 south, from 329,735 m easting and 3,797,168 m northing, to 330,316 m easting and 3,794,689 m northing) (Figures 4 and 9). A single male was detected on May 19. Pairing of this male was confirmed during the second survey on June 23 with the detection of a female, and a nest was found in the territory. The additional male detected at this time had paired and nested by the third survey period on July 3. A third pair was confirmed, though no nests associated with this pair were found during the final survey on July 13.

Figure 11. San Marcial reach WIFL summary from 1994-2001 .

SV-04 is located within the Sevilleta NWR/La Joya State Wildlife Area reach, extending north and south along the western bank of the Rio Grande River 1.5 km, immediately south of SV-03 (UTM Zone 13 south, from 330,399 m easting and 3,794,655 m northing, to 329,224 m easting and 3,794,068 m northing) (Figures 4 and 9). This site was surveyed five times during the 2001 season. No WIFLs were detected during the initial survey on May 18. On June 22, a WIFL pair was found in the site. A third survey on June 29 confirmed this pair, although a nest was not located. During the fourth and fifth surveys, on July 9 and July 16 respectively, the WIFL pair was no longer detected. Nesting was not confirmed at this site.

SV-09 is located in the Sevilleta NWR /La Joya State Wildlife Area reach, extending north and south 3.2 km along the western bank of the Rio Grande River (UTM Zone 13 south, from 330,803 m easting and 3,805,248 m northing to 328,843 m easting and 3,801,553 m northing) (Figures 4 and 9). This site supported seven WIFL territories during the 2001 season. This is the only surveyed site during the 2001 season where additional southwestern willow flycatchers (1 pair) were found in the fourth and fifth survey periods. Within the seven territories, six pairs were established, of which nesting was confirmed at five.

LFCC-5A is located to the west of the LFCC approximately 3 km downstream of the San Marcial Bridge. It is bordered on the east by the LFCC and spans a distance of 2.5 km from north to south (UTM Zone 13 south, from 314,472 m easting and 3,725,761 m northing to 313,755 m easting and 3,723,503 m northing) (Figures 3 and 10). LFCC-5A is dominated by young salt cedar and has many open patches. The soil was very dry over most of the site, with the exception of the NE corner which had moist soil and ponded water. This site was surveyed five times during the 2001 season. A single male was detected in the NE corner during the first survey on May 31. No WIFLs were detected on June 14, June 29, July 12, or July 20, thus the male was determined to be a migrant.

LF-11 is located in the San Marcial reach of the Rio Grande to the north and east of Fort Craig (UTM Zone 13 south, from 315,264 m easting and 3,724,372 m northing to 314,599 m easting and 3,723,057 m northing) (Figures 3 and 10). The site is situated between the western bank of the Rio Grande and the LFCC levee, and was surveyed five times during the 2001 season. On May 18, one male was detected and was later determined to be a migrant. No WIFLs were found during the second survey on June 5. A pair was detected on June 21, and was in the process of building a nest. The pair remained present through the fourth and fifth surveys, on July 9 and July 17 respectively.

LF-17 is located in the headwaters of Elephant Butte Reservoir, to the west of the LFCC (UTM Zone 13 south, from 309,459 m easting and 3,718,537 m northing, to 308,401 m easting and 3,717,264 m northing) (Figures 3 and 10). Flowing water and (or) moist soil was present throughout much of this site. Five surveys were conducted during the 2001 season. A total of 30 WIFLs (15 %, 15 &) formed 15 nesting pairs and produced 26 nests (including

nine second broods and two re-nests).

LF-17A is located immediately north of LF-17 (UTM Zone 13 south, from 309,547 m easting and 3,718,480 m northing, to 308,365 m easting and 3,717,309 m northing) (Figures 3 and 10). This site is dominated by cattails *(Typha* sp.) and contains small islands of suitable cottonwood/willow stands supported by ponded water or minimal flows of small, braided streams. Five surveys were conducted during the 2001 season. A total of 14 WIFLs (7 %, 7 &) formed 6 nesting pairs and produced 9 nests (including 1 second brood and 2 re-nests).

LF-27 extends from the railroad bridge near the northern boundary of Elephant Butte public lands, south along the eastern bank for approximately 2.4 km (UTM Zone 13 south, from 315,226 m easting and 3,728,242 m northing, to 314,914 m easting and 3,725,922 m northing) (Figures 3 and 10). Five surveys were conducted during the 2001 season. On May 24, four males were detected in the northern portion of the site. During the second survey, on June 7, two males were detected. These males were very quiet and were assumed to be paired with females, though pairing was not confirmed. These birds were still present by the third survey on June 25, but were absent on July 10 and July 19. Nesting was not confirmed at this site.

LF-29 extends approximately 1.7 km along the eastern bank of the Rio Grande (UTM Zone 13 south, from 315,650 m easting and 3,723,997 northing, to 314,554 m easting and 3,722,630 m northing) (Figures 3 and 10). Due to overbank flooding in May and June, ponded water and moist soil persisted throughout the site during all five surveys in 2001. On May 22, three males were detected in this site. No WIFLs were detected on June 6, June 29, July 10, or July 19, thus the three males detected during the first survey were considered to be migrants.

LF-30 is located immediately south of LF-29, extending approximately 1.7 km along the eastern bank of the Rio Grande (UTM Zone 13 south, from 314,554 m easting and 3,722,630 m northing, to 313,713 m easting and 3,721,138 m northing) (Figures 3 and 10). Overbank flooding in May and June affected the northern portion of this site, leaving ponded water and moist soil in this area throughout the season. This site was surveyed five times in 2001. On May 22, a lone female was found whitting in the northern portion of the site. No WIFLs were detected on June 11, June 28, July 9, or July 17, thus the female was considered to be a migrant.

Species of Special Concern

An asserted effort to record the presence of other neotropical migrants of special concern (i.e., yellow warbler, yellow-billed cuckoo, Bell•s vireo, summer tanager, and common ground-dove) was also conducted. Every effort was made to avoid duplicate recording of these individuals.

No common ground-doves were detected during the 2000 or 2001 seasons. Results for the San Marcial reach (railroad trestle to Elephant Butte Reservoir delta) are presented in Figure 12, and results for the Sevilleta NWR/ LaJoya State Wildlife Area and San Acacia Dam to Escondida Bridge reaches are shown in Figure13.

Nest Searches/Monitoring

Miscellaneous Sites ● No nests were found in the Velarde sites or in the Bosque Channel Widening site during the 2001 WIFL breeding season.

Sevilleta NWR/La Joya State Wildlife Area ● WIFLs were first discovered within this reach during the 1999 WIFL breeding season. Unlike the native dominated habitats which supported all other WIFL territories, this reach is dominated by saltcedar (70 percent), and Russian olive (30 percent), with a minor native coyote willow component in sites SV-04 and SV-09. This reach supported 11 territories and 10 WIFL pairs during the 2001 season. Although only 8 nests were discovered, the presence of fledglings in a territory in SV-03 confirmed the presence of another nest, bringing the total to nine nests for this reach. Six nests were successful, two failed, and the outcome of one is unknown. Two re-nests and no second broods were documented within this reach. Approximately 11 young are believed to have successfully fledged from these nest. Although five of the nine nesting attempts were parasitized, only one resulted in direct nest failure: 1) nest fledged a BHCO and 2 WIFL chicks; 2) nest fledged a single BHCO chick; 3) nest parasitized with two BHCO eggs and latter predated; 4) nest parasitized, but BHCO egg didn't hatch and 2 WIFL chicks successfully fledged; and 5) nest parasitized, but BHCO chick was removed and nest successfully fledged 2 WIFL chicks. The following is a complete summary of nest monitoring efforts for each of the nine nests which were found (Table 4).

SV-03 - There were a total of three nests discovered in this site during the 2001 breeding season. The presence of one additional nest was confirmed in a territory (though this nest was not found) when fledglings were observed. Three nests (including one re-nest) were assumed to be successful, and one nest failed. Approximately six young were assumed to have fledged from this site. The earliest estimated hatch date was June 15, and the latest estimated fledge date was August 11. The renest attempt resulted in the fledging of a BHCO chick, and two WIFLs.

SV-09 - There were a total of five nests discovered at this site during the 2001 breeding season, including one re-nest. Three nests were assumed successful, one nest failed, and the outcome of one is unknown. Approximately five young were assumed to have fledged from this site. The earliest estimated hatch date was July 1, and the latest estimated fledge date was August 21.

Figure 12. Species of special concern within the San Marcial reach (railroad trestle to Elephant Butte Reservoir).

Figure 13. Species of special concern within the Sevilleta NWR/LaJoya State Wildlife Area and San

Acacia Diversion Dam to Escondida Bridge reaches.

Table 4. Nest monitoring results for the Sevilleta NWR

Nest site or territory	Initial nest detection	Nest observation and probable outcome	Estimated hatching (H) and fledgling (F) dates
SV-03, Nest 1	6/21	6/21 - 1 WIFL egg, 1 BHCO egg present 6/25 - 1 WIFL egg, 1 BHCO egg present 6/29 - 0 WIFL eggs (though no sign of predation), 1 BHCO egg present 7/3 - 1 BHCO nestling, ~2 days old 7/7 - 1 BHCO nestling, ~7 days old ***Nest unsuccessful, assume WIFL egg predated. 1 BHCO chick fledged.***	H: ~7/1 (BHCO) F: ~7/11 (BHCO)
SV-03, Nest 1A	7/13	7/13 - 3 WIFL eggs, 1 BHCO egg present 7/23 - 3 WIFL eggs, 1 BHCO egg present 7/26 - 3 WIFL eggs, 1 BHCO egg present 7/31 - 3 WIFL nestlings, 1 BHCO nestling present, all ~3 days old 8/7 - 2 WIFL nestlings, 1 BHCO nestling present, all ~10 days old 8/9 - 2 WIFL nestlings, 1 BHCO nestling present, all ~12 days old ***Nest assumed successful. 2 WIFL chicks and 1 BHCO chick fledged.***	H: ~7/29 (WIFL & BHCO) F: ~8/9 (WIFL & BHCO)
SV-03, Nest 2*	6/29	6/29 - 2 fledglings seen in territory. *Actual nest was not located	H: ~6/15 F: ~6/27
SV-03, Nest 3	7/23	7/23 - 2 WIFL nestlings, ~8 days old 7/27 - 2 WIFL nestlings, ~12 days old 7/31 - 0 WIFL nestlings, 1 BHCO egg (BHCO egg didn't hatch) ***Nest assumed successful, 2 WIFL chicks fledged.***	H: ~7/16 F: ~7/27
SV-09, Nest 1	6/24	6/24 - 2 WIFL eggs present 7/3 - 2 WIFL nestlings, ~2 days old 7/11 - 1-2 WIFL nestlings, ~11 days old ***Nest assumed successful, 2 WIFL chicks fledged.***	H: ~7/1 F: ~7/12
SV-09, Nest 2	6/24	6/24 - 2 BHCO eggs present 7/7 - Nest predated, and only partially remains. No sign of egg shells or nestlings nearby ***Nest unsuccessful, predated.***	H: N/A F: N/A
SV-09, Nest 2A	7/27	7/27 - 1 WIFL nestling (?), ~8 days old. ***Nest assumed successful, possibly 1 WIFL chick fledged.***	H: ~7/20 F: ~7/31
SV-09, Nest 3	6/24	6/24 - Nest empty	H: ~7/14 (WIFL)

		7/8 - 3 WIFL eggs, 1 BHCO egg present 7/12 - 3 WIFL eggs, 1 BHCO nestling ~1 day old - BHCO chick removed 7/13 - 2 WIFL eggs, 1 WIFL nestling ~ 1 day old, 0 BHCO nestlings 7/23 - 2 WIFL nestlings, ~10 days old 7/27 - 2 WIFL fledglings, ~14 days old observed around nest ***Nest successful, 2 WIFL chicks fledged.***	F: ~7/25 (WIFL) H: 7/12 (BHCO) F: N/A
SV-09, Nest 4	7/26	7/26 - Nest empty 7/31 - 2 WIFL eggs present 8/7 - 2 WIFL eggs present 8/9 - 2 WIFL eggs present ***Outcome unknown, nest not monitored beyond incubation. Hatching and fledging dates estimated***.	H: 8/10 F: 8/21

San Marcial reach [railroad bridge to Elephant Butte Reservoir delta]●The results of nest monitoring are summarized in Table 5. A total of 36 nests were found in this reach ●27 of these were assumed to be successful, and 9 were known to have failed. Approximately 79 young are assumed to have fledged from the San Marcial reach. The following is a summary of nest monitoring efforts for each of the 36 nests found in the San Marcial reach during the 2001 WIFL breeding season.

