

CHAPTER 3

COLOR-BANDING AND RESIGHTING

INTRODUCTION

Long-term monitoring of willow flycatchers of known identity, sex, and age is the only effective way to determine demographic life history parameters such as annual survivorship of adults and young, site fidelity, seasonal and between-year movements, and population structure. Thus, as an integral part of life history studies, we captured and uniquely color-banded as many willow flycatchers as possible, allowing field personnel to resight individuals throughout the breeding season, as well as in subsequent years. Resighting consisted of using binoculars to determine the identity of a color-banded flycatcher by observing, from a distance, the unique color combination on its legs. This allowed field personnel to detect and monitor individuals without recapturing each bird. This was our second consecutive year of color-banding studies and builds upon color-banding initiated at these sites in 1998 (McKernan and Braden 1999).

METHODS

COLOR-BANDING

From early May through mid-August, we captured, uniquely color-banded, and subsequently monitored adult, nestling, and fledged willow flycatchers at the four life history study areas. Color-banding and monitoring were also conducted at all survey areas where resident willow flycatchers were detected. These additional monitoring sites were the Beaver Dam Wash/Virgin River confluence at Littlefield, the Muddy River Delta at the Overton Wildlife Management Area, river mile 274 along the Colorado River in Grand Canyon, and the Bill Williams National Wildlife Refuge. Color-banding effort was also expanded to include Key Pittman Wildlife Management Area (WMA) in Nevada and lands along the Virgin River near Mesquite. Field personnel from unrelated willow flycatcher projects were surveying and/or monitoring flycatchers in these areas and provided us with the locations of nests and territorial flycatchers. Banding was conducted opportunistically at both areas.

For the second consecutive year, we conducted color-banding studies from 10–30 June along the extreme southern stretches of the lower Colorado River. In 2004, banding studies were conducted along the Colorado River from Martinez Lake south to the Gila River, along the Gila River, and along the Colorado River from its confluence with the Gila River south to the Mexico border. In conjunction with subsequent surveys and resighting at these sites through late July, these additional studies were conducted to better determine flycatcher residency, breeding status, and movement patterns in this area. Banding efforts at all sites were primarily dependent upon the presence of vocal willow flycatchers.

Adult and fledgling flycatchers were captured using mist-nets, which provide the most effective technique for live-capture of adult songbirds (Ralph et al. 1993). We used a targeted capture technique (per Sogge et al. 2001), whereby a variety of conspecific vocalizations are broadcast from a CD player and remote speakers to lure territorial flycatchers into the nets. In addition, we used “passive netting,” whereby several mist-nets are erected and periodically checked, with no broadcast of conspecific vocalizations. We banded each adult and fledged willow flycatcher with a single anodized (colored), numbered U.S. federal aluminum band on one leg and a colored metal band on the other. We coordinated all color combinations with the Federal Bird Banding Laboratory and all other Southwestern Willow Flycatcher banding projects to minimize replication of color combinations. For each color-banded bird recaptured, we visually inspected the legs and noted any evidence of irritation or injury that may be related to the presence of leg bands. Color change and fading have been documented in Hughes’s celluloid-plastic leg bands, making resighting difficult under field conditions (Lindsey et al. 1995, USGS unpubl. data). For birds recaptured with faded and indistinguishable plastic bands, we replaced the bands with metal color-bands. All plastic bands removed were collected and the color-band combination, if recognizable, recorded along with the federal band number.

Nestlings were banded at 8 to 10 days of age when they were large enough to retain the leg bands, yet young enough that they would not prematurely fledge from the nest (Whitfield 1990, Paxton et al. 1997). Nestlings were banded only when the location of the nest was such that nest access and removal/replacement of the nestlings would not endanger the nest, nest plant, or nestlings. Nestlings were banded with a single anodized, numbered federal band, uniquely identifying each bird as a returning nestling in the event it returns in a subsequent year.

For each captured adult and fledged willow flycatcher, we recorded morphological measurements including culmen, tail, wing, mass, fat level, and molt onto standardized data forms (Appendix A). Sex was determined based on the presence of a cloacal protuberance in males or brood patch and/or egg(s) in the oviduct for females. Because physical breeding characteristics are not always present on captured individuals, flycatchers observed engaging in lengthy, primary song from high perches (male advertising song) prior to capture were sexed as male. Captured flycatchers lacking breeding characteristics and not observed engaging in male advertising song as noted above were sexed as unknown. Flycatchers with retained primary, secondary, and/or primary covert feathers (multiple aged remiges) were aged as second year adults, and those without (uniformly aged remiges) were aged as after second year (per Kenwood and Paxton 2001 and Koronkiewicz et al. 2002). Individuals in juvenile plumage (unworn flight feathers and body plumage with broad, buff colored, wing bars and fleshy gape) were aged as hatch year.

RESIGHTING

We determined the identity of a color-banded flycatcher by observing with binoculars, from a distance, the unique color combination on its legs. Typically, territories and active nests were focal areas for resighting, but entire sites were surveyed. Field personnel typically spent the early part of each morning color-banding, and then redirected their efforts to resighting as daylight increased and flycatchers became more difficult to capture. All banding, monitoring, and survey field personnel coordinated resighting efforts and recorded observations of color-banded and unbanded flycatchers onto standardized data forms (Appendix A). For resighted

flycatchers, we recorded color-band combinations, territory number, site, standardize confidence levels of the resight, and behavioral observations. Willow flycatchers detected for one week or longer, regardless of whether a possible mate was observed, were considered resident at a site. Resighted flycatchers observed engaging in lengthy, primary song from high perches (male advertising song) were sexed as male. Resighted flycatchers observed not engaging in male advertising song as noted above were sexed as unknown. All inactive territories were visited at least three times (each visit four days apart) before territory visits stopped. All territories were assigned a unique alphanumeric code and were plotted onto high-resolution aerial photographs, thus producing a spatial representation of the flycatcher population at each study location. Flycatchers were determined to be unpaired if none of the following breeding behaviors were observed: presence of another unchallenged flycatcher in the immediate vicinity, counter calling (*whitts*) with a nearby flycatcher, interaction twitter calls (*churr/kitters*) with a nearby flycatcher, a flycatcher in the immediate vicinity carrying nesting material, a flycatcher in the immediate vicinity carrying food or fecal sac, or adult flycatchers feeding young (per Sogge et al. 1997).

Unbanded flycatchers could not be identified to individual, but an unbanded flycatcher detected in a given location on multiple, consecutive visits was assumed to be the same individual. If an unbanded flycatcher was detected at a given location on multiple visits but one or more intervening visits failed to detect a flycatcher, the detections were considered to be different individuals.

RESULTS

ALL MONITORING SITES

Color-Banding and Resighting – Field personnel color-banded 57 new adult flycatchers and recaptured 16 individuals banded in previous years, not including individuals banded as juveniles in 2003. An additional 31 adults banded in previous years were resighted, of which 24 (77%) could be identified to individual. Of the 24, 2 were banded as juveniles in 2003. We banded 81 nestlings from 35 nests and captured eight fledglings (three from a nest that was never located, two from a nest too high to reach, and three that had previously been banded as nestlings). Of the 81 nestlings banded, 9 were known to have died before fledging. Eleven individuals originally banded as juveniles in 2003 were detected, with nine (82%) identified to individual via recapture or resighting. Overall, 58% of the adult flycatchers detected at the monitoring sites were color-banded by the end of the breeding season (Table 3.1). For 38 adult flycatchers detected, we were unable to determine if these individuals were color-banded (that is, banding status was undetermined). Thus, the percentage of color-banded adult flycatchers at sites is a conservative estimate. For details on all flycatchers detected at the study areas from 2003 to 2004 see Appendix C.

Table 3.1. Summary of Willow Flycatchers Detected at Monitored Sites during the 2004 Breeding Season*

Study Area	Site	Adults								Nestlings Banded (# Nests)	Fledglings Captured	% of All Adults Banded
		Total Adults Detected	New Captured	Recaptured		Resighted (color combinations confirmed)	Unbanded	Band Status Undetermined	Banded ¹ (color combinations unconfirmed)			
				Not including 2003 Nestlings	2003 Nestlings							
Pahrana gat	North	32	16	7	1	0	4	1	3	25 (10)	2 ¹	84
	South	3	2	1	0	0	0	0	0	0	3 ²	100
	Study Area Total	35	18	8	1	0	4	1	3	25 (10)	5	86
Littlefield	North	3	1	0	2	0	0	0	0	2 (1)	0	100
Mesquite	West	30	7	7	2	10 ³	2	0	2	12 (5)	2 ⁴	93
Mormon Mesa	North	4	0	0	0	1	2	0	1	3 (1)	0	50
	Virgin River #1 North	15	8	0	1	1 ³	2	3	0	3 (2)	0	73
	Delta West	5	3	0	0	0	1	1	0	2 (1)	0	60
	Mormon Mesa South	3	0	0	0	0	1	2	0	0	0	0
	Study Area Total	27	11	0	1	2	6	6	1	8 (4)	0	59
Muddy River	Overton WMA	4	1	0	0	0	0	3	0	0	0	25
Grand Canyon	RM 274.5	2	2	0	0	0	0	0	0	3 (1)	0	100
	Burnt Springs	1	0	0	0	0	1	0	0	0	0	0
	Study Area Total	3	2	0	0	0	1	0	0	3 (1)	0	67
Topock	Pipes 1	1	0	0	0	0	0	1	0	0	0	0
	Pipes 3	5	2	0	0	0	1	2	0	2 (1)	1 ⁴	40
	PC6-1	9	1	0	1	0	7	0	0	2 (1)	0	22
	Pig Hole	2	1	0	0	0	1	0	0	1 (1)	0	50
	In Between	12	3	0	0	7	1	1	0	9 (3)	0	83
	800M	4	1	0	0	1	2	0	0	5 (2)	0	50
	Pierced Egg	5	1	0	0	1 ⁵	3	0	0	4 (2)	0	40
	Barbed Wire	1	0	0	0	0	1	0	0	0	0	0
	Swine Paradise	3	0	0	0	0	0	3	0	0	0	0
	Platform	1	0	0	0	0	1	0	0	0	0	0
	250M	2	1	0	0	0	1	0	0	1 (1)	0	50

Table 3.1. Summary of Willow Flycatchers Detected at Monitored Sites during the 2004 Breeding Season*, continued

Study Area	Site	Adults								Nestlings Banded (# Nests)	Fledglings Captured	% of All Adults Banded
		Total Adults Detected	New Captured	Recaptured		Resighted (color combinations confirmed)	Unbanded	Band Status Undetermined	Banded (color combinations unconfirmed)			
				Not including 2003 Nestlings	2003 Nestlings							
Topock	Hell Bird	9	3	1	0	1 ⁵	1	3	0	3 (1)	0	56
	Glory Hole	10	2	0	0	1	5	2	0	4 (2)	0	30
	South Dike Road ⁶	2	0	0	0	0	0	2	0	0	0	0
	Lost Lake	1	1	0	0	0	0	0	0	0	0	100
	Study Area Total	67	16	1	1	11	24	14	0	31 (14)	1	45
Bill Williams	Site 1	1	0	0	0	0	0	1	0	0	0	0
	Site 2	3	0	0	0	0	0	3	0	0	0	0
	Site 11	1	0	0	0	0	0	1	0	0	0	0
	Site 4	1	0	0	0	0	1	0	0	0	0	0
	Site 3	3	1	0	0	1	1	0	0	0	0	67
	Site 5	1	0	0	0	0	0	1	0	0	0	0
	Mineral Wash	1	0	0	0	0	0	1	0	0	0	0
	Beaver Pond	12	0	0	0	0	4	8	0	0	0	0
	Site 8	1	0	0	0	0	0	1	0	0	0	0
Study Area Total	24	1	0	0	1	6	16	0	0	0	0	8%
TOTAL	193	57	16	7	24	43	40	6	81 (35)	8	57%	

* Individuals are identified as new captures (previously unbanded), recaptures of previously banded birds, resightings of previously banded birds for which band combinations were confirmed, birds known to be unbanded, birds for which band status could not be determined, and resighting of previously banded birds for which band combinations were undetermined. Included are total numbers of adults detected and percent of all adults banded. For breeding and/or residency status of adults see Tables 3.2–3.15.

¹ Nest too high to band, young banded as fledglings.

² Nest never located, young banded as fledglings.

³ One individual color-banded as a fledgling in 2003.

⁴ Previously banded as a nestling.

⁵ Banded as a nestling in 2003.

⁶ Not a formal survey site, flycatcher detected en route.

SITE-BY-SITE COLOR-BANDING AND RESIGHTING

MONITORING SITES

Pahrnagat – We detected 29 resident, adult willow flycatchers (color-banded and unbanded) from 17 territories at Pahrnagat. In addition to resident adults, we detected six individuals, two of which were probably migrants, for which residency and/or breeding status could not be confirmed (Tables 3.2 and 3.3). Of the 17 territories recorded at Pahrnagat, 14 consisted of breeding individuals and 3 consisted of unpaired individuals. Of the breeding individuals, two males were polygynous. Field personnel captured and color-banded 18 new adults, and recaptured nine adult flycatchers banded in previous years, including one individual banded as a nestling in 2003. We banded 25 nestlings from 10 nests and 5 fledglings from 2 nests (3 from a nest that was never located, 2 from a nest too high to band). Of the resident adults, three remained unbanded, and banding status could not be confirmed for two. For the six adult individuals for which residency and/or breeding status could not be confirmed, one remained unbanded, and banding status could not be confirmed for two.

Table 3.2. Paired, Nestling, and Fledgling Willow Flycatchers Banded and Resighted at Pahrnagat, NV, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2}	Age ³	Sex ⁴	Territory	Observation Status ⁵
North	10-Aug-00	2370-39903	DD(M):XX	Rs:YY(P)	A6Y	F	1	R 12 Aug
North	INA	INA	banded	N/A	AHY	M	1	RS
North	12-Aug-04	2370-39902	XX:KY(M)	N/A	HY	U	1	N
North	12-Aug-04	2370-39904	YV(M):XX	N/A	HY	U	1	N
North	20-Jun-04	2320-31657	WO(M):EE	N/A	AHY	F	2	N
North	1-Jun-03	2320-31454	EE:DO(M)	EE:KR(M)	A3Y	M	2	R 18 May, 17 Jun
North	25-Jun-04	2320-31601	UB:EE	N/A	L	U	2	N
North	25-Jun-04	2320-31602	UB:EE	N/A	L	U	2	N
North	25-Jun-04	2320-31603	UB:EE	N/A	L	U	2	N
North	25-Jun-04	2320-31604	UB:EE	N/A	L	U	2	N
North	19-Jun-04	2320-31656	WD(M):EE	N/A	AHY	F	3	N
North	15-May-04	2320-31590	GR(M):EE	N/A	AHY	M	3, 74	N
North	22-Jun-04	2320-31665	UB:EE	N/A	L	U	3	N
North	22-Jun-04	2320-31666	UB:EE	N/A	L	U	3	N
North	22-Jun-04	2320-31667	UB:EE	N/A	L	U	3	N
North	1-Aug-04	2360-59721	UB:EE	N/A	L	U	3	N
North	1-Aug-04	2360-59723	UB:EE	N/A	L	U	3	N
North	1-Aug-04	2360-59724	UB:EE	N/A	L	U	3	N
South	6-Aug-04	2320-31669	ZK(M):EE	N/A	AHY	F	5	N

Table 3.2. Paired, Nestling, and Fledgling Willow Flycatchers Banded and Resighted at Pahranaagat, NV, in 2004, continued