LF-11 - A single nest was located within this site during the 2001 breeding season. The nest was successful and assumed to have fledged 3 WIFLs. The estimated hatch date for the nest was July 18, and the estimated fledge date was July 30.

LF-17 - This site supported 26 nests during the 2001 breeding season. Six of these nests failed. Twenty nests were assumed to have successfully fledged approximately 59 chicks. The earliest hatching date was around June 12, and the latest fledging date was assumed to be around August 19.

LF-17A - Nine nests were found at this site during the 2001 WIFL breeding season. Three of these nests failed. Six nests were assumed to have successfully fledged approximately 17 young. The earliest hatching date was around June 19, and the latest fledging date was assumed to be around August 14.

Table 5. Nest monitoring results for the San Marcial reach of the Rio Grande

Nest site or territory	Initial nest detection	Nest observation and probable outcome	Estimated hatching (H) and fledgling (F) dates
LF-11, Nest 1	6/22	6/22 - Nest empty 7/1 - Nest empty 7/7 - 3 WIFL eggs present 7/15 - 3 WIFL eggs present 7/17 - 3 WIFL eggs present 7/21 - 3 WIFL nestlings, ~3 days old 7/29 - 3 WIFL nestlings, ~11 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: 7/18 F: ~7/30
LF-17, Nest 1	5/30	5/30 - 1 WIFL egg present 6/10 - 4 WIFL eggs present 6/19 - 4 WIFL nestlings, ~4 days old 6/26 - 2 WIFL nestlings visible, ~11 days old (assume 4 nestlings total) ***Nest assumed successful, 4 WIFL chicks fledged.***	H: ~6/14 F: ~6/27
LF-17, Nest 2	5/30	5/30 - Nest empty 6/10 - 4 WIFL eggs present 6/19 - 4 WIFL nestlings, ~3 days old 6/26 - Nest predated and damaged, no nestlings present ***Nest unsuccessful, predated.***	H: ~6/15 F: N/A
LF-17, Nest 3	5/31	5/31 - Nest empty 6/6 - 2 WIFL eggs present 6/19 - 4 WIFL eggs present 6/26 - 4 WIFL nestlings, ~2 days old 7/7 - Nest empty, assume 4 fledged ***Nest assumed successful, 4 WIFL chicks fledged.***	H: ~6/24 F: ~7/5
LF-17, Nest 4	5/31	5/31 - Nest empty 6/6 - 2 WIFL eggs present 6/19 - 4 WIFL eggs present 6/24 - $\geq$2 WIFL nestlings, 2-4 days old 7/1 - Nest empty ***Nest assumed successful, at least 2 WIFL chicks fledged.***	H: ~6/20 F: ~7/1
LF-17, Nest 5	6/6	6/6 - 3 WIFL eggs present 6/19 - Unable to locate flagging 6/22 - 1 WIFL egg, 1 WIFL nestling 2-3 days old 7/1 - 1 WIFL fledgling ~12 days old confirmed around nest ***Nest successful, assume 2 WIFL***	H: 6/19 - 6/20 F: ~7/1

Nest site or territory	Initial nest detection	Nest observation and probable outcome	Estimated hatching (H) and fledgling (F) dates
		chicks fledged.	
LF-17, Nest 6	6/7	6/7 - 3 WIFL eggs present 6/19 - 4 WIFL eggs present 6/24 - 4 WIFL nestlings, 3-4 days old 7/1 - Nest missing, possibly predated ***Nest unsuccessful, assume predated.***	H: ~6/20 F: N/A
LF-17, Nest 7	6/7	6/7 - 4 WIFL eggs present 6/19 - 4 WIFL nestlings, 3-4 days old 6/26 - 2 WIFL nestlings visible, ~11 days old ***Nest assumed successful, 4 WIFL chicks fledged.***	H: 6/15 - 6/16 F: ~6/26
LF-17, Nest 8	6/7	6/7 - 4 WIFL eggs present 6/19 - 3 WIFL nestlings, 4-5 days old 6/24 - 1 dead WIFL chick in nest, 9-10 days old. No other nestlings seen ***Nest unsuccessful, no clear sign of predation.***	H: 6/14 - 6/15 F: N/A
LF-17, Nest 9	6/7	6/7 - 3 WIFL eggs 6/19 - 2 WIFL nestlings, 6-7 days old 6/24 - 2 WIFL nestlings, 11-12 days old ***Nest assumed successful, 2 WIFL chicks fledged.***	H: 6/12 - 6/13 F: 6/24 - 6/25
LF-17, Nest 10	6/15	6/15 - Nest empty 6/19 - Nest empty 6/24 - 3 WIFL eggs present 7/7 - 1 WIFL egg, 2 WIFL nestlings, <1 day old 7/15 - 2-3 WIFL nestlings, 6-7 days old 7/20 - 3 WIFL nestlings, 11-12 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: 7/7 F: ~7/21
LF-17, Nest 11	6/19	6/19 - 3 WIFL nestlings, ~6 days old 6/24 - 2 WIFL nestlings, ~11 days old - 1 WIFL fledgling seen leaving nest ***Nest successful, 3 WIFL chicks fledged.***	H: ~6/13 F: ~6/24
LF-17, Nest 12	6/19	6/19 - 3 WIFL eggs present 6/24 - 3 WIFL eggs present 7/1 - 3 WIFL nestlings, ~1 day old 7/12 - 3 WIFL nestlings, 11-12 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: ~ 6/30 F: 7/12 - 7/13
LF-17, Nest 13	6/19	6/19 - 4 WIFL eggs present	H: ~6/22

Nest site or territory	Initial nest detection	Nest observation and probable outcome	Estimated hatching (H) and fledgling (F) dates
		6/24 - 1 WIFL egg, 3 WIFL nestlings, ~2 days old 7/1 - 2 WIFL nestlings visible, ~9 days old ***Nest assumed successful, assume 3 WIFL chicks fledged.***	F: ~7/4
LF-17, Nest 14	6/19	6/19 - 4 WIFL eggs present 6/24 - 4 WIFL eggs present 7/2 - 4 WIFL nestlings, 2 days old 7/9 - 4 WIFL nestlings, 10-11 days old 7/12 - 3 WIFL fledglings 13-14 days old confirmed around nest ***Nest successful, 4 WIFL chicks fledged.***	H: 6/28 - 6/29 F: ~7/12
LF-17, Nest 15	7/1	7/1 - 2 WIFL eggs present 7/7 - 3 WIFL eggs present 7/15 - 2 WIFL eggs, 1 WIFL nestling ~1 day old 7/19 - 3 WIFL nestlings, 2-3 days old 7/29 - ≥2 WIFL nestlings, 11-12 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: 7/15 F: ~7/29
LF-17, Nest 16	7/7	7/7 - 3 WIFL eggs present 7/15 - 3 WIFL nestlings, 2-3 days old 7/20 - 3 WIFL nestlings, 7-8 days old 7/22 - 3 WIFL nestlings, ~10 days old 7/26 - 3 fledglings ~14 days old seen within 1m of nest ***Nest successful, 3 WIFL chicks fledged.***	H: ~7/12 F: 7/26
LF-17, Nest 17	7/9	7/9 - Nest empty 7/12 - 2 WIFL eggs present 7/19 - 3 WIFL eggs present 7/27 - 3 WIFL nestlings, 3 days old 7/29 - 3 nestlings, 5 days old 8/5 - 3 nestlings, ~12 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: 7/25 F: ~8/5
LF-17, Nest 18	7/9	7/9 - 3 WIFL eggs present 7/12 - 3 WIFL eggs present 7/19 - 3 WIFL eggs present 7/22 - 3 WIFL nestlings, ~3 days old 7/29 - ≥2 nestlings, 9-10 days old 8/1 - 2 nestlings visible, ~12 days old ***Nest assumed successful, 2-3 WIFL chicks fledged.***	H: 7/21 F: ~8/1
LF-17, Nest 19	7/12	7/12 - 4 WIFL eggs present 7/19 - ≥3 WIFL nestlings, ~3 days old	H: 7/17 F: ~7/28

Nest site or territory	Initial nest detection	Nest observation and probable outcome	Estimated hatching (H) and fledgling (F) dates
		7/27 - ≥2 nestlings, ~11 days old. One chick may have already fledged 7/29 - Nest empty, 1 fledgling associated with nest ***Nest successful, 3-4 WIFL chicks fledged.***	
LF-17, Nest 20	7/12	7/12 - 4 WIFL eggs present 7/19 - 3-4 WIFL nestlings, ~3 days old 7/27 - ≥3 nestlings, ~10 days old 7/29 - ≥2 nestlings, ~12 days old ***Nest assumed successful, at least 3 WIFL chicks fledged.***	H: ~7/18 F: ~7/29
LF-17, Nest 21	7/12	7/12 - 3 WIFL eggs present 7/19 - 3 WIFL nestlings, ~3 days old 7/27 - Nest gone, raccoon tracks at base of nest tree ***Nest unsuccessful, assume predated.***	H: ~7/17 F: N/A
LF-17, Nest 22	7/12	7/12 - 3 WIFL eggs present 7/19 - 3 WIFL eggs present 7/27 - 3 nestlings, 2-3 days old 7/29 - 3 nestlings, 6 days old 8/5 - 3 nestlings, 12-13 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: 7/22 F: ~8/5
LF-17, Nest 23	7/12	7/12 - 2 WIFL eggs present 7/19 - 1 WIFL egg, 1 nestling, ~1 day old 7/27 - 1 WIFL egg, but nestling missing. Appears to be predated ***Nest unsuccessful, assume predated.***	H: ~7/19 F: N/A
LF-17, Nest 24	7/25	7/25 - 2 WIFL eggs present 7/27 - 2 WIFL eggs present 7/29 - 2 WIFL eggs present 8/5 - 2 WIFL eggs, no adult interaction 8/9 - still 2 eggs, appears abandoned ***Nest unsuccessful, assume abandoned.***	H: N/A F: N/A
LF-17, Nest 25	7/25	7/25 - 2 WIFL eggs present 7/27 - 2 WIFL eggs present 7/29 - 2 WIFL eggs present 8/5 - 2 WIFL eggs present 8/9 - 2 nestlings, ~2 days old. Nest not monitored further ***Nest may have fledged 2 WIFL chicks, though nest success was not confirmed.***	H: ~8/8 F: ~8/19
LF-17, Nest 26	7/26	7/26 - 2-3 WIFL nestlings, ~2 days old 7/29 - 3 nestlings, 5 days old	H: 7/25 - 7/26 F: ~8/5

Nest site or territory	Initial nest detection	Nest observation and probable outcome	Estimated hatching (H) and fledgling (F) dates
		8/5 - 3 nestlings, 11-12 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	
LF-17A, Nest 1	6/10	6/10 - 4 WIFL eggs present 6/20 - 4 nestlings, 2 days old 7/1 - 3 nestlings, 1 fledgling observed, all 12-13 days old ***Nest successful, 4 WIFL chicks fledged.***	H: 6/19 - 6/20 F: 7/1 - 7/2
LF-17A, Nest 2	6/10	6/10 - 4 WIFL eggs present 6/20 - Nest empty, probably predated although nest was intact ***Nest unsuccessful, assume predated.***	H: N/A F: N/A
LF-17A, Nest 2A	7/7	7/7 - 3 WIFL eggs present 7/12 - 3 nestlings, 2-3 days old 7/20 - 3 nestlings, 10-11 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: 7/10 - 7/11 F: 7/21 - 7/22
LF-17A, Nest 3	6/10	6/10 - 1 WIFL egg present 6/20 - 3 WIFL eggs present 6/24 - 3 WIFL eggs present 6/26 - 1 egg, 2 nestlings, 1-2 days old 7/7 - ≥1 nestling, 12 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: 6/24 - 6/25 F: 7/5 - 7/7
LF-17A, Nest 4	6/10	6/10 - Nest was still being built 6/20 - 3 WIFL eggs present 6/26 - 3 WIFL eggs present 7/7 - 3 nestlings, ~5 days old 7/12 - 3 nestlings, 7-8 days old 7/15 - 3 nestlings, ~13 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: ~7/3 F: 7/14 - 7/15
LF-17A, Nest 5	6/24	6/24 - 3 WIFL eggs present 6/26 - 3 WIFL eggs present 7/1 - 3 WIFL eggs present 7/7 - 3 nestlings, ~4 days old 7/12 - ≥2 nestlings, 9-10 days old 7/15 - 2 nestlings, ~13 days old ***Nest assumed successful, 3 WIFL chicks fledged.***	H: ~7/3 F: 7/15
LF-17A, Nest 6	7/7	7/7 - 4 WIFL nestlings, ~2 days old 7/12 - Nest empty, no sign of nestlings ***Nest unsuccessful, assume predated.***	H: ~7/6 F: N/A
LF-17A, Nest 7	7/12	7/12 - Nest empty	H: ~8/3

Nest site or territory	Initial nest detection	Nest observation and probable outcome	Estimated hatching (H) and fledgling (F) dates
		7/20 - 3 WIFL eggs present 7/29 - 3 WIFL eggs present 8/5 - 2 eggs, 1 nestling 3-4 days old 8/9 - 2 eggs, 1 nestling 7 days old ***Nest assumed successful, 1 WIFL chick fledged.***	F: ~8/14
LF-17A, Nest 8	7/12	7/12 - Nest empty 7/20 - Nest empty 7/25 - Nest empty ***N est unsuccessful, abandoned prior to egg-laying***	H: N/A F: N/A

WIFL Habitat Suitability Model

A GIS database and ArcView analytic capabilities were used to predict habitat potential for WIFLs in the San Acacia Diversion Dam to Elephant Butte Reservoir reach of the Middle Rio Grande. For this analysis, riparian vegetation types were placed in habitat categories representing different levels of suitability based on locations of known territories, proximity to water, plant species composition, vegetation density, and height. With the exception of low suitability habitats, all remaining suitability categories were required to meet the hydrologic parameter of < 100 m of surface water.

For purposes of model output display, this reach was divided into six study areas with similar hydrologic characteristics (Figure 14). The study areas are:

- Sevilleta NWR/LaJoya State Wildlife Area to San Acacia Diversion Dam
- Upper reach north - Northern boundary north of Bosque del Apache NWR to San Acacia Diversion Dam
- Upper reach south - Northern boundary of Bosque del Apache NWR to the railroad bridge
- Lower reach eastside - East of the LFCC from the railroad bridge to Elephant Butte Reservoir
- Lower reach westside - West of the LFCC from the railroad bridge to Elephant Butte Reservoir
- Elephant Butte Reservoir delta - Includes the recently exposed delta of Elephant Butte Reservoir.

Table 6 summarizes the extent of suitable and potential habitat in the six identified areas. A total

of 24,949 ha of riparian vegetation has been identified in the project area (Highway 60 bridge to Elephant Butte Reservoir). An additional 3,708 ha of wetlands and open water have also been identified. Figures 15, 16, 17 and 18 illustrate the extent of WIFL habitat suitability within the respective survey sites from the Highway 60 bridge to the headwaters of Elephant Butte Reservoir. [The respective sites and percentages of the various habitat suitability categories are summarized in Appendix C.] Of the total, approximately 2,051 ha (8.2 percent) were identified in the project area to be highly suitable or suitable breeding habitat. In addition, about 1,995 ha (7.9 percent) of dense saltcedar has been classified as marginally suitable. About 1,812 ha (7.3 percent) has been classified as potential habitat composed of sparse stands of riparian vegetation, usually on river bars along high flow channels, that could develop into suitable habitat with additional growth of current seedlings, and/or recruitment of native riparian plants. Some of the stands of very young growth (structure type 6) identified from 1995 areal photos had developed into highly suitable habitat by the summer of 1999. Low suitability areas for breeding WIFLs accounted for the remaining 19,091 ha (76.6 percent) of riparian vegetation. The total hectares of WIFL habitat categories have changed since 1998 due to continued refinement of the WIFL habitat suitability model and availability of current hydrology and vegetation classification data.

A large percentage of the highly suitable habitat is concentrated along the existing river channel downstream of Bosque del Apache NWR where recent sediment deposition has occurred. The reaches downstream of the Bosque del Apache NWR to the delta of Elephant Butte Reservoir support about 581 ha of highly suitable habitat or about 71 percent of the highly suitable habitat in the project area. About 255 ha of highly suitable habitat occur downstream of the railroad bridge along the existing river channel to the delta which represents about 31 percent of the total highly suitable habitat. An additional 65 ha of highly suitable habitat have recently developed in the delta as the reservoir pool has been lowering.

Figure 14. Six study areas between Highway 60 and Elephant Butte Reservoir evaluated using the WIFL habitat suitability model.

Figure 15. WIFL habitat suitability map (1 of 4).

Figure 16. WIFL habitat suitability map (2 of 4)

Figure 17. WIFL habitat suitability map (3 of 4).

Figure 18. WIFL habitat suitability map (4 of 4).

Table 6. Total hectares of WIFL habitat categories on the Rio Grande between the Highway 60 bridge and the head of Elephant Butte Reservoir.

WIFL habitat category		Hectares per reach					
	Sevilleta/ LaJoya	Upper north	Upper south*	Lower east	Lower west	Delta	Total
Highly suitable native riparian	217	19	184	255	77	65	817
Suitable mixed native/exotic riparian	757	85	192	119	35	46	1,234
Marginally suitable exotic riparian	898	169	729	59	134	6	1,995
Potential with future riparian vegetation growth and development	1,081	426	183	50	35	37	1,812
Low suitability	11,204	2,264	2,372	133	1,440	1,678	19,091
TOTAL	14,157	2,963	3,660	616	1,721	1,832	24,949

*includes Tiffany area

Generally, areas of suitable breeding habitat are a result of the recent sediment deposition and the subsequent establishment and growth of willow-dominated vegetation. Figure 19 illustrates the relationship between the distribution of sediment deposition (aggregation) and the extent of suitable habitat.

Numerous factors affect the river basin=s potential for sediment deposition (e.g., width of active flood plain, river gradient, soil types, overbank flood events, etc.). Overbank flooding ansediment deposition is essential for the establishment of cottonwood and willow. The river segment from San Acacia Diversion Dam to Escondida Bridge was mapped showing 2- to 3-foot contour intervals and associated riverflows (cfs) needed to achieve overbank flooding (Figure 20). With a 5,000-cfs flow, only 6.6 percent of the active flood plain would experience overbank flooding. Greater than 50,000cfs would be required to achieve overbank flooding at some locations within this river segment.

The change in sediment volume, and abundance of suitable WIFL habitat shown in Figure 19 compliments the data shown in both Figures 16 and 20. Figure 19 illustrates that the river channel in this 18 km segment (Figure 20) has actually degraded, forming the terraces. The degredation of the river channel, and subsequently the erosion of sediments has not been conducive to the establishment of suitable WIFL habitat.

Figure 19. Relation of highly suitable habitat and aggradation/degradation along the Rio Grande from San Acacia Diversion Dam to Elephant Butte Reservoir.

Figure 20. Rio Grande riverflows required to achieve overbank flooding at various terrace heights.

Based on the WIFL habitat model (Figure 16), this segment is shown to possess some areas of potential habitat with future growth and development. However, based on the hydrologic regime shown in Figure 20, future growth and development, and the establishment of cottonwood and willow, is limited by the lack of overbank flood events. Only low-lying terraces that have experienced overbank flooding and sediment deposition at lower river flows support the limited suitable WIFL habitat in this river segment.

DISCUSSION AND RECOMMENDATIONS

Presence/Absence Surveys

WIFL territories in the Velarde area of northern New Mexico, which include the La Canova, Garcia Acequia, and La Rinconada sites, have declined in recent years. In 1995, six territories were established at these sites (nest monitoring was not conducted); in 1996, four territories were documented by the NMNHP, and two failed nesting attempts were observed (NMNHP 1996). Five territories were found in 1997, and six nesting attempts were recorded, however only one of these nesting attempts may have been successful. Two territories and three nesting attempts were recorded in 1998 one of the nesting attempts was successful, one failed, and one was unknown; in 1999 two territories and a single failed nesting attempt was observed. Two territories and two nesting attempts were recorded in 2000, both with unknown outcomes. In 2001 only one territory was established in this reach, which further confirms the declining trend in WIFL territories in the Velarde area. The lone pair at the La Canova site likely nested, however no nest was found. While localized populations within the Sevilleta NWR/La Joya State Wildlife Area reach and San Marcial reach have increased in recent years, these small isolated sites in the Velarde area continue to decline.

The quality of vegetative habitat at these sites has not noticeably diminished in recent years, nor has the frequency and duration of overbank flood events. Actually, the density and structure of the vegetation is believed to have increased as a result of maturing stands of native coyote willow. It is likely that the frequency of failed nesting attempts in the past has greatly attributed to the apparent decline of territorial WIFLs in this area. The causes of nest failure are believed to be varied ranging from severe thunderstorms to natural predation, brood parasitism, the fragmented nature of riparian habitat, and adjacent land use practices. Presence/absence surveys and nest monitoring should continue at these sites to determine population trends and to assess nesting success to the extent that funding and available resources permit.

In the San Marcial reach, WIFL surveys and nest monitoring have not been conducted on lands north of the railroad bridge since 1996. In 1994 and 1995, the area immediately upstream from the railroad bridge supported 5 to 11 WIFL territories 5 to 7 of these territories contained WIFL pairs in an area referred to as the Condo site (NMNHP 1994, NMNHP 1996). Although surveys were conducted downstream from the railroad bridge to the delta of Elephant Butte Reservoir in 1994 and 1995, only three unpaired males were detected during the 1995 breeding season

(Ahlers and White 1995), and none were detected during the 1994 breeding season (NMNHP 1994). Since 1995, WIFL territories and nests below the railroad bridge have increased (Table 7). Thirteen WIFL territories were identified in 1996, 10 in 1997, 11 in 1998, 12 in 1999, 23 in 2000, and 25 in 2001. Confirmed pairing and nesting have also increased downstream of the railroad bridge since 1994. The WIFL territories below the railroad bridge were dispersed over a larger area than those at the Condo site above the railroad bridge. WIFLs below the bridge were found in four general locations in 2001, while the Condo site represents a single location. However, concentrations in LF-17A and LF-17 are very similar and may represent some of the best quality WIFL habitat in the San Marcial Reach. A total of 21 nesting pairs were established at these two sites during the 2001 season. WIFLs below the railroad bridge and not in association with these two sites may be more dispersed due to the extensive availability of suitable habitat. It is anticipated that as more suitable habitat becomes occupied through immigration or reproductive recruitment, an increase in the local WIFL population will result.