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2}	Age ³	Sex ⁴	Territory	Observation Status ^{1,5}
South	17-May-03	3500-68971	XX:DD(M)	EE:KK(M) ⁶	A3Y	M	5	R 6 Aug
South	6-Aug-04	3500-68968	DW(M):XX	N/A	HY	U	5	N
South	6-Aug-04	3500-68969	XX:GG(M)	N/A	HY	U	5	N
South	6-Aug-04	3500-68972	GG(M):XX	N/A	HY	U	5	N
North	17-Jun-04	2320-31662	YY(M):EE	N/A	SY	F	6	N
North	14-May-04	2320-31589	EE:YD(M)	N/A	AHY	M	6	N, R 17 Jun
North	2-Jul-04	2320-31571	UB:EE	N/A	L	U	6	N
North	18-Jun-04	2320-31663	EE:GK(M)	N/A	AHY	F	10	N
North	28-May-03	2320-31453	EE:WW(M)	N/A	A3Y	M	10, 22	R 4 May
North	25-Jun-04	2320-31605	UB:EE	N/A	L	U	10	N
North	25-Jun-04	2320-31606	UB:EE	N/A	L	U	10	N
North	18-Jul-00	2140-66621 ⁷	WR(M):UB	Rs:KG(M)	A6Y	F	11	R 23 Jun
North	16-Jun-97	1590-97338	OG(M):XX	Rs:XX	A9Y	M	11	R 22 Jun
North	23-Jun-04	2320-31484	UB:EE	N/A	L	U	11	N
North	20-Jun-04	2320-31658	WK(M):EE	N/A	AHY	F	12	N
North	15-May-04	2320-31591	GY(M):EE	N/A	AHY	M	12	N, R 16 May
North	26-Jun-04	2320-31607	UB:EE	N/A	L	U	12	N
North	26-Jun-04	2320-31608	EE:UB	N/A	L	U	12	N
North	26-Jun-04	2320-31609	UB:EE	N/A	L	U	12	N
North	26-Jun-04	2320-31610	EE:UB	N/A	L	U	12	N
North	17-Jun-04	2320-31661	EE:DW(M)	N/A	SY	F	13	N
North	6-Aug-01	2320-31592	GO(M):EE	G(HP)/O(HP):Rs	4Y	M	13	R 17 May
North	29-Jun-04	2320-31446	UB:EE	N/A	L	U	13	N
North	29-Jun-04	2320-31448	UB:EE	N/A	L	U	13	N
North	2-Jul-04	2320-31568	YG(M):EE	N/A	AHY	F	14	N
North	18-May-04	2320-31594	EE:YO(M)	N/A	AHY	M	14	N
North	25-Jul-04	2320-31447	UB:EE	N/A	L	U	14	N
North	25-Jul-04	2320-31449	UB:EE	N/A	L	U	14	N
North	25-Jul-04	2320-31450	UB:EE	N/A	L	U	14	N
North	N/A	N/A	UB:UB	N/A	AHY	F	21	RS
North	18-May-04	2320-31593	EE:WV(M)	N/A	AHY	M	21	N
North	18-Jun-04	2320-31664	YW(M):EE	N/A	AHY	F	22	N
North	2-Jul-04	2320-31569	UB:EE	N/A	L	U	22	N
North	2-Jul-04	2320-31570	EE:UB	N/A	L	U	22	N
North	N/A	N/A	UB:UB	N/A	AHY	F	23	RS

Table 3.2. Paired, Nestling, and Fledgling Willow Flycatchers Banded and Resighted at Pahrnatag, NV, in 2004, continued

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2}	Age ³	Sex ⁴	Territory	Observation Status ^{1,5}
North	INA	INA	undetermined	INA	AHY	M	23	N/A
North	22-Jun-04	2320-31668	ZG(M):EE	N/A	AHY	F	74	N

¹ N/A = not applicable; INA = information not available.

² **Color-band codes:** D = dark/navy blue, EE = electric yellow federal band, G = green, (HP) = half plastic bands/bands cut to half the height of a full plastic band, K = black, (M) = metal pin striped band, O = orange, (P) = full plastic band, R = red, Rs = red federal band, UB = unbanded, V = violet, W = white, XX = silver federal band, Y = yellow, Z = gold, banded = bird has color-bands but combination undetermined, undetermined = presence of bands could not be determined. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** L = nestling, HY = hatch year, SY = 2 years, AHY = 2 years or older, 3Y = 3 years, A3Y = 3 years or older, 4Y = 4 years, A4Y = 4 years or older, etc.

⁴ **Sex codes:** F = female, M = male, U = sex unknown.

⁵ **Observation status codes:** N = new capture, R = recapture - followed by date recaptured, RS = resight.

⁶ Original federal band number: 2320-31451.

⁷ Federal band removed because of leg injury.

Table 3.3. Summary of Unpaired, Resident Willow Flycatchers and Individuals for which Residency and/or Breeding Status Could Not Be Confirmed, Pahrnatag, 2004

Site	Date banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ¹	Age ³	Sex ⁴	Location ⁵	Observation Status ⁶
North	25-Jun-03	2320-31459	EE:DK(M)	EE:UB	SY	M	T9	R 23 Jun, unpaired, detected 7–27 June
North	19-May-04	2320-31596	EE:YG(M)	N/A	SY	M	T15	N, unpaired, detected 16 May–11 Jun
North	N/A	N/A	UB:UB	N/A	AHY	M	T30	RS; unpaired, detected 23–29 July
North	18-May-04	2320-31595	GV(M):EE	N/A	AHY	U	F4	N; not detected post-capture, suspected migrant
North	N/A	N/A	UB:UB	N/A	AHY	M	F7	RS; detected 8 Jun
North	INA	INA	banded	N/A	AHY	U	F19	RS; detected 9 Jun
North	INA	INA	banded	N/A	AHY	M	F31	RS, detected 18–20 Jun
North	12-Aug-04	2370-39901	OO(M):XX	N/A	AHY	U	F32	N, not detected post-capture, suspected migrant
North	14-Jul-01	2320-31597 ⁷	EE:UB	KK(M):XX	A5Y	M	F35	R 20 May, not detected post-capture

¹ N/A = not applicable; INA = information not available.

² **Color-band codes:** D = dark/navy blue, EE = electric yellow federal band, G = green, (HP) = half plastic bands/bands cut to half the height of a full plastic band, K = black, (M) = metal pin striped band, O = orange, (P) = full plastic band, R = red, Rs = red federal band, UB = unbanded, V = violet, W = white, XX = silver federal band, Y = yellow, Z = gold, banded = bird has color-bands but combination undetermined. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** SY = 2 years, AHY = 2 years or older, A5Y = 5 years or older.

⁴ **Sex codes:** M = male, U = sex unknown.

⁵ **Location Codes:** T = territorial individual detected for at least 7 days, F = individual detected for less than 7 days.

⁶ **Observation status codes:** N = new capture, R = recapture - followed by date recaptured, RS = resight.

⁷ Original federal band (2190-76604) was removed because of leg injury.

Littlefield – We detected three resident, adult willow flycatchers from two territories at Littlefield, consisting of a breeding pair and an unpaired individual. Field personnel captured and color-banded one new adult and recaptured two individuals banded as nestlings in 2003. We banded two nestlings from a single nest (Table 3.4 and 3.5).

Mesquite – We detected 28 resident, adult willow flycatchers (color-banded and unbanded) from 16 territories at Mesquite. In addition to resident adults, we detected two individuals for which residency and/or breeding status could not be confirmed (Table 3.6 and 3.7). Of the 16 territories recorded at Mesquite, 12 consisted of breeding individuals and four consisted of unpaired individuals. Field personnel captured and color-banded seven new adults, and recaptured nine adult flycatchers, including two individuals originally banded as nestlings in 2003. We resighted 10 other returning banded individuals, one of which was banded as a fledgling in 2003. We banded 12 nestlings from five nests and captured two 2004 fledglings previously banded as nestlings.⁹ Of the resident adults, one remained unbanded, and banding status could not be confirmed for two. Residency and/or breeding status could not be confirmed for an unbanded individual.

Mormon Mesa – We detected 14 resident, adult willow flycatchers (color-banded and unbanded) from seven territories at Mormon Mesa, with all territories composed of paired individuals. In addition to resident adults, we detected 13 individuals, 4 of which were most likely migrants, for which residency and/or breeding status could not be confirmed (Table 3.8 and 3.9). Field personnel captured and color-banded 11 new adults and recaptured an individual originally banded as a nestling in 2003. We resighted two other returning banded individuals, one of which was banded as a fledgling in 2003. We banded eight nestlings from four nests. Of the resident adults, two remained unbanded, and banding status could not be confirmed for three. For migrants and individuals for which residency and/or breeding status could not be confirmed, four remained unbanded, and four individuals of were of unknown band status.

Muddy River – We detected one resident, adult willow flycatcher and three individuals for which residency and/or breeding status could not be determined on the Muddy River Delta. Field personnel captured one new adult, and three individuals had undetermined band status (Table 3.10).

Grand Canyon – At River Mile 274.5 we detected a single, breeding pair that was captured and color-banded. Three nestlings were banded from a single nest (Table 3.11). We also detected an unbanded resident at Burnt Springs Canyon (Table 3.12).

⁹ Individuals banded as nestlings and later captured as 2004 fledglings and provided with a second colored metal band are not included in the total of nestlings banded.