Table 7. Summary of southwestern willow flycatcher nest monitoring (1994-2001) - downstream of railroad bridge to Elephant Butte Reservoir delta.

Year	# Territories	# Pairs	# Nests found **	# Nests parasitized (%)	# Nests predated (%)	# Nests abandoned (%)	Unknown success	# Successful nests (%)	Estimated total # chicks fledged	Estimated productivity (# chicks per successful nest)
1994	0	0	0	N/A	N/A	N/A	N/A	N/A	0	N/A
1995	3	0	0	N/A	N/A	N/A	N/A	N/A	0	N/A
1996	13	1	1	0	0	1 (100%)	N/A	0	0	N/A
1997	10	3	2	0	0	0	0	2 (100%)	4	2.0
1998	11	4	2	0	0	0	0	2 (100%)	7	3.5
1999	12	5	5	1 (20%)*	1 (20%)*	1 (20%)*	0	4 (80%)	10	2.5
2000	23	20	19	2 (10%)*	1 (5%)	2 (10%)*	2	14 (74%)	29	2.1
2001	25	25	36	0	7 (19%)	2 (6%)	0	27 (75%)	79	2.9

**some nests were parasitized, predated, and/or subsequently abandoned*
*** some pairs renested after failed attempt or attempted a second brood*

Cattle were removed from public lands below the railroad bridge during the WIFL breeding season from 1997 through 2001. The removal of cattle during the WIFL breeding season was initiated in an effort to reduce the potential for brood parasitism by brown-headed cowbirds which associate with cattle, and to limit physical disturbance to the occupied WIFL sites. Of the 64 WIFL nests found below the railroad bridge since 1997, only 3 WIFL nests have been parasitized (5 percent). In contrast, four of six nests were confirmed to have been parasitized in 1995 at the Condo site when cattle were present in the vicinity (66 percent) Although there has been an apparent decrease in the percentage of WIFL nests that have been parasitized since 1997, it is unknown to what degree the removal of cattle from the area has been responsible for

the decline since only one year of WIFL nest monitoring had been conducted prior to the removal of cattle. Based on available data (Ahlers and Tisdale-Hein 2000), it is assumed that cattle may concentrate local BHCO populations, but may not actually increase localized BHCO populations on the Middle Rio Grande. Cowbird trapping has also been conducted within public lands below the railroad bridge since 1997. Cowbird trapping may reduce the potential for brood parasitism, however it is difficult to assess the benefits of cowbird trapping on overall nesting success since adequate WIFL nest monitoring for parasitism did not occur prior to trapping (Ahlers and Tisdale-Hein 2000, Ahlers and Sechrist 2001). Surveys within the San Marcial reach of Elephant Butte public lands should be continued in an effort to identify the distribution of new WIFL territories, establish population trends, nest success, and to determine the effectiveness of the cowbird trapping program. Areas which support potentially suitable habitat with future development or higher, and may be subject to direct impacts resulting from project-related activities or changes in management, should be identified and be the focus of future survey efforts. This information is critical in avoiding adverse impacts from any project related activities in the San Marcial reach, and in developing sound, cost effective resource management programs.

The Sevilleta NWR/La Joya State Wildlife Area reach was surveyed for the first time during the 2000 season. A small portion of the reach was surveyed in 1999, and four WIFL territories were found---three contained nests. Eight territories and six confirmed nesting attempts were documented within the entire Sevilleta NWR/La Joya State Wildlife Area reach during the 2000 season. In 2001 only those sites which supported WIFLs during the 2000 season were surveyed. These sites supported eleven territories in 2001, and nine nesting attempts were documented. This reach is dominated by saltcedar and Russian olive. Although Reclamation has conducted extensive surveys within stands dominated by exotic vegetation, this is the only documented occurrence of territory establishment and successful breeding in areas dominated by saltcedar and Russian olive within our study sites.. However, it is important to note that small patches of coyote willow were interspersed in the understory at four of the nine nest sites. The remaining five nest sites were dominated by exotic vegetation. [During the 2000 season a territorial male was found in a site dominated by saltcedar within the San Marcial reach, however pairing was not suspected. This individual was not found during the 2001 season.] The Sevilleta NWR/La Joya State Wildlife Area reach is not subject to overbank flooding, although moist soils were present at all territories. Presence/absence surveys and nest monitoring should continue within this reach to determine population trends, and nesting success, to the extent that funding and resources permit. These data will also aid resource managers by avoiding potential impacts to occupied WIFL habitat.

In addition to the sites identified above, any public sites within the Middle Rio Grande where suitable habitat has become established should be surveyed through a cooperative effort with other State and Federal agencies and private organizations which have a vested interest in the recovery of this species. Any private lands where permission is granted that support suitable habitat should be identified and surveyed through a cooperative effort with the landowner and the respective State or Federal agency or private organization.

Presence/absence data will be beneficial when establishing a realistic long-term monitoring plan and will aid in a better understanding of the species distribution, abundance, and potential threats. All available data will prove beneficial in the development of the Southwestern Willow Flycatcher Recovery Plan. As defined by the Draft Recovery Plan for the Southwestern Willow Flycatcher (USFWS 2001) the Middle Rio Grande extends from Cochiti Reservoir to Elephant Butte Dam. The recovery goal for this reach is 100 WIFL territories. Approximately 60 WIFL territories are currently established in this reach, including: 14 WIFL territories at the Isleta Pueblo (based on 2000 survey results) (Ahlers et. al. 2001); 11 territories within the Sevilleta NWR/La Joya State Wildlife Area reach; an estimated 8-10 territories on private lands from the south boundary of the Bosque del Apache Refuge to the railroad bridge; and 25 territories from the railroad bridge to Elephant Butte Reservoir.

Reclamation has funded presence/absence surveys since 1995, many were in association with river maintenance and riparian restoration projects. However, several of the surveys were conducted for the sole purpose of providing an increased understanding of the distribution and abundance of WIFLs in the Middle Rio Grande. Presence/absence surveys and nest monitoring should be continued following Reclamation=s obligation to conduct these studies. An agreement between the USFWS and Reclamation should be developed to (1) ensure identified WIFL sites continue to be monitored after Reclamation has achieved compliance with any project related activities, and (2) recognize Reclamation=s pro-active expenditure of funds in support of WIFL research beyond the scope of specific project activities and associated compliance.

The value of documenting the occurrence of neotropical migrants of special concern should be assessed on an annual basis. If this information continues to be of value to resource managers, the occurrence of these species should be documented concurrent with the absence/presence surveys for the WIFL.

Nest Searches/Monitoring

Velarde Area. Only one territory was found in the Velarde area in 2001. Although no nest was located, it is likely that nesting was attempted by this pair based on vocalizations and behavior. The success or failure of the suspected nest is unknown. Nest searches and monitoring should continue in conjunction with all presence/absence surveys conducted in the Velarde area. When possible, nest monitoring efforts should focus on determining the direct cause of nest failure. Nest failure at the Velarde sites is believed to be one of the leading causes of decline in this area.

San Marcial reach. During the 2001 WIFL breeding season, a total of 25 territories and 36 nests were detected. This indicates a significant increase over the past 6 years that presence/absence surveys have been conducted (Table 7). During the 2000 season, an apparent concentration of breeding WIFLs developed within the LF-17 and LF-17A sites. Fifteen territories all containing nests were found within these two sites. During the 2001 season, a total

of 22 territories were found in these sites, 21 of which contained nests.. The concentration of WIFLs at these two sites is likely a result of flooding in the immediate area. Overbank flooding at the remainder of sites below the railroad bridge was limited during the 2001 season. It is unknown why the number of territories and breeding activity has dramatically increased within the San Marcial reach during the past two seasons. It is possible that the WIFL population which has successfully fledged young, combined with low mortality over the non-breeding season, resulted in an increased number of returning individuals during the 2000 and 2001 seasons. Recruitment from other breeding populations within New Mexico or other sites throughout the southwest may also be partially responsible for the increase.

Nesting success within the San Marcial reach was relatively high. Twenty-seven of the 36 WIFL nests found were assumed to have successfully fledged young. Nine nests failed 7 due to predation and 2 due to abandonment. None of the WIFL nests monitored in this reach were parasitized by BHCOs during the 2001 season.

In 1995, four of six (66 percent, n=6) WIFL nests discovered in the riparian area upstream of the railroad bridge had been parasitized by cowbirds (NMNHP 1995). Since cowbird control efforts were initiated in 1996, only 3 of 65 nests downstream from the railroad bridge have been parasitized (5 percent, n=65). (Presence/absence surveys and nest monitoring upstream of the railroad bridge have not been conducted since 1996 due to current land ownership issues.) This is not intended to imply that the reduction in parasitism levels can solely be attributed to cowbird trapping. It is difficult to determine the pre-trapping parasitism rates due to a limited baseline sample size (n=6).

Nest monitoring should continue in conjunction with presence/absence surveys at all sites within the San Marcial reach in an effort to determine the population trend of WIFLs within the Middle Rio Grande Basin. Nest monitoring will also help to identify potential threats to the local WIFL population.

Sevilleta NWR/La Joya State Wildlife Area reach - As previously mentioned, this reach was first surveyed in its entirety during the 2000 season. A total of 11 territories and 9 nests were found within this reach in 2001. Six of the nests successfully fledged WIFL young (one nest fledged 1 BHCO, and 2 WIFL chicks), 2 failed due to predation, and the outcome of one is unknown. Nest data for other riparian obligate neotropical songbirds were not collected within this reach for comparison to WIFL nest data. However, the mean number of female cowbirds detected along established point count transects was collected and can be compared within the adjacent reaches of the Rio Grande River. Female cowbird densities during the 1999, 2000, and 2001 breeding seasons were 3 to 3.5 times greater within the Sevilleta NWR/La Joya State Wildlife Area reach than within the San Marcial reach. The Sevilleta NWR/La Joya State Wildlife Area reach supported the greatest density of female cowbirds compared to all other monitored reaches within the Middle Rio Grande Basin. As previously discussed, five of the nine WIFL nests (55 percent) found within the Sevilleta NWR/La Joya State Wildlife Area reach during the 2001 season were parasitized. Since 1999, 18 WIFL nests have been

monitored within this reach and seven have been actively parasitized (39 percent). The higher rate of parasitism (39 percent, n=18) experienced by nesting WIFLs within the Sevilleta NWR/La Joya State Wildlife Area reach (1999-2001) than within the San Marcial reach (1996-2001) (5 percent, n=65), is likely attributed to the greater density of female cowbirds. Nest monitoring of WIFL nests, in conjunction with presence/absence surveys, should continue within the Sevilleta NWR/La Joya State Wildlife Area reach to determine population trends and to identify potential threats to the local population. Nest monitoring of other riparian obligate neotropical songbirds should also be initiated in an effort to increase sample size and to determine the degree of potential parasitism associated with relatively high numbers of cowbirds.

The nest substrate of the 44 WIFL nests found within the Sevilleta NWR/La Joya State Wildlife Area reach and San Marcial reach (railroad bridge to Elephant Butte Reservoir) during the 2001 season was evaluated. Although the majority of the nests were physically located in exotic vegetation (Russian olive/saltcedar), the surrounding vegetative community was typically dominated by natives (cottonwood/willow). Four nests were found in Russian olive(9 percent); 20 in saltcedar (45 percent); 14 in Gooddings willow (32 percent); and six (14 percent) in coyote willow. However, the dominate vegetation surrounding 37 of the nest sites (84 percent)was dominated by native vegetation; exotic vegetation dominated the nest site at 4 of the locations (9 percent); and a mixed native/exotic community surrounded the remaining 3 nest sites (7 percent). These data suggest that WIFLs may key in on areas dominated by native vegetation, but prefer to select exotic vegetation, particularly saltcedar, as the nest substrate. Saltcedar may be the WIFL♠s nest substrate of choice due to its dense, vertical twig structure.

WIFL Habitat Suitability Model

The relationship of river dynamics to the establishment and maintenance of WIFL habitat must be considered in all management decisions. The river and associated riparian ecosystem should be a dynamic system with both temporal and spatial changes. Without change, the riparian community decreases in diversity, productivity, and sustainability. Scouring flows, sediment deposition, inundation, and fire are natural phenomenon that can aid in the establishment and growth of WIFL habitat. Mechanical disturbance, channel realignment, and operational flow releases from reservoirs are mechanisms that should also be considered in an effort to restore diversity to the riparian community.

The WIFL habitat suitability model should continue to be refined. Future studies are needed to evaluate additional WIFL habitat relationships: (1) At what age, structure, and species composition do recently established stands of riparian vegetation become highly suitable for WIFL breeding territories? (2) At what age, structure, and species composition do older, previously occupied stands of habitat become less suitable? and (3) What is the relationship of patch size, width, and openings to suitability? In addition, the proximity and duration of surface water/moist soil at nest sites should be documented for future suitability modeling. These questions are of paramount importance to managers working on riparian protection and

restoration.

Since willow flycatchers require dense riparian vegetation, and generally nest from 4 to 7 m above ground in mixed native/exotic habitats (Sogge et al. 1997), approximately 5 to 10 years are needed following seed germination in the Middle Rio Grande for developing suitable stands of willow for nesting. In addition, certain stands of highly suitable habitat may gradually become less suitable as the trees mature and understory vegetation thins. The number of years that vegetation remains highly suitable is unknown at this time, but probably varies depending on annual precipitation, river flows, plant species, and other factors. Most of the highly suitable riparian habitat within the San Marcial reach has developed during the past decade following periodic flooding and sediment deposition.

The current extent (hectares) of WIFL habitat was calculated from existing ArcView vegetation maps after specific vegetation types were designated as one of the four categories of habitat (highly suitable native, suitable mixed native/exotic, potential with riparian vegetation growth and development, or low suitability). The WIFL habitat suitability model was developed to serve as an assessment tool to determine relative value of habitat and assist in resource management decisions. Direct project-related impacts to various vegetation types can be determined by superimposing project features that would remove, degrade, or enhance suitable and potentially suitable habitat. Indirect impacts to suitable and potentially suitable habitat could be caused by changes in the magnitude, frequency and duration of peak riverflows, and overbank flooding in late spring and early summer. Overbank flows are important to willow flycatchers for nesting as well as in the creation of new habitat.

LITERATURE CITED

Ahlers, D. 1999. Preliminary report: browsing analysis of riparian vegetation, Elephant Butte public lands, Socorro, New Mexico, November 1997 to April 1999.

Ahlers, D. 2000. Preliminary report: browsing analysis of riparian vegetation, Elephant Butte public lands, Socorro, New Mexico, November 1999 data update. U.S. Bureau of Reclamation. Denver CO.

Ahlers, D., E. Best and J. Sechrist. 2001. 2000 Southwestern willow flycatcher study results: selected sites along the Rio Grande from Velarde, New Mexico, to the Delta of Elephant Butte Reservoir. U.S. Bureau of Reclamation. Denver CO.

Ahlers, D. and J. Sechrist. 2002. Cowbird control program, Middle Rio Grande, New Mexico, 2001. U.S. Bureau of Reclamation, Denver, CO.

Ahlers, D. and J. Sechrist. 2000. Brown-headed cowbird movement and home range analysis within the Middle Rio Grande, New Mexico - 1999. U.S. Bureau of Reclamation. Denver CO.

Ahlers, D. and R. Tisdale. 1999a. Cowbird control program, Middle Rio Grande, New Mexico, 1998. U.S. Bureau of Reclamation, Denver, CO.

Ahlers, D. and R. Tisdale. 1999b. Brown-headed cowbird movements and distribution within the Middle Rio Grande, New Mexico. U.S. Bureau of Reclamation. Denver CO.

Ahlers, D. and R. Tisdale-Hein. 2000. Preliminary assessment on the effectiveness of the cowbird control program, Middle Rio Grande, New Mexico, 1999.

Ahlers, D. and R. Tisdale-Hein. 2001. Preliminary assessment on the effectiveness of cowbird control program, Middle Rio Grande, New Mexico, 2000.

Ahlers, D. and L. White. 1995. Southwestern willow flycatcher survey results: selected sites along the Rio Grande from Velarde, New Mexico, to headwaters of Elephant Butte Reservoir.

Ahlers, D. and L. White. 1998. 1997 Southwestern willow flycatcher study results: selected sites along the Rio Grande from Velarde, New Mexico, to the headwaters of Elephant Butte Reservoir. U.S. Bureau of Reclamation. Denver CO.

Ahlers, D. and L. White. 1996. Southwestern willow flycatcher study results. Selected sites from Velarde, New Mexico, to the headwaters of Elephant Butte Reservoir and along the Pecos River from the headwaters of Lake McMillan to Avalon Dam. U.S. Bureau of Reclamation.

Browning, M. R. 1993. Comments on the taxonomy of *Empidonax traillii* (willow flycatcher). Western Birds 24:241-257.

Federal Register. 1995. Final rule determining endangered status for the southwestern willow flycatcher. Vol. 60 No.38. February 27, 1995. pp.10694-10715.

Harris, J.H., S.D. Sanders, and M.A. Flett. 1987. The status and distribution of the willow flycatcher (*Empidonax traillii*) in the Sierra Nevada. California Department of Fish and Game. Wildl. Mgmt. Div. Admin. Report 87-2.

Hink, V. C., and R. D. Ohmart. 1984. Middle Rio Grande biological survey. Army Corps of Engineers Contract No. DACW47-81-C-0015. Albuquerque, NM.

New Mexico Natural Heritage Program (NMNHP). 1994. Results of surveys for the southwestern willow flycatcher: Rio Grande floodway San Acacia to Bosque del Apache Unit, Socorro County, New Mexico. Technical report for U.S. Army Corps of Engineers, Albuquerque, New Mexico.

_____. 1995. 1995 surveys for the southwestern willow flycatcher. Technical Report for U.S. Army Corps of Engineers. Albuquerque, NM.

_____. 1996. The southwestern willow flycatcher on the Middle Rio Grande: results of 1996 surveys and nest monitoring. Technical Report for U.S. Bureau of Reclamation. Salt Lake City, UT.

Sogge, M.K. 2000. Personal communication with Darrell Ahlers.

Sogge, M. K.; R. M. Marshall; S. J. Sferra; and T. J. Tibbits. 1997. A southwestern willow flycatcher natural history summary and survey protocol. Technical Report NPS/NAUCPRS/NRTR-97/12.

Spencer, J.A., S.J. Sferra, T.E. Corman, J.W. Rourke, and M.W. Sumner. 1996. Arizona Partners in Flight 1995 southwestern willow flycatcher survey. Nongame and Endangered Wildlife Program Technical Report 97. Arizona Game and Fish Department, Phoenix, Arizona.

Stafford, M.D. and B.E. Valentine. 1985. A preliminary report on the biology of the willow flycatcher in the central Sierra Nevada. Cal-Nev. Wildl. Trans.

Tibbitts, T. J.; M. K. Sogge; and S. J. Sferra. 1994. A survey protocol for the southwestern willow flycatcher *(Empidonax traillii extimus)*. Technical Report NPS/NAUCPRS/NRTR-94/04.

Unitt, P. 1987. *Empidonax traillii extimus*: an endangered subspecies. Western Birds 18(3):137-162.

U.S. Fish and Wildlife Service (USFWS). 2000. Southwestern willow flycatcher protocol revision. USFWS Memorandum R2/ES-TE. May 31, 2000.

_____. 2001. Draft Recovery Plan, Southwestern Willow Flycatcher. Region 2, USFWS, Albuquerque, NM. April 2001.

APPENDIX A

WILLOW FLYCATCHER NEST SITE DATA AND MONITORING FORMS

APPENDIX A

TABLE OF CONTENTS

LF-11, Nest 1 ..... A-1
LF-17, Nest 1 ..... A-4
LF-17, Nest 2 ..... A-7
LF-17, Nest 3 ..... A-10
LF-17, Nest 4 ..... A-13
LF-17, Nest 5 ..... A-16
LF-17, Nest 6 ..... A-19
LF-17, Nest 7 ..... A-22
LF-17, Nest 8 ..... A-25
LF-17, Nest 9 ..... A-28
LF-17, Nest 10 ..... A-31
LF-17, Nest 11 ..... A-34
LF-17, Nest 12 ..... A-37
LF-17, Nest 13 ..... A-40
LF-17, Nest 14 ..... A-43
LF-17, Nest 15 ..... A-46
LF-17, Nest 16 ..... A-49
LF-17, Nest 17 ..... A-52
LF-17, Nest 18 ..... A-55
LF-17, Nest 19 ..... A-58
LF-17, Nest 20 ..... A-61
LF-17, Nest 21 ..... A-64
LF-17, Nest 22 ..... A-67
LF-17, Nest 23 ..... A-70
LF-17, Nest 24 ..... A-73
LF-17, Nest 25 ..... A-76
LF-17, Nest 26 ..... A-79
LF-17A, Nest 1 ..... A-82
LF-17A, Nest 2 ..... A-85
LF-17A, Nest 2A A-88
LF-17A, Nest 3 ..... A-91
LF-17A, Nest 4 ..... A-94
LF-17A, Nest 5 ..... A-97
LF-17A, Nest 6 ..... A-100
LF-17A, Nest 7 ..... A-103
LF-17A, Nest 8 ..... A-106
SV-03, Nest 1 ..... A-109
SV-03, Nest 1A A-112
SV-03, Nest 2 ..... A-115
SV-03, Nest 3 ..... A-118

SV-09, Nest 1 ..... A-121
SV-09, Nest 2 ..... A-124
SV-09, Nest 2A A-127
SV-09, Nest 3 ..... A-130
SV-09, Nest 4 ..... A-133

APPENDIX B

WILLOW FLYCATCHER SURVEY AND DETECTION FORMS

APPENDIX B

TABLE OF CONTENTS

La Canova B-1
La Rinconada B-5
Garcia Acequia B-9
ALB-01 ..... B-13
Bosque Channel Widening Site B-17
LF-01 ..... B-21
LF-03 ..... B-25
LF-09 ..... B-29
LF-10 ..... B-33
LF-11 ..... B-37
LF-12 ..... B-41
LF-13 ..... B-45
LF-14 ..... B-49
LF-15 ..... B-53
LF-16 ..... B-57
LF-17 ..... B-61
LF-17A B-65
LF-18 ..... B-69
LF-19 ..... B-73
LF-20 ..... B-77
LF-27 ..... B-81
LF-28 ..... B-85
LF-29 ..... B-89
LF-30 ..... B-93
LF-31 ..... B-97
LF-32 ..... B-101
LFCC-1 ..... B-105
LFCC-2 ..... B-109
LFCC-3 ..... B-113
LFCC-4 ..... B-117
LFCC-5A B-121
LFCC-5B B-125
LFCC-6 ..... B-129
LFCC-7 ..... B-133
EB Delta B-137
SV-03 ..... B-141
SV-04 ..... B-145
SV-09 ..... B-149

APPENDIX C

WILLOW FLYCATCHER SURVEY SUMMARIES

APPENDIX C

TABLE OF CONTENTS

La Canova C-1
La Rinconada C-2
Garcia Acequia C-3
ALB-01 ..... C-4
Bosque Channel Widening Site C-5
LF-01 ..... C-6
LF-03 ..... C-7
LF-09 ..... C-8
LF-10 ..... C-9
LF-11 ..... C-10
LF-12 ..... C-11
LF-13 ..... C-12
LF-14 ..... C-13
LF-15 ..... C-14
LF-16 ..... C-15
LF-17 ..... C-16
LF-17A C-17
LF-18 ..... C-18
LF-19 ..... C-19
LF-20 ..... C-20
LF-27 ..... C-21
LF-28 ..... C-22
LF-29 ..... C-23
LF-30 ..... C-24
LF-31 ..... C-25
LF-32 ..... C-26
LFCC-1 ..... C-27
LFCC-2 ..... C-28
LFCC-3 ..... C-29
LFCC-4 ..... C-30
LFCC-5A C-31
LFCC-5B C-32
LFCC-6 ..... C-33
LFCC-7 ..... C-34
EB-Delta C-35
SV-03 ..... C-36
SV-04 ..... C-37
SV-09 ..... C-38

Site Name: LA CANOVA

Survey Dates: 5/21, 6/10, 6/25 and 7/13

Total Survey Effort: 15.5 hours

Number of Willow Flycatchers Observed: 3 (2%, 1&)

Estimated Number of Pairs: 1

Estimated *Number* of *E. t extimus* at this Site: 3 (2%, 1&)

Estimated Number of Territories: 1

Nest(s) Found: No

Area: 3.2 ha

*** No habitat suitability model information is available for this site.**

Location: UTM coordinates Zone 13 south from 4,004,023 m northing and 412,292 m easting, to 4,003,883 m northing and 412,533 m easting. West bank of Rio Grande from River Mile 283.7-283.9.