Table 3.4. Breeding and Nestling Willow Flycatchers Banded at Littlefield, AZ, in 2004

Site	Date Banded	Federal Band #	Color Combination ¹	Old Color Combination ^{2,3}	Age 2004 ⁴	Sex ⁵	Territory	Observation Status ⁶
North	23-Jul-03	2320-31486	YV(M):EE	UB:EE	SY	F	1	R 29 Jul
North	3-Jun-04	2320-31490	EE:OO(M)	N/A	AHY	M	1	N
North	29-Jul-04	2360-59760	UB:EE	N/A	L	U	1	N
North	29-Jul-04	2360-59761	UB:EE	N/A	L	U	1	N

¹ **Color-band codes:** EE = electric yellow federal band, (M) = metal pin striped band, O = orange, UB = unbanded, V = violet, Y = yellow.

Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

² N/A = not applicable.

³ Old combination included only if rebanded in 2004.

⁴ **Age codes:** L = nestling, SY = 2 years, AHY = 2 years or older.

⁵ **Sex codes:** F = female, M = male, U = sex unknown.

⁶ **Observation status codes:** N = new capture, R = recapture - followed by date recaptured.

Table 3.5. Unpaired, Resident Willow Flycatchers at Littlefield, AZ, in 2004

Site	Date Banded	Federal Band #	Color Combination ¹	Old Color Combination ^{1,2}	Age ³	Sex ⁴	Location ⁵	Observation Status ⁶
North	1-Jul-03	2320-31475	EE:WR(M)	EE:UB	SY	M	T2	R 2 Jul; unpaired male detected 22 Jun–23 Jul

¹ **Color-band codes:** EE = electric yellow federal band, (M) = metal pin striped band, R = red, UB = unbanded, W = white.

Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

² Old combination included only if rebanded in 2004.

³ **Age in 2004:** SY = 2 years.

⁴ **Sex codes:** M = male.

⁵ **Location Code:** T = territorial individual detected for at least 7 days.

⁶ **Observation status codes:** R = recapture - followed by date recaptured.

Table 3.6. Paired, Nestling, and Fledgling Willow Flycatchers Banded and Resighted at Mesquite, NV, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2,3}	Age ⁴	Sex ⁵	Territory	Observation status ⁶
West	1-Aug-03	2320-31445	EE:WK(M)	N/A	A3Y	F	1	R 27 Jun
West	4-Aug-00	2320-31614 ⁷	VY(M):EE	VG(M):Bs	5Y	M	1	R 27 Jun
West	6-Jul-04	2320-31573	WY(M):EE	N/A	AHY	F	2	N
West	3-Jul-04	2320-31622	VK(M):EE	N/A	AHY	M	2	N
West	INA	INA	banded	N/A	AHY	F	3	RS
West	31-Jul-02	2110-78842	OB(P):BEs	N/A	A4Y	M	3	RS
West	INA	INA	banded:EE ⁸	N/A	AHY	F	5	RS
West	4-Jul-01	2390-92434	UB:XX	G(HP)/O(HP):XX	4Y	M	5	R 23 May
West	2-Jul-99	2390-92451	KW(M):XX	UB:XX ⁹	6Y	F	8	R 3 Jul
West	5-Jul-03	2320-31438	RK(M):EE	N/A	SY	M	8	RS
West	8-Jul-04	2320-31616	EE:UB	N/A	L	U	8	N
West	8-Jul-04	2320-31617	UB:EE	N/A	L	U	8	N
West	8-Jul-04	2320-31618	EE:UB	N/A	L	U	8	N
West	29-Jun-03	2320-31471	EE:OW(M)	EE:UB	SY	F	9	R 11 Jun
West	N/A	N/A	UB:UB	N/A	AHY	M	9	RS
West	14-Jun-04	2320-31655	VW(M):EE	N/A	SY	F	12	N
West	18-Jul-04	2360-59717	RY(M):EE	N/A	AHY	M	12	N
West	16-Jul-04	2320-31633	UB:EE	N/A	L	U	12	N
West	16-Jul-04	2320-31634	UB:EE	N/A	L	U	12	N
West	26-Jun-03	2320-31479	GG(M):EE	N/A	3Y	F	21	RS
West	27-Jun-01	2390-92421	XX:WR(M)	N/A	4Y	M	21	RS
West	27-Jun-03	2320-31480	WR(M):EE	UB:EE	SY	F	22	R 1 Jul
West	22-Jul-02	2140-66709	Bs:GW(M)	N/A	A4Y	M	22	RS
West	24-Jul-01	2390-92470	KR(M):XX	B(HP)/G(HP):XX	4Y	F	31	R 17 Jun
West	17-May-00	2390-92350	XX:DY(M)	XX:YR(P)	A6Y	M	31	R 17 Jun, 29 Jun
West	21-Jun-04	2320-31660	UB:EE	N/A	L	U	31	N
West	21-Jun-04	2320-31483	RR(M):EE	UB:EE	HY	U	31	N, R 8 Jul
West	21-Jun-04	2320-31615	EE:OY(M)	UB:EE	HY	U	31	N, R 8 Jul
West	24-Jul-02	2320-31613 ¹⁰	DR(M):EE	O(HP)/Y(HP):Zs	A4Y	F	32	R 27 Jun
West	6-Jul-02	2110-78861	BEs:VK(M)	N/A	3Y	M	32	RS

Table 3.6. Paired, Nestling, and Fledgling Willow Flycatchers Banded and Resighted at Mesquite, NV, in 2004, continued

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2,3}	Age ⁴	Sex ⁵	Territory	Observation status ⁶
West	7-Aug-04	2360-59762	EE:UB	N/A	L	U	32	N
West	7-Aug-04	2360-59763	EE:UB	N/A	L	U	32	N
West	7-Aug-04	2360-59766	EE:UB	N/A	L	U	32	N
West	31-Jul-03	2320-31444	RW(M):EE	N/A	A3Y	F	62	RS
West	26-Jul-01	2390-92475	XX:WY(M)	N/A	4Y	M	62	RS
West	25-Jun-04	2320-31500	EE:UB	N/A	L	U	62	N
West	25-Jun-04	2320-31611	EE:UB	N/A	L	U	62	N
West	25-Jun-04	2320-31612	EE:UB	N/A	L	U	62	N

¹ N/A = not applicable; INA = information not available.

² **Color-band codes:** B = light blue, BEs = berry federal band, Bs = blue federal band, D = dark/navy blue, EE = electric yellow federal band, G = green, (HP) = half plastic bands/bands cut to half the height of a full plastic band, K = black, (M) = metal pin striped band, O = orange, (P) = full plastic band, R = red, UB = unbanded, V = violet, W = white, XX = silver federal band, Y = yellow, Zs = gold federal band, banded = bird has color-bands but combination undetermined.

Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ Old combination included only if rebanded in 2004.

⁴ **Age in 2004:** L = nestling, HY = hatch year, SY = 2 years, AHY = 2 years or older, 3Y = 3 years, A3Y = 3 years or older, 4Y = 4 years, A4Y = 4 years or older, etc.

⁵ **Sex codes:** F = female, M = male, U = sex unknown.

⁶ **Observation status codes:** N = new capture, R = recapture - followed by date recaptured, RS = resight.

⁷ Original federal band number: 2140-66775.

⁸ Color combination could not be determined due to a leg injury masking the band.

⁹ Originally banded Y(HP)/R(HP):XX but recaptured without color-bands.

¹⁰ Original federal band number: 2140-66517.

Table 3.7. Summary of Unpaired, Resident Willow Flycatchers and Individuals for which Residency and/or Breeding Status Could Not Be Confirmed, Mesquite, NV, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color combination ²	Age ³	Sex ⁴	Location ⁵	Observation status ⁶
West	4-Jul-01	2390-92433	XX:ZR(M)	4Y	M	T4	RS, unpaired, detected 7 May–27 Jul
West	5-Jun-04	2320-31551	EE:GO(M)	AHY	M	T6	N, unpaired, detected 3–25 Jun
West	7-Jul-00	2390-92365	RG(M):XX	5Y	M	T11	RS; unpaired, detected 15 May–29 Jul
West	5-Jul-04	2320-31627	WW(M):EE	SY	M	T41	N, unpaired, detected 3–13 Jul
West	N/A	N/A	UB:UB	AHY	U	F7	RS; detected 4 Jul
West	25-Jun-04	2320-31499	KO(M):EE	SY	M	F33	N, unpaired, detected 25 Jun, resighted at T4 on 2 Jul

¹ N/A = not applicable.

² **Color-band codes:** EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, O = orange, R = red, UB = unbanded, W = white, XX = silver federal band, Z = gold. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** SY = 2 years, AHY = 2 years or older, 4Y = 4 years, 5Y = 5 years.

⁴ **Sex codes:** M = male, U = sex unknown.

⁵ **Location Codes:** T = territorial individual detected for at least 7 days, F = individual detected for less than 7 days.

⁶ **Observation status codes:** N = new capture, RS = resight.

Table 3.8. Paired and Nestling Willow Flycatchers Banded and Resighted at Mormon Mesa, NV, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Age ³	Sex ⁴	Territory	Observation Status ^{1,5}
North	N/A	N/A	UB:UB	AHY	F	1	RS
North	1-Jul-98	1710-20638	YR(M):XX	A8Y	M	1	RS
North	23-Jun-04	2320-31496	UB:EE	L	U	1	N
North	23-Jun-04	2320-31497	UB:EE	L	U	1	N
North	23-Jun-04	2320-31498	UB:EE	L	U	1	N
Delta West	INA	INA	undetermined	AHY	F	2	N/A
Delta West	21-May-04	2320-31651	EE:OD(M)	AHY	M	2	N

Table 3.8. Paired and Nestling Willow Flycatchers Banded and Resighted at Mormon Mesa, NV, in 2004, continued

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Age ³	Sex ⁴	Territory	Observation Status ^{1,5}
Virgin River #1 North	30-Jun-04	2320-31621	VV(M):EE	AHY	F	4	N
Virgin River #1 North	N/A	N/A	UB:UB	AHY	M	4	RS
Virgin River #1 North	10-Jul-04	2320-31619	UB:EE	L	U	4	N
Virgin River #1 North	10-Jul-04	2320-31620	UB:EE	L	U	4	N
Virgin River #1 North	2-Aug-03	2320-31440	OY(M):EE	SY	F	5	RS
Virgin River #1 North	7-Jun-04	2320-31552	EE:GR(M)	AHY	M	5	N
Virgin River #1 North	INA	INA	undetermined ⁶	AHY	F	10	N/A
Virgin River #1 North	INA	INA	undetermined ⁶	AHY	M	10	N/A
Virgin River #1 North	30-Jun-04	2320-31485	EE:WO(M)	AHY	F	32	N
Virgin River #1 North	4-Jul-04	2320-31572	YK(M):EE	SY	M	32	N
Virgin River #1 North	6-Jul-04	2320-31629	UB:EE	L	U	32	N
Delta West	4-Jul-04	2320-31625	EE:WG(M)	AHY	F	35	N
Delta West	27-May-04	2320-31653	WV(M):EE	SY	M	35	N
Delta West	4-Jul-04	2320-31623	UB:EE	L	U	35	N
Delta West	4-Jul-04	2320-31624	UB:EE	L	U	35	N

¹ N/A = not applicable, INA = information not available.

² **Color-band codes:** D = dark/navy blue, EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, O = orange, R = red, UB = unbanded, V = violet, W = white, XX = silver federal band, Y = yellow, undetermined = presence of bands could not be determined.

Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** L = nestling, SY = 2 years old, AHY = 2 years or older, A8Y = 8 years or older.

⁴ **Sex codes:** F = female, M = male, U = sex unknown.

⁵ **Observation status codes:** N = new capture, RS = resight.

⁶ One bird of pair is banded, other is unbanded.

Table 3.9. Summary of Unpaired, Resident Willow Flycatchers and Individuals for which Residency and/or Breeding Status Could Not Be Confirmed, Mormon Mesa, NV, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old color Combination ^{1,2,3}	Age ⁴	Sex ⁵	Location ⁶	Observation Status ⁷
Delta West	N/A	N/A	UB:UB	N/A	AHY	M	F3	RS, unpaired, detected 6-10 Jun
North	INA	INA	banded	N/A	AHY	U	F20	RS, detected 26–27 May
Mormon Mesa South	INA	INA	undetermined	N/A	AHY	U	F22	Detected 23 Jun
Mormon Mesa South	INA	INA	undetermined	N/A	AHY	U	F23	Detected 8 Jun, suspected migrant
North	N/A	N/A	UB:UB	N/A	AHY	U	F30	RS, detected 18 May, suspected migrant
Virgin River #1 North	INA	INA	undetermined	N/A	AHY	U	F31	Detected 18 May, suspected migrant
Virgin River #1 North	N/A	N/A	UB:UB	N/A	AHY	U	F33	RS, detected 19–25 May
Mormon Mesa South	N/A	N/A	UB:UB	N/A	AHY	M	F34	RS, detected 19 May, suspected migrant
Virgin River #1 North	6-Jul-04	2320-31628	EE:KZ(M)	N/A	SY	U	F36	N, captured in territory 5, not detected post capture
Virgin River #1 North	22-May-04	2320-31652	WG(M):EE	N/A	AHY	U	F61	N, detected 19–22 May
Virgin River #1 North	7-Jun-04	2320-31553	EE:GW(M)	N/A	SY	U	F62	N, captured in territory 5, not detected post capture
Virgin River #1 North	27-May-04	2320-31489	EE:OK(M)	N/A	AHY	U	F63	N, captured in territory 32, not detected post capture
Virgin River #1 North	12-Jun-03	2320-31428	EE:GZ(M)	EE:UB	SY	U	F64	R 4 Jul, captured in territory 32, not detected post capture

¹ N/A = not applicable; INA = information not available.

² **Color-band codes:** EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, O = orange, UB = unbanded, W = white, Z = gold, banded = bird has color-bands but combination undetermined, undetermined = presence of bands could not be determined. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ Old combination included only if rebanded in 2004.

⁴ **Age in 2004:** SY = 2 years, AHY = 2 years or older.

⁵ **Sex codes:** M = male, U = sex unknown.

⁶ **Location code:** F = individual detected for less than 7 days.

⁷ **Observation status codes:** N = new capture, R = recapture - followed by date recaptured, RS = resight.

Table 3.10. Summary of Unpaired Willow Flycatchers at the Muddy River Delta, NV, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Age ³	Sex ⁴	Location ⁵	Observation Status ⁶
Overton WMA	9-Jun-04	2320-31493	DO(M):EE	AHY	M	T1	N, unpaired, detected 20 May–11 Jun
Overton WMA	INA	INA	undetermined	AHY	U	F2	Detected 2–7 Jun
Overton WMA	INA	INA	undetermined	AHY	U	F3	Detected 12 July
Overton WMA	N/A	N/A	undetermined	AHY	U	F4	Detected 7–9 Jun

¹ INA = information not available.

² **Color-band codes:** D = dark/navy blue, EE = electric yellow federal band, (M) = metal pin striped band, O = orange, undetermined = presence of bands could not be determined. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** AHY = 2 years or older.

⁴ **Sex codes:** M = male, U = sex unknown.

⁵ **Location codes:** T territorial individual detected for at least 7 days, F = individual detected for less than 7 days.

⁶ **Observation status codes:** N = new capture.

Table 3.11. Breeding and Nestling Willow Flycatchers Banded at Grand Canyon, AZ, in 2004

Site	Date Banded	Federal Band #	Color Combination ¹	Age ²	Sex ³	Territory	Observation Status ⁴
RM 274.5	15-Jul-04	2320-31516	EE:RD(M)	SY	F	90	N
RM 274.5	15-Jul-04	2320-31517	EE:OR(M)	SY	M	90	N
RM 274.5	17-Jul-04	2360-59746	UB:EE	L	U	90	N
RM 274.5	17-Jul-04	2360-59771	UB:EE	L	U	90	N
RM 274.5	17-Jul-04	2360-59800	UB:EE	L	U	90	N

¹ **Color-band codes:** D = dark/navy blue, EE = electric yellow federal band, (M) = metal pin striped band, O = orange, R = red, UB = unbanded. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

² **Age in 2004:** L = nestling, SY = 2 years.

³ **Sex codes:** F = female, M = male, U = sex unknown.

⁴ **Observation status codes:** N = new capture.

Table 3.12. Willow Flycatchers for which Residency and/or Breeding Status Could Not Be Confirmed, Grand Canyon, AZ, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Age ³	Sex ⁴	Location ⁵	Observation Status ⁶
Burnt Springs	N/A	N/A	UB:UB	AHY	U	T91	RS, detected 8–24 June

¹ N/A = not applicable.