Site Description: Dominant vegetative coverage at this site consisted of 80 percent willow, 5 to 10 percent cottonwood, 5 percent Russian olive, and 5 percent open space. The overall height of the willows ranged from 6 to 10 m with most of the mature cottonwoods dead. The area is not large in size but is somewhat isolated from human disturbance due to its location on the western bank of the Rio Grande where little development has taken place. Southwestern willow flycatchers occupied this site from 1995-1997, and in 2000 and 2001. Only a single migrant has been observed during the first survey during 1998 and 1999. Overbank flooding was present during the 1st and 2nd survey periods of the 2001 season.

Habitat Suitability: The dominant willow/cottonwood habitat continues to provide suitable breeding habitat for the species. The vegetation at this site has continued to mature since surveys began in 1995, which has increased the extent of suitable habitat.

Site Name: LA RINCONADA

Survey Dates: 5/21, 6/10, 6/25 and 7/13

Total Survey Effort: 3 hours

Number of Willow Flycatchers Observed: 1 (%)

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Area: 2.6 ha

*** No habitat suitability model information is available for this site.**

Location: UTM coordinates Zone 13 south, 4,001,207 m northing and 410,670 m easting.

Site Description: The eastern bank varies in habitat quality and vegetation: Guitterez's property adjacent the Rio Grande supports small stands of dense willows (4 to 6 m tall) with a cottonwood overstory (9 to 12 m tall). The Garcia property has been cleared of all vegetation and is a fallow field to the river=s edge. The Martinez property supports a narrow strip (9 to 15 m wide) of mature cottonwoods with some box elder. Beaver and human activity have resulted in cuttings of both willow and cottonwoods at this site. This site has supported southwestern willow flycatchers since surveys were initiated in 1995, however no WIFL territories were found at this site in 2001..

Habitat Suitability: The Guitterez property, which provides suitable WIFL habitat, is less than 0.3 ha in size. The Martinez property lacks a dense understory, providing only a 9- to 12-m canopy and appears to be unsuitable habitat for the species. The river bar, which is dominated by Russian olive, and the Garcia property, which has been cleared of all vegetation, are unsuitable for supporting the species.

Site Name: GARCIA ACEQUIA

Survey Dates: 5/21, 6/10, 6/25 and 7/13

Total Survey Effort: 2 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Area: 1.3 ha

*** No habitat suitability model information is available for this site.**

Location: UTM coordinates Zone 13 south, 4,001,344 m northing and 411,607 m easting.

Site Description: Approximately 70 percent of the site was dominated with 3- to 6-m-tall willows. Larger cottonwood, elm, and Russian olive formed a 9- to 12-m canopy on the south side of the site and immediately adjacent the Rio Grande to the west. Hydrologic conditions were similar to 2000, with dry soil persisting over all survey periods. Nesting at this site was confirmed in previous years, however extensive survey efforts did not detect WIFLs in 2001.

Habitat Suitability: This site has been occupied by southwestern willow flycatchers since surveys began in 1995 and continues to be suitable breeding habitat for the species. Similar to the La Canova site, the willows continue to mature at this site, increasing the extent of suitable breeding habitat for the southwestern willow flycatcher.

Site Name: ALB-01

Survey Dates: 6/1 and 6/26

Total Survey Effort: 8.5 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of E. t. extimus at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Area: 4.7 km

*** No habitat suitability model information is available for this site.**

Location: The site lies adjacent the eastern bank of the Rio Grande River Montano Bridge on the north, to the I-40 bridge to the south.

Site Description: The site is dominated by a mix of Russian olive, saltcedar, and mature cottonwood. The site does not experience overbank flooding, nor does it possess areas of moist or saturated soils. An extensive network of maintained, and non-maintained trails have been established throughout the site. All trails are heavily used for recreational purposes.

Habitat Suitability: This site lacks the density, structure, or hydrology needed for suitable or marginally suitable WIFL habitat. Due to the absence of WIFL habitat, surveys were discontinued after the second survey.

Site Name: BOSQUE CHANNEL WIDENING SITE

Survey Dates: 6/1, 6/14, 7/9, 7/16 and 7/26

Total Survey Effort: 7.75 hours

Number of Willow Flycatchers Observed: 1 (%)

Estimated Number of Pairs: 0

Estimated Number of *E. t extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Area: .37 km

*** No habitat suitability model information is available for this site.**

Site Description: This site runs along the west side of the Rio Grande, in the Bosque NWR. There are some tall willows and cottonwoods surrounded by tamarisk. Much of the site has been mowed or otherwise impacted by human and livestock activity. The site did not experience overbank flooding and remained relatively dry during the course of the 2001 field season.

Habitat Suitability: The area closest to the river bank has the highest suitability. Much of the site has been mowed, thus is completely unsuitable WIFL habitat. This site generally lacks both the vegetation structure and soil moisture that contribute to good WIFL habitat.

Site Name: LF-01

Survey Dates: 5/24, 6/11, 7/3, 7/21 and 7/27

Total Survey Effort: 7 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	11.1	4.7
Suitable mixed native/exotic riparian	2.1	0.9
Marginally suitable exotic riparian	10.2	4.3
Potential with future riparian vegetation growth and development	77.4	32.7
Low suitability	136.1	57.5
TOTAL	236.8	100

Comments: The site remains dry even during periods of high flows in the Rio Grande. Generally, the site was relatively open and lacked sufficient density and structure as breeding habitat for the species. This site was surveyed in conjunction with BBIRD monitoring activities.

Site Name: LF-03

Survey Dates: 5/24, 6/11, 7/3, 7/21 and 7/27

Total Survey Effort: 11.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	6.9	4.9
Suitable mixed native/exotic riparian	3.0	2.1
Marginally suitable exotic riparian	3.5	2.5
Potential with future riparian vegetation growth and development	45.9	32.7
Low suitability	81.0	57.8
TOTAL	140.2	100

Comments: Generally, the site was relatively open and lacked sufficient vegetation density and structure, thus is unsuitable as breeding habitat. However, the dense cottonwood, saltcedar, and coyote willows at the southern end of the site provide potentially suitable habitat The site does not possess saturated soils or any surface water other than the adjacent Rio Grande. The site does not experience overbank flooding even during periods of high river flows, and remains dry. This site was surveyed in conjunction with BBIRD monitoring activities.

Site Name: LF-09

Survey Dates: 5/24, 6/8, 6/28, 7/11 and 7/24

Total Survey Effort: 26 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	8.7	12.2
Suitable mixed native/exotic riparian	4.8	6.7
Marginally suitable exotic riparian	0.0	0.0
Potential with future riparian vegetation growth and development	6.6	9.3
Low suitability	51.1	71.8
TOTAL	71.1	100

Comments: This site is generally dominated by native vegetation. Vegetation is comprised of cottonwood, Goodding's willow, coyote willow, and tamarisk. Mature cottonwoods were up to 18 m in height, and younger cottonwoods were up to 13 m in height. Tamarisk and Goodding's willow ranged from 7 to 9 m in height, while coyote willow stands ranged from 3 to 6 m in height. Much of the site remains dry during high flow events which limits the breeding habitat suitability for southwestern willow flycatchers. This site supported a relatively large population of Bell's vireos.

Site Name: LF-10

Survey Dates: 5/24, 6/7-6/8, 6/28, 7/11 and 7/24

Total Survey Effort: 25.5 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	17.8	30.8
Suitable mixed native/exotic riparian	15.6	27.1
Marginally suitable exotic riparian	7.0	12.2
Potential with future riparian vegetation growth and development	7.6	13.2
Low suitability	9.7	16.8
TOTAL	57.7	100

Comments: This site supports dense native (predominately) and exotic vegetation, broken by channels. Dense stands are comprised of willow, tamarisk, and young cottonwoods. The vegetation ranges from an overall height of 6 to 8 m. This site also supported a relatively large population of Bell's vireos. Much of this site is subject to periodic overbank flooding.

Site Name: LF-11

Survey Dates: 5/18 & 5/21, 6/6-6/7, 6/21, 7/9 and 7/17

Total Survey Effort: 31.75 hours

Number of Willow Flycatchers Observed: 3 (2%,1&)

Estimated Number of Pairs: 1

Estimated Number of *E. t. extimus* at this Site: 2 (1%,1&)

Estimated Number of Territories: 1

Nest(s) Found: Yes (1)

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	31.0	70.3
Suitable mixed native/exotic riparian	3.8	8.7
Marginally suitable exotic riparian	0.0	0.0
Potential with future riparian vegetation growth and development	9.3	21.0
Low suitability	0.0	0.0
TOTAL	44.1	100

Comments: This site is comprised of native (predominately) and exotic vegetation that is subject to flooding during peak flow events. Cottonwoods typically range from 8 to 10 m in height, while Goodding♠s willow and tamarisk range from 4 to 8 m. Coyote willow is typically a component of the understory, but can be found in small homogenous stands throughout the site. Some areas consist of mature Goodding♠s willow interspersed with intermediate cottonwoods, with an understory of young Goodding♠s willow and cottonwoods. Extensive overbank flooding affected this site during the 2001 breeding season.

Site Name: LF-12

Survey Dates: 5/18 & 5/21, 6/5, 6/21-6/22, 7/3 and 7/18

Total Survey Effort: 28.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	45.0	72.3
Suitable mixed native/exotic riparian	5.3	8.5
Marginally suitable exotic riparian	5.4	8.7
Potential with future riparian vegetation growth and development	6.6	10.5
Low suitability	0.0	0.0
TOTAL	62.2	100

Comments: This site supports dense, predominately native vegetation, broken by high flow channels. Dense stands are comprised of interspersed willow, tamarisk, and young cottonwoods. The canopy varies from 8 to 13 m in height, and young willow stands range from 1.5 to 8 m in height. A mature cottonwood gallery is supported adjacent to the Rio Grande. This site was subject to overbank flooding in the early to mid-2001 breeding season.

Site Name: LF-13

Survey Dates: 5/18 & 5/21, 6/5, 6/22, 7/9 and 7/18

Total Survey Effort: 32 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	6.0	12.8
Suitable mixed native/exotic riparian	39.7	85.0
Marginally suitable exotic riparian	0.4	0.9
Potential with future riparian vegetation growth and development	0.6	1.3
Low suitability	0.0	0.0
TOTAL	46.7	100

Comments: The site supports dense stands of Goodding's willow/tamarisk, and cottonwood/tamarisk, with large open areas. The site is dominated by native vegetation and supports cottonwoods ranging from 8 to 13 m in height, and Goodding's willow from 5 to 12 m in height. Some overbank flooding was present in the early 2001 breeding season.

Site Name: LF-14

Survey Dates: 5/18 & 5/21, 6/6, 6/22, 7/9 and 7/18

Total Survey Effort: 26.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	13.8	75.4
Suitable mixed native/exotic riparian	1.7	9.3
Marginally suitable exotic riparian	0.5	2.7
Potential with future riparian vegetation growth and development	2.2	12.0
Low suitability	0.1	0.5
TOTAL	18.3	100

Comments: Vegetation in the northern portion of the site is variable with patches of dense tamarisk, Goodding's willow, and cottonwood. The southern end of the site is comprised primarily of dense cottonwood and Goodding's willow. The average height of the canopy ranges from 8 to 12 m.. Much of the site is either subject to flooding or supports saturated soil conditions during periods of peak flows within the Rio Grande.

Site Name: LF-15

Survey Dates: 5/18 & 5/21, 6/6, 6/22, 7/9 and 7/24

Total Survey Effort: 25.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	6.8	28.5
Suitable mixed native/exotic riparian	8.2	34.3
Marginally suitable exotic riparian	4.8	20.1
Potential with future riparian vegetation growth and development	4.1	17.2
Low suitability	0.0	0.0
TOTAL	23.9	100

Comments: This site supports predominately native vegetation comprised of cottonwood, Goodding's willow, and coyote willow. Exotic tamarisk typically is a component of the understory in some areas. The vegetation was generally dense and of uniform height ranging from 12 to 14 m.. The structure and density of vegetation, and hydrologic conditions supported at this site, provide some areas of highly suitable breeding habitat for WIFLs. This site was subject to minor overbank flooding during the early 2001 breeding season.

Site Name: LF-16

Survey Dates: 5/23, 6/15, 7/10, 7/17 and 7/23

Total Survey Effort: 21.5 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	15.9	37.2
Suitable mixed native/exotic riparian	0.0	0.0
Marginally suitable exotic riparian	0.0	0.0
Potential with future riparian vegetation growth and development	0.9	2.0
Low suitability	26.0	60.8
TOTAL	42.7	100

Comments: This site supports intermediate growth cottonwoods, mature cottonwoods, intermediate growth Goodding's willow, and areas of understory tamarisk. Dense stands of Goodding's willow and cottonwood up to 15 m in height are scattered throughout the site. Generally, the site has nearly 100 percent canopy closure with a dense midstory. The historic Rio Grande channel runs directly through the site, creating areas of ponded and flowing water during high flow events. Since 1999, low reservoir elevations have reduced the quality of habitat, particularly near the southern end of the site. The primary restriction is the lack of overbank flooding and/or moist soil conditions, as was the case in 2001. The habitat suitability at this site can vary from year to year based on reservoir elevations. During periods of high reservoir elevations, the hydrologic component of habitat suitability is restored to some of the areas within the site.

Site Name: LF-17

Survey Dates: 5/30-5/31, 6/12, 6/26, 7/14 and 7/23

Total Survey Effort: 48.5 hours

Number of Willow Flycatchers Observed: 30 (15%, 15&)

Estimated Number of Pairs: 15

Estimated Number of *E. t. extimus* at this Site: 30 (15%, 15&)

Estimated Number of Territories: 15

Nest(s) Found: Yes (26 - including 9 second broods and 2 re-nests)

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	24	28.2
Suitable mixed native/exotic riparian	0.0	0.0
Marginally suitable exotic riparian	0.0	0.0
Potential with future riparian vegetation growth and development	2.0	2.3
Low suitability	59.1	69.4
TOTAL	85.1	100

Comments: This site encompasses cottonwood/willow vegetation to the west of the low flow channel temporary outfall in the headwaters of the Elephant Butte Reservoir. The breeding habitat suitability of this site is affected by reservoir elevations. During periods of high reservoir elevations, the extent of highly suitable breeding habitat increases. Goodding=s willow dominates the site, with an interspersion of cottonwood. The average canopy height ranges from 10 to 13 m. The understory is predominately tamarisk stressed by the dense canopy created by the Goodding=s willow and cottonwoods. The nest sites during the 1997-2001 seasons were dominated by dense Goodding=s willow and flooded due to beaver activity and flows from the breached conveyance channel. Much of the site contained either flowing or pooled water, or saturated soil during 2001.

Site Name: LF-17A

Survey Dates: 5/29, 6/10, 6/30, 7/12 and 7/25

Total Survey Effort: 40.5 hours

Number of Willow Flycatchers Observed: 14 (7%, 7&)

Estimated Number of Pairs: 7

Estimated Number of *E. t. extimus* at this Site: 14 (7%, 7&)

Estimated Number of Territories: 7

Nest(s) Found: Yes (9 - including 1 second brood and 2 re-nests)

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	12.0	55.5
Suitable mixed native/exotic riparian	0	0.0
Marginally suitable exotic riparian	0	0.0
Potential with future riparian vegetation growth and development	0	0.0
Low suitability	9.6	44.5
TOTAL	21.6	100

Comments: This site consists mostly of dense *Typha* sp. in the western half, with small isolated islands dominated by Goodding=s willow and cottonwood. The eastern half of the site is dominated by Goodding=s willow with an interspersion of coyote willow, cottonwood, and salt cedar. The average canopy height ranges from 10 to 13 m.. The nest sites found during the 2000 and 2001 seasons were dominated by dense Goodding=s willow and flooded by flows from the breached low flow conveyance channel. Much of the site is flooded, surrounded by open water, and/or saturated soil conditions. During periods of high reservoir elevations the extent of highly suitable breeding habitat increases.

Site Name: LF-18

Survey Dates: 5/29, 6/13, 7/3, 7/17 and 7/26

Total Survey Effort: 17.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	17.9	96.8
Suitable mixed native/exotic riparian	0.0	0.0
Marginally suitable exotic riparian	0.0	0.0
Potential with future riparian vegetation growth and development	0.6	3.2
Low suitability	0.0	0.0
TOTAL	18.5	100

Comments: LF-18 is a relatively narrow strip of highly suitable vegetation, subject to frequent flooding and saturated soil conditions. In 2001, however, the site remained dry. The site is dominated by Goodding's willow and cottonwood up to 13 m in height with an interspersion of tamarisk in the more open areas. Dense pockets of coyote willow were also found along the banks of the Rio Grande.

Site Name: LF-19

Survey Dates: 5/29, 6/15, 7/4, 7/11 and 7/23

Total Survey Effort: 24.5 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	11.4	12.4
Suitable mixed native/exotic riparian	1.5	1.6
Marginally suitable exotic riparian	0.0	0.0
Potential with future riparian vegetation growth and development	3.3	3.6
Low suitability	75.7	82.4
TOTAL	91.9	100

Comments: Cottonwoods 12 to 15 m in height, Goodding's willows 10 to 13 m in height, and tamarisk 5 to 8 m in height are supported at this site Dense tamarisk patches adjacent to the levee and dense Goodding's willow stands at the south end along the levee and along the old river channel comprise the most suitable flycatcher habitat. Most of the site remained dry during the 2001 season, primarily due to low reservoir elevations. During high reservoir elevations, a significant portion of this site is subject to flooding, which increases the breeding habitat suitability.

Site Name: LF-20

Survey Dates: 5/30, 6/19, 7/4, 7/21 and 7/27

Total Survey Effort: 15.5 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	0.0	0.0
Marginally suitable exotic riparian	0.0	0.0
Potential with future riparian vegetation growth and development	0.0	0.0
Low suitability	34.4	100
TOTAL	34.4	100

Comments: This site contains extensive areas of dead and dying willows and tamarisk. Some areas of new growth less than 4 m in height were also found. Generally, the site was covered by 60 to 70 percent dead tamarisk. Young stands of developing Goodding's willow are becoming established in some areas. Several stands of willow and tamarisk are already established, providing suitable breeding habitat when reservoir elevations are high. Nearly the entire site is inundated when reservoir elevations are high. During the 1999 season, some surface water was present in low lying areas. The site was dry in 2000 and 2001, however, and thus was classified as possessing habitat of low suitability. Young developing stands of willows may increase the extent of highly suitable breeding habitat if reservoir elevations increase and the willows continue to develop.

Site Name: LF-27

Survey Dates: 5/24, 6/7, 6/25, 7/10 and 7/19

Total Survey Effort: 26 hours

Number of Willow Flycatchers Observed: 6 (4% 2&)

Estimated Number of Pairs: 2

Estimated Number of *E. t. extimus* at this Site: 4 (2% 2&)

Estimated Number of Territories: 2

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	7.8	21.8
Suitable mixed native/exotic riparian	21.5	59.9
Marginally suitable exotic riparian	1.6	4.4
Potential with future riparian vegetation growth and development	2.0	5.5
Low suitability	3.0	8.3
TOTAL	35.9	100

Comments: This site is dominated with cottonwood, Goodding's willow, coyote willow, and tamarisk. The cottonwoods and Goodding's willow provide an overstory for the tamarisk and isolated stands of coyote willow. The stands of coyote willow are found predominately along the banks of the Rio Grande where scouring events over the past several years have created suitable conditions for the willows to become established. Successful nesting attempts during the 1998 /1999 breeding season may have been responsible for the establishment of 2 territories during the 2000 and 2001 breeding season. The structure, density, and hydrology of this site, in close proximity to the historic WIFL territories north of the railroad bridge, all increase the value of this site as WIFL breeding habitat. This site remained dry during the 2001 breeding season.

Site Name: LF-28

Survey Dates: 5/22, 6/7, 6/25, 7/10 and 7/19

Total Survey Effort: 18.25 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	14.1	75.9
Marginally suitable exotic riparian	2.9	15.8
Potential with future riparian vegetation growth and development	0.6	3.5
Low suitability	0.9	4.9
TOTAL	18.6	100

Comments: The site is a relatively narrow strip of vegetation comprised primarily of cottonwood, Goodding's willow, coyote willow, and tamarisk. The cottonwoods and Goodding's willow provided an overstory for the tamarisk and isolated stands of coyote willow. The stands of coyote willow are found predominately along the banks of the Rio Grande where scouring events over the past several years have created suitable conditions for the willows to become established. The average canopy height was approximately 10 to 12 m.. This site was partially flooded during the early part of the 2001 breeding season.

Site Name: LF-29

Survey Dates: 5/22, 6/11, 6/29, 7/10 and 7/19

Total Survey Effort: 28 hours

Number of Willow Flycatchers Observed: 3 (3%)

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0 - assumed to be migrants

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	1.3	4.3
Suitable mixed native/exotic riparian	9.5	30.2
Marginally suitable exotic riparian	19.0	60.2
Potential with future riparian vegetation growth and development	1.7	5.4
Low suitability	0.0	0.0
TOTAL	31.5	100

Comments: This site is dominated by cottonwood, Goodding's willow, coyote willow, and tamarisk. The cottonwoods and Goodding's willow provided an overstory for the tamarisk and isolated stands of coyote willow. The stands of coyote willow are found predominately along the banks of the Rio Grande where scouring events over the past several years have created suitable conditions for the willows to become established. Much of the interior of the site is dominated by tamarisk. The average canopy height was approximately 10 m. Overbank flooding was prevalent during most of the 2001 breeding season.

Site Name: LF-30

Survey Dates: 5/22, 6/11, 6/28, 7/9 and 7/19

Total Survey Effort: 27.25 hours

Number of Willow Flycatchers Observed: 1 (&)

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0 - assumed to be a migrant

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	9.7	36.8
Suitable mixed native/exotic riparian	1.0	4.0
Marginally suitable exotic riparian	9.9	37.7
Potential with future riparian vegetation growth and development	0.0	0.0
Low suitability	5.7	21.5
TOTAL	26.4	100

Comments:. This site is dominated by native vegetation (especially in the northern portion) which provides highly suitable breeding habitat, but also supports an interspersion of tamarisk. The vegetation is relatively dense, with the coyote willow and tamarisk forming an understory, and the Goodding's willow and cottonwood forming an overstory. The average height of the canopy ranged from 8 to 10 m. Overbank flooding was prevalent during most of the 2001 breeding season.