² **Color-band codes:** UB = unbanded. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** AHY = 2 years or more.

⁴ **Sex codes:** U = sex unknown.

⁵ **Location Code:** T = territorial individual detected for at least 7 days.

⁶ **Observation status codes:** RS = resight.

Topock – We detected 57 resident, adult willow flycatchers (color-banded and unbanded) from 34 territories at Topock. In addition to resident adults, we detected 10 individuals, 5 of which were most likely migrants, for which residency and/or breeding status could not be confirmed (Table 3.13 and 3.14). Of the 34 territories recorded at Topock, 29 consisted of paired individuals and 5 consisted of unpaired individuals. Of the breeding individuals, six males were polygynous. Field personnel captured and color-banded 16 new adults; recaptured 2 adult flycatchers, 1 of which was originally banded as nestling in 2003; and resighted 11 other returning banded individuals, 2 of which were originally banded as nestlings in 2003. We banded 31 nestlings from 14 nests and recaptured a 2004 fledgling that had been banded in the nest. Of the resident adults, 21 remained unbanded, and banding status could not be confirmed for 9 individuals. For migrants and individuals for which residency and/or breeding status could not be confirmed, three remained unbanded, and four were of unknown band status.

Bill Williams – We detected three resident willow flycatchers (color-banded and unbanded) from three territories at Bill Williams, all of which were composed of unpaired individuals. In addition to resident adults, we detected 21 individuals that were most likely migrants (Table 3.15). Field personnel captured and color-banded one new adult and resighted a returning individual. Banding status was undetermined for one resident. Of the migrants, 6 were unbanded, and band status for 15 could not be determined.

NON-MONITORING SITES

Key Pittman Wildlife Management Area – Field personnel captured and color-banded two new adults, recaptured an individual banded as a nestling in 2003, and banded six nestlings from three nests (Table 3.16).

Virgin River near Mesquite – Field personnel captured and color-banded four new adults and recaptured two adult flycatchers banded in previous years. Of the two recaptured adults, one was banded as a nestling in 2003 and the other was banded as a nestling in 2002 and not detected in 2003 (Table 3.17).

Table 3.13. Paired and Nestling Willow Flycatchers Banded and Resighted at Topock, Havasu NWR, AZ, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2,3}	Age ⁴	Sex ⁵	Territory	Observation Status ^{1,6}
In Between	8-Jul-02	2110-78841	B(HP)/Y(HP):BEs	N/A	3Y	F	1	RS
In Between	19-May-03	2320-31576	KK(M):EE	N/A	A3Y	M	1, 73	RS
In Between	30-Jul-04	2320-31557	EE:UB	N/A	L	U	1	N
In Between	30-Jul-04	2320-31558	UB:EE	N/A	L	U	1	N
In Between	25-Jun-04	2320-31564	EE:UB	N/A	L	U	1	N
In Between	25-Jul-98	2390-92348	YY(P):XX	N/A	7Y	F	2	RS
In Between	3-Jun-04	2320-31538	EE:YR(M)	N/A	AHY	M	2, 22	N
In Between	1-Jun-03	2320-31577	GW(M):EE	N/A	A3Y	F	5	RS
In Between	17-May-04	2320-31414	RG(M):EE	N/A	AHY	M	5, 7	N
In Between	22-Jun-04	2320-31554	UB:EE	N/A	L	U	5	N
In Between	22-Jun-04	2320-31555	EE:UB	N/A	L	U	5	N
In Between	22-Jun-04	2320-31556	UB:EE	N/A	L	U	5	N
PC6-1	N/A	N/A	UB:UB	N/A	AHY	F	6	RS
PC6-1	N/A	N/A	UB:UB	N/A	AHY	M	6	RS
In Between	28-May-03	2320-31502	ZR(M):EE	N/A	A3Y	F	7	RS
PC6-1	8-Jul-04	2320-31515	EE:WY(M)	N/A	SY	F	8	N
PC6-1	N/A	N/A	UB:UB	N/A	AHY	M	8	RS
PC6-1	29-Jun-03	2320-31407	ZO(M):EE	UB:EE	SY	F	9	R 10 Jul
PC6-1	N/A	N/A	UB:UB	N/A	AHY	M	9	RS
PC6-1	16-Jul-04	2320-31510	UB:EE	N/A	L	U	9	N
PC6-1	16-Jul-04	2320-31511	UB:EE	N/A	L	U	9	N
Glory Hole	N/A	N/A	UB:UB	N/A	AHY	F	11	RS
Glory Hole	6-Jul-02	2110-78863	R(HP)/V(HP):BEs	N/A	3Y	M	11, 47	RS
Pierced Egg	6-Jun-04	2320-31415	OZ(M):EE	N/A	AHY	F	15	N
Pierced Egg	N/A	N/A	UB:UB	N/A	AHY	M	15	RS
Pierced Egg	5-Jul-04	2320-31421	UB:EE	N/A	L	U	15	N

Table 3.13. Paired and Nestling Willow Flycatchers Banded and Resighted at Topock, Havasu NWR, AZ, in 2004, continued

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2,3}	Age ⁴	Sex ⁵	Territory	Observation Status ^{1,6}
Pierced Egg	5-Jul-04	2320-31422	UB:EE	N/A	L	U	15	N
PC6-1	N/A	N/A	UB:UB	N/A	AHY	F	16	RS
PC6-1	N/A	N/A	UB:UB	N/A	AHY	M	16	RS
Hell Bird	N/A	N/A	UB:UB	N/A	AHY	F	18	RS
Hell Bird	INA	INA	undetermined	INA	AHY	M	18	N/A
800M	23-Jun-04	2320-31565	EE:KD(M)	N/A	AHY	F	20	N
800M	N/A	N/A	UB:UB	N/A	AHY	M	20	RS
800M	16-Jun-04	2320-31416	UB:EE	N/A	L	U	20	N
800M	16-Jun-04	2320-31417	UB:EE	N/A	L	U	20	N
In Between	6-Aug-04	2320-31521	EE:DY(M)	N/A	SY	F	22	N
In Between	2-Aug-04	2320-31542	UB:EE	N/A	L	U	22	N
In Between	2-Aug-04	2320-31543	UB:EE	N/A	L	U	22	N
In Between	2-Aug-04	2320-31544	EE:UB	N/A	L	U	22	N
Pipes 3	N/A	N/A	UB:UB	N/A	AHY	F	23	RS
Pipes 3	22-Jun-04	2320-31541	EE:KW(M)	N/A	SY	M	23, 24	N
Pipes 3	22-Jul-04	2320-31561	EE:UB	N/A	L	U	23	N
Pipes 3	22-Jul-04	2320-31562	KY(M):EE	UB:EE	HY	U	23	N, R 8 Aug
Pipes 3	22-Jul-04	2320-31563	EE:UB	N/A	L	U	23	N
Pipes 3	22-Jun-04	2320-31540	EE:KR(M)	N/A	SY	F	24	N
Pipes 3	INA	INA	undetermined	INA	AHY	F	25	N/A
Pipes 3	INA	INA	undetermined	INA	AHY	M	25	N/A
In Between	INA	INA	undetermined	INA	AHY	F	34	N/A
In Between	8-Jul-01	2140-66728	Bs:NN(P)	N/A	4Y	M	34, 72	RS
Hell Bird	INA	INA	UB:EE	N/A	SY	F	40	RS
Hell Bird	7-Jul-99	2140-66743	OG(M):Bs	VW(P):Bs	6Y	M	40	R 18 May
Hell Bird	7-Jul-04	2320-31424	EE:UB	N/A	L	U	40	N

Table 3.13. Paired and Nestling Willow Flycatchers Banded and Resighted at Topock, Havasu NWR, AZ, in 2004, continued

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2,3}	Age ⁴	Sex ⁵	Territory	Observation Status ^{1,6}
Hell Bird	7-Jul-04	2320-31425	EE:UB	N/A	L	U	40	N
Hell Bird	7-Jul-04	3500-68963	XX:UB	N/A	L	U	40	N
Pig Hole	N/A	N/A	UB:UB	N/A	AHY	F	41	RS
Pig Hole	28-May-04	2320-31598	DK(M):EE	N/A	AHY	M	41	N, R 29 Jun
Pig Hole	17-Jul-04	2320-31508	UB:EE	N/A	L	U	41	N
Pierced Egg	INA	INA	UB:EE	N/A	SY	F	42	RS
Pierced Egg	N/A	N/A	UB:UB	N/A	AHY	M	42	RS
Pierced Egg	4-Jul-04	2320-31419	UB:EE	N/A	L	U	42	N
Pierced Egg	4-Jul-04	2320-31420	UB:EE	N/A	L	U	42	N
Glory Hole	N/A	N/A	UB:UB	N/A	AHY	F	44	RS
Glory Hole	1-Jul-04	2320-31505	EE:DR(M)	N/A	SY	M	44	N
Glory Hole	22-Jul-04	2320-31506	UB:EE	N/A	L	U	44	N
Glory Hole	22-Jul-04	2320-31507	UB:EE	N/A	L	U	44	N
Glory Hole	N/A	N/A	UB:UB	N/A	AHY	F	45	RS
Glory Hole	1-Jul-04	2320-31567	YD(M):EE	N/A	SY	M	45	N
Glory Hole	16-Jul-04	2320-31513	UB:EE	N/A	L	U	45	N
Glory Hole	16-Jul-04	2320-31514	UB:EE	N/A	L	U	45	N
Glory Hole	N/A	N/A	UB:UB	N/A	AHY	F	47	RS
800M	2-Jun-03	2320-31526	OD(M):EE	N/A	A3Y	F	49	RS
800M	N/A	N/A	UB:UB	N/A	AHY	M	49	RS
800M	30-Jul-04	2320-31518	UB:EE	N/A	L	U	49	N
800M	30-Jul-04	2320-31519	UB:EE	N/A	L	U	49	N
800M	30-Jul-04	2320-31520	UB:EE	N/A	L	U	49	N
In Between	N/A	N/A	UB:UB	N/A	AHY	F	72	RS
In Between	3-Jul-03	2320-31584	EE:YK(M)	N/A	3Y	F	73	RS
250M	N/A	N/A	UB:UB	N/A	AHY	F	74	RS

Table 3.13. Paired and Nestling Willow Flycatchers Banded and Resighted at Topock, Havasu NWR, AZ, in 2004, continued

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Old Color Combination ^{1,2,3}	Age ⁴	Sex ⁵	Territory	Observation Status ^{1,6}
250M	17-Jun-04	2320-31418	EE:RR(M)	N/A	SY	M	74	N
250M	16-Jul-04	2320-31512	UB:EE	N/A	L	U	74	N
Glory Hole	INA	INA	undetermined	INA	AHY	F	76	N/A
Glory Hole	INA	INA	undetermined	INA	AHY	M	76	N/A
Hell Bird	INA	INA	undetermined	INA	AHY	F	77	N/A
Hell Bird	INA	INA	undetermined	INA	AHY	M	77	N/A

¹ N/A = not applicable; INA = information not available.

² **Color-band codes:** B = light blue, BEs = berry federal band, Bs = blue federal band, D = dark/navy blue, EE = electric yellow federal band, G = green, (HP) = half plastic bands/bands cut to half the height of a full plastic band, K = black, (M) = metal pin striped band, N = navy blue plastic band, O = orange, R = red, UB = unbanded, V = violet, W = white, XX = silver federal band, Y = yellow, Z = gold, undetermined = presence of bands could not be determined.

Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ Old combination included only if rebanded in 2004.

⁴ **Age in 2004:** L = nestling, HY = hatch year, SY = 2 years, AHY = 2 years or older, 3Y = 3 years, A3Y = 3 years or older, 4Y = 4 years, A4Y = 4 years or older, etc.

⁵ **Sex codes:** F = female, M = male, U = sex unknown.

⁶ **Observation status codes:** N = new capture, R = recapture - followed by date recaptured, RS = resight.

Table 3.14. Summary of Unpaired, Resident Willow Flycatchers and Individuals for which Residency and/or Breeding Status Could Not Be Confirmed, Topock, Havasu NWR, AZ, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Age ³	Sex ⁴	Location ⁵	Observation Status ⁶
Glory Hole	N/A	N/A	UB:UB	AHY	U	T10	RS, detected 11–29 May
Lost Lake	16-Jun-04	2320-31495	DY(M):EE	AHY	M	T17	N; detected 8–16 Jun
Swine Paradise	INA	INA	undetermined	AHY	U	T21	Detected 20 May–3 Jun
Pierced Egg	N/A	N/A	UB:UB	AHY	M	T33	RS, detected 22 Jun–4 Jul
Hell Bird	6-Jul-04	2320-31423	EE:RK(M)	AHY	U	T75	N; detected 30 Jun–14 Jul
Pipes 1	N/A	N/A	undetermined	AHY	U	F4	Detected 15–20 May, suspected migrant
PC6-1	N/A	N/A	UB:UB	AHY	M	F26	RS; detected 29–30 Jun
Platform	N/A	N/A	UB:UB	AHY	U	F30	RS; detected 7–11 May, suspected migrant
Barbed Wire	N/A	N/A	UB:UB	AHY	M	F31	RS, detected 25–29 May, suspected migrant
Swine Paradise	INA	INA	undetermined	AHY	U	F32	Detected 3 Jun, suspected migrant
Swine Paradise	INA	INA	undetermined	AHY	U	F35	Detected 3 Jun, suspected migrant
Hell Bird	25-Jul-04	2320-31560	EE:GY(M)	SY	M	F78	N; captured at 40 on 25 July, resighted at 74 on 26–27 July
Hell Bird	25-Jul-04	2320-31559	OK(M):EE	SY	U	F79	N; captured at 40 on 25 July, not detected post-capture
South Dike Road ⁷	INA	INA	undetermined	AHY	M	F98	Detected 28 May
South Dike Road ⁷	INA	INA	undetermined	AHY	M	F99	Detected 23 June

¹ N/A = not applicable; INA = information not available.

² **Color-band codes:** D = dark/navy blue, EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, O = orange, R = red, UB = unbanded, Y = yellow, undetermined = presence of bands could not be determined.

Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** SY = 2 years, AHY = 2 years or older.

⁴ **Sex codes:** M = male, U = sex unknown.

⁵ **Location codes:** T = territorial individual detected for at least 7 days, F = individual detected for less than 7 days.

⁶ **Observation status codes:** N = new capture, RS = resight.

⁷ Not a formal survey site, flycatchers detected en route.

Table 3.15. Summary of Unpaired, Resident Willow Flycatchers and Individuals for which Residency and/or Breeding Status Could Not Be Confirmed, Bill Williams NWR, AZ, in 2004

Site	Date Banded ¹	Federal Band # ¹	Color Combination ²	Age ³	Sex ⁴	Location ⁵	Observation Status ⁶
Site 3	10-Jun-04	2320-31539	EE:YY(M)	SY	M	T3	N, unpaired, detected 3–10 June
Site 1	INA	INA	undetermined	AHY	M	T10	Unpaired, detected 27 May–9 June
Site 3	7-Jul-03	2320-31412	OW(M):EE	3Y	M	T20	RS, unpaired, detected 14 May–5 July
Site 8	INA	INA	undetermined	AHY	U	F1	Detected 28 May, suspected migrant
Site 5	INA	INA	undetermined	AHY	U	F2	Detected 30 May, suspected migrant
Site 2	INA	INA	undetermined	AHY	U	F21	Detected 19 May, suspected migrant
Beaver Pond	N/A	N/A	UB:UB	AHY	U	F22	Detected 21 May, suspected migrant
Beaver Pond	N/A	N/A	UB:UB	AHY	U	F23	Detected 21-23 May, suspected migrant
Site 2	INA	INA	undetermined	AHY	U	F24	Detected 9 June, suspected migrant
Site 11	INA	INA	undetermined	AHY	U	F25	Detected 15–16 June, suspected migrant
Site 3	N/A	N/A	UB:UB	AHY	U	F30	Detected 13–14 May, suspected migrant
Site 2	INA	INA	undetermined	AHY	U	F31	Detected 19 May, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F32	Detected 23 May, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F34	Detected 23 May, suspected migrant
Mineral Wash	INA	INA	undetermined	AHY	U	F35	Detected 23 May, suspected migrant
Beaver Pond	N/A	N/A	UB:UB	AHY	U	F36	Detected 10 June, suspected migrant
Beaver Pond	N/A	N/A	UB:UB	AHY	U	F37	Detected 10 June, suspected migrant
Site 4	N/A	N/A	UB:UB	AHY	U	F38	Detected 16 June, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F39	Detected 21 May, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F40	Detected 23 May, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F41	Detected 30 May, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F42	Detected 30 May, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F43	Detected 23 May, suspected migrant
Beaver Pond	INA	INA	undetermined	AHY	U	F44	Detected 19 June, suspected migrant

¹ N/A = not applicable; INA = information not available.