Site Name: LF-31

Survey Dates: 5/23, 6/20, 7/6, 7/16 and 7/27

Total Survey Effort: 27.25 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	29.4	79.5
Suitable mixed native/exotic riparian	4.1	11.0
Marginally suitable exotic riparian	0.6	1.6
Potential with future riparian vegetation growth and development	2.9	7.9
Low suitability	0.0	0.0
TOTAL	37.0	100

Comments: This site is dominated by native vegetation, but supports an interspersion of tamarisk. The vegetation is relatively dense, with the coyote willow and tamarisk forming an understory, and the Goodding's willow and cottonwood forming an overstory. The average height of the canopy is approximately 10 m. Some relatively large, dense stands of native dominated vegetation are found near the center of this site. This site was subject to overbank flooding early in the 2001 breeding season. Overbank flooding during high flow events creates extensive areas of ponded water which remain after flows in the Rio Grande are contained within the channel.

Site Name: LF-32

Survey Dates: 5/22, 6/20, 7/6, 7/16 and 7/27

Total Survey Effort: 30.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Model:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	41.4	92.0
Suitable mixed native/exotic riparian	0.5	1.1
Marginally suitable exotic riparian	0.4	0.8
Potential with future riparian vegetation growth and development	2.7	6.1
Low suitability	0.0	0.0
TOTAL	45.0	100

Comments: The site is dominated by relatively dense stands of Goodding's willow and cottonwood. The maturing willow/cottonwood community north of the 1830 berm that supported southwestern willow flycatchers in 1995 may not be presently as suitable as it once was. There appears to be a continuing reduction in the density of the midstory that is typical of maturing stands of native vegetation. Much of the site was flooded during the early part of the WIFL breeding season in 1999, but was mainly dry during the 2000 and 2001 field seasons. This site supported WIFLs in 1995, but not in subsequent breeding seasons. The absence of territorial or breeding WIFLs from 1996-2001 may be a result of maturing vegetation. Although this site may be somewhat decreasing in habitat suitability as the vegetation matures, there still remains an abundance of highly suitable breeding habitat for the WIFL.

Site Name: LFCC -1

Survey Dates: 5/29 (subsequent surveys were not performed due to safety concerns)

Total Survey Effort: 3 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	5.3	9.7
Marginally suitable exotic riparian	14.5	26.4
Potential with future riparian vegetation growth and development	0.0	0.0
Low suitability	80.1	145.7
TOTAL	181.8	100

Comments: This site is dominated by stands of dead saltcedar and cattails. Some stands of intermediate age saltcedar, cottonwood and willow do persist in some areas. Much of the area remains flooded throughout the year due to existing breaches in the LFCC. In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: LFCC -2

Survey Dates: 5/30, 6/19, 7/2, 7/13 and 7/25

Total Survey Effort: 18 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	1.9	2.3
Marginally suitable exotic riparian	14.5	18.4
Potential with future riparian vegetation growth and development	0.5	0.6
Low suitability	62.0	78.6
TOTAL	78.8	100

Comments: This site is dominated by stands of dead saltcedar intermixed with emergent vegetation, and dry overstory and intermediate aged saltcedar. Some stands of intermediate age saltcedar, cottonwood and willow in close proximity to surface water are present and provide areas that could potentially be occupied by WIFLs. The southern end of the site remains flooded throughout the year due to existing breaches in the LFCC. In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: LFCC - 3

Survey Dates: 6/4, 6/19, 7/2, 7/13 and 7/24

Total Survey Effort: 24.25 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	1.4	1.0
Marginally suitable exotic riparian	27.2	19.0
Potential with future riparian vegetation growth and development	0.4	0.3
Low suitability	114.3	79.8
TOTAL	143.3	100

Comments: This site is dominated by stands of dry intermediate aged saltcedar. Some stands of intermediate age saltcedar, in close proximity to surface water, provide areas that could potentially be occupied by WIFLs. Most of the site remains dry throughout the year. A small portion of the site, near the southern end, does experience saturated soils and periodic surface water due to a high water table and a breach in the LFCC. In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: LFCC - 4

Survey Dates: 6/1, 6/18, 7/3, 7/13 and 7/25

Total Survey Effort: 27.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	12.7	9.9
Marginally suitable exotic riparian	11.7	9.1
Potential with future riparian vegetation growth and development	0.8	0.6
Low suitability	103.9	80.4
TOTAL	129.1	100

Comments: This site is dominated by stands of relatively dry saltcedar, intermixed with a few mature cottonwoods. Some stands of dense saltcedar and cottonwood, in close proximity to surface water, are present and provide areas that could potentially be occupied by WIFLs. Near the center of the site, a historic high flow channel typically contains surface water and saturates adjacent soils. In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: LFCC-5a

Survey Dates: 5/31, 6/14, 6/29, 7/12 and 7/20

Total Survey Effort: 21.5 hours

Number of Willow Flycatchers Observed: 1 (%)

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0 - assumed to be a migrant

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	3.9	1.9
Marginally suitable exotic riparian	4.4	2.2
Potential with future riparian vegetation growth and development	2.7	1.3
Low suitability	192.7	94.6
TOTAL	203.7	100

Comments: This site is dominated by stands of relatively dry understory and intermediate-aged saltcedar, intermixed with a few mature cottonwoods. Some stands of intermediate-aged saltcedar intermixed with mature cottonwoods are in close proximity to surface water and provide areas that could potentially be occupied by WIFLs. Also, stands of understory saltcedar in close proximity to surface water could potentially develop into WIFL habitat. In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: LFCC - 5B

Survey Dates: 5/31, 6/18, 7/3, 7/12 and 7/20

Total Survey Effort: 26 hours

Number of Willow Flycatchers Observed:

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	5.6	3.1
Marginally suitable exotic riparian	28.4	15.6
Potential with future riparian vegetation growth and development	0.3	0.2
Low suitability	147.2	147.2
TOTAL	181.5	100

Comments: This site is dominated by stands of relatively dry understory and intermediate-aged saltcedar, intermixed with a few mature cottonwoods. Some stands of intermediate-aged saltcedar are in close proximity to surface water and provide areas that could potentially be occupied by WIFLs. Also, stands of understory saltcedar in close proximity to surface water could potentially develop into WIFL habitat. In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: LFCC - 6

Survey Dates: 5/25, 6/12, 6/29, 7/12 and 7/20

Total Survey Effort: 28.25 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	0.0	0.0
Marginally suitable exotic riparian	6.9	3.4
Potential with future riparian vegetation growth and development	12.6	6.2
Low suitability	182.4	90.3
TOTAL	201.9	100

Comments: In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: LFCC - 7

Survey Dates: 5/25, 6/12, 6/29, 7/12 and 7/20

Total Survey Effort: 27.25 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t. extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	0.0	0.0
Marginally suitable exotic riparian	3.4	1.7
Potential with future riparian vegetation growth and development	0.4	0.2
Low suitability	191.3	98.1
TOTAL	195.1	100

Comments: This site is dominated by stands of intermediate and overstory saltcedar, intermixed with a few mature cottonwoods. The site is dry except for surface water within the LFCC and a small depression of ponded water to the west of the LFCC. Some stands of intermediate-age saltcedar and cottonwood immediately to the west of the LFCC are in close proximity to surface water and provide areas that could potentially be occupied by WIFLs. In general, this site does not support the structure and density of vegetation that is required for breeding WIFLs.

Site Name: EB Delta

Survey Dates: 6/2 & 6/5, 6/15, 7/3, 7/17 and 7/26

Total Survey Effort: 19.75 hours

Number of Willow Flycatchers Observed: 0

Estimated Number of Pairs: 0

Estimated Number of *E. t extimus* at this Site: 0

Estimated Number of Territories: 0

Nest(s) Found: No

*** No habitat suitability model information is available for this site.**

Comments: This site consists of a mix of native and exotic vegetation. Willows and cottonwoods are primarily located adjacent to the levee road on the west side of the Rio Grande. Tamarisk and cattails are more prevalent in the western portion of the site. Good vegetative structure exists, however there is a scarcity of soil moisture. This site has the potential to provide highly suitable WIFL habitat if it is subject to periodic flooding.

Site Name: SV-03

Survey Dates: 5/19, 6/23, 7/3 and 7/13

Total Survey Effort: 18.25 hours

Number of Willow Flycatchers Observed: 6 (3♂, 3♀)

Estimated Number of Pairs: 3

Estimated Number of *E. t extimus* at this Site: 6 (3♂, 3♀)

Estimated Number of Territories: 3

Nest(s) Found: Yes (4 - including 1 re-nest)

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	0.9	3.7
Marginally suitable exotic riparian	10.3	42.8
Potential with future riparian vegetation growth and development	2.0	8.2
Low suitability	10.9	45.2
TOTAL	24	100

Comments: This site is dominated by stands of intermediate and overstory saltcedar, with some small remnant patches of mature, overstory Goodding♠s willow. Understory coyote willow up to 3 m high was interspersed with the Goodding♠s willow. The site becomes more open and patchy on its southern end. The suitability of this site is apparently localized to dense stands of mature saltcedar, in close proximity to the Rio Grande.

Site Name: SV-04

Survey Dates: 5/18, 6/22, 6/29, 7/9, 7/16

Total Survey Effort: 21.5 hours

Number of Willow Flycatchers Observed: 2 (1%,1&)

Estimated Number of Pairs: 1

Estimated Number of *E. t extimus* at this Site: 2 (1%,1&)

Estimated Number of Territories: 1

Nest(s) Found: No

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	2.8	5.0
Suitable mixed native/exotic riparian	1.5	2.6
Marginally suitable exotic riparian	8.4	15.1
Potential with future riparian vegetation growth and development	1.0	1.7
Low suitability	41.9	75.5
TOTAL	55.5	100

Comments: This site is dominated by stands of intermediate and overstory saltcedar, intermixed with a few Russian olives, with a remnant patch of coyote willow averaging 5 m high near the western bank of the Rio Grande. The site is relatively dry. No evidence of historic overbank flooding has been observed at the site. This site generally lacks overstory vegetation that is consistent with breeding requirements of the WIFL. More suitable habitat can be found along the western bank of the Rio Grande where there is adequate overstory vegetation and a mix of coyote willow average 5 m high.

Site Name: SV-09

Survey Dates: 5/17, 6/23-24, 7/2, 7/11-7/12 and 7/26-7/27

Total Survey Effort: 37 hours

Number of Willow Flycatchers Observed: 13 (7%, 6&)

Estimated Number of Pairs: 6

Estimated Number of *E. t extimus* at this Site: 13 (7%, 6&)

Estimated Number of Territories: 7

Nest(s) Found: Yes (5 - including 1 re-nest)

Habitat Suitability Table:

WIFL Habitat Category	Hectares per site	Percent habitat per site
Highly suitable native riparian	0.0	0.0
Suitable mixed native/exotic riparian	13.5	19.8
Marginally suitable exotic riparian	0.0	12.1
Potential with future riparian vegetation growth and development	12.5	7.5
Low suitability	92.8	60.6
TOTAL	81.6	100

Comments: This site is dominated by very dense stands of Russian olive, and sandy openings containing small patches of saltcedar. Adjacent to the river edge, saltcedar, Russian olive, and coyote willow stands create a thin strip of habitat where WIFLs were detected in 2000. In 2001 WIFLs were found adjacent high flow channels which supported predominately native vegetation. This site generally lacks vegetation that is consistent with breeding requirements of the WIFL, the exception being riparian habitat adjacent to the Rio Grande and the high flow channels.