² **Color-band codes:** EE = electric yellow federal band, (M) = metal pin striped band, O = orange, UB = unbanded, W = white, Y = yellow, undetermined = presence of bands could not be determined. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Age in 2004:** SY = 2 years, AHY = 2 years or older. 3Y = 3 years.

⁴ **Sex codes:** M = male, U = sex unknown.

⁵ **Location codes:** T = territorial individual detected for at least 7 days, F = individual detected for less than 7 days.

⁶ **Observation status codes:** N = new capture, RS = resight.

Table 3.16. Willow Flycatchers Color-Banded at Key Pittman Wildlife Management Area, NV, in 2004

Site	Date Banded	Federal Band #	Color Combination ¹	Age ²	Sex ³	Observation Status ⁴
Key Pittman	25-Jun-03	2320-31457 ⁵	EE:KG(M)	SY	M	R 3 Jul
Key Pittman	17-Jul-04	2320-31635	EE:YDY(M)	AHY	M	N
Key Pittman	17-Jul-04	2320-31636	UB:EE	L	U	N
Key Pittman	17-Jul-04	2320-31637	UB:EE	L	U	N
Key Pittman	17-Jul-04	2320-31638	UB:EE	L	U	N
Key Pittman	17-Jul-04	2360-59757	UB:EE	L	U	N
Key Pittman	11-Aug-04	2360-59767	UB:EE	L	U	N
Key Pittman	11-Aug-04	2360-59770	EE:UB	L	U	N
Key Pittman	12-Aug-04	2360-59772	YR(M):EE	AHY	F	N

¹ **Color-band codes:** D = dark/navy blue, EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, UB = unbanded, Y = yellow.

Color combinations are read as the bird's left leg and right leg, top to bottom; two/three letters designate every band; color-band designations for right and left legs are separated with a colon.

² **Age in 2004:** L = nestling, SY = 2 years, AHY 2 years or older.

³ **Sex codes:** F = female, M = male, U = sex unknown.

⁴ **Observation status codes:** N = new capture, R = Recapture - followed by date recaptured.

⁵ Recaptured 2003 nestling.

Table 3.17. Willow Flycatchers Color-Banded along the Virgin River near Mesquite, NV, in 2004

Site	Date Banded	Federal Band #	Color Combination ¹	Age ²	Sex ³	Observation Status ⁴
Riverside West	19-Jun-04	2320-31494	EE:OG(M)	AHY	U	N
Bunker Farm	29-Jun-03	2320-31473 ⁵	EE:OKO(M)	SY	M	R 16 Jul
Bunker Farm	16-Jul-04	2320-31630	UB:EE	L	U	N
Bunker Farm	16-Jul-04	2320-31631	UB:EE	L	U	N
Bunker Farm	16-Jul-04	2320-31632	RZ(M):EE	SY	F	N
Electric Avenue	4-Jun-04	2320-31491	GK(M):EE	AHY	M	N
Electric Avenue	19-Jul-02	2320-31492	EE:RG(M)	3Y	F	R 4 June
Electric Avenue	4-Jun-04	2320-31654	EE:KY(M)	AHY	M	N

¹ **Color-band codes:** EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, O = orange, R = red, UB = unbanded, Y = yellow, Z = gold. Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

² **Age in 2004:** L = nestling, SY = 2 years, AHY = 2 years or older, 3Y = 3 years.

³ **Sex codes:** F = female, M = male, U = sex unknown.

⁴ **Observation status codes:** N = new capture, R = Recapture - followed by date recaptured.

⁵ Recaptured 2003 nestling.

GILA RIVER AND COLORADO/GILA RIVER CONFLUENCE SOUTH TO MEXICO

From 10 to 30 June 2004, we recorded 40 willow flycatcher detections at eight sites along the Colorado River (Martinez Lake south to the Mexico border) and along the Gila River near Yuma (see Chapter 2 for details). Thirty-nine of these detections were recorded from 10 to 13 June, with a single flycatcher detected on 24 June. Field personnel captured and color-banded four new adults, all of which were second-year birds, near Martinez Lake on 10 and 11 June

(Table 3.18). Unsuccessful capture attempts were made at Martinez Lake and two other sites on 12 and 13 June. None of the color-banded individuals were detected post-capture, and other than a single detection at one site on 23 July, no flycatcher detections were recorded at any sites south of Bill Williams after 24 June, suggesting these individuals were northbound migrants.

Table 3.18. Willow Flycatchers Color-Banded along the Lower Colorado River South of the Bill Williams NWR to the Mexico Border, 2004

Site	Date Banded	Federal Band #	Color Combination ¹	Age ²	Sex ³	Observation Status ⁴
Great Blue Heron	10-Jun-04	2320-31503	EE:GG(M)	SY	U	N
Great Blue Heron	11-Jun-04	2320-31504	EE:GG(M)	SY	U	N
Great Blue Heron	10-Jun-04	2320-31599	EE:GG(M)	SY	U	N
Great Blue Heron	10-Jun-04	2320-31600	EE:GG(M)	SY	U	N

¹ **Color-band codes:** EE = electric yellow federal band, G = green, (M) = metal pin striped band.

Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

² **Age in 2004:** SY = 2 years.

³ **Sex codes:** U = sex unknown.

⁴ **Observation status code:** N = new capture.

ADULT BETWEEN-YEAR RETURN AND DISPERSAL

In 2003 we identified 54 adult, resident willow flycatchers at the life history study areas and Bill Williams, of which 28 (52%) were detected in 2004 (Table 3.19). All returning adults returned to the same study area as detected in 2003. In addition, we detected one individual banded as an adult in 2000 and not detected in 2003. This individual was detected at the same study area where originally banded.

Table 3.19. Adult Willow Flycatcher Annual Return from 2003 to 2004

Study Area	# Identified in 2003	# of 2003 Birds Detected in 2004	% Return	% Return to Same Site
Pahrnagat	11	6	55	100
Mesquite	24	12	50	100
Mormon Mesa	3	2	67	100
Topock	10	7	70	100
Bill Williams	6	1	17	100
Total	54	28	52	100

JUVENILE BETWEEN-YEAR RETURN AND DISPERSAL

In 2003, we banded 63 nestlings at the life history study areas and Bill Williams, of which two were known to have died before fledging. Of the 61 remaining juveniles, 13 (21%) were detected in 2004 (11 of known identity, 2 identified only as 2003 nestlings). Of the returning juveniles of known identity, six (55%) were detected at a different study area than where originally banded, and five (45%) were detected at the same study area (Table 3.20). In addition, we detected eight individuals that were banded as juveniles in 2002 or earlier and were not detected in 2003 (Table 3.21). Two (25%) of these individuals were detected at study areas other

than where originally banded; six (75%) returned to the same areas (Table 3.21). The median dispersal distance for all returning juvenile flycatchers exhibiting between-year movements in 2004 was 58 km (min = 20 km, max = 117 km).

Table 3.20. Summary of Juvenile Flycatcher Between-Year Movements for All Flycatchers Banded as Hatch Year Birds in 2003 and Recaptured or Resighted in 2004*

Study Area/ Site Banded 2003 ¹	Year Hatched	Study Area/Site Detected 2004 ¹	Distance Moved (km)	Federal Band #	Color Combination ²	Sex ³
PAHR/North	2003	KEPI ⁴	30	2320-31457	EE:KG(M)	M
PAHR/North	2003	LIFI/North	117	2320-31475	EE:WR(M)	M
PAHR/South	2003	PAHR/North	--	2320-31459	EE:DK(M)	M
MESQ/West	2003	LIFI/North	20	2320-31486	YV(M):EE	F
MESQ/West	2003	MESQ/Bunker Farm ⁴	--	2320-31473	EE:OKO(M)	M
MESQ/West	2003	MESQ/West	--	2320-31438	RK(M):EE	M
MESQ/West	2003	MESQ/West	--	2320-31471	EE:OW(M)	F
MESQ/West	2003	MESQ/West	--	2320-31480	WR(M):EE	F
MESQ/West	2003	MOME/Virgin River #1 N	40	2320-31428	EE:GZ(M)	U
MESQ/West	2003	MOME/Virgin River #1 N	40	2320-31440	OY(M):EE	U
BIWI/Site 3	2003	TOPO/PC6-1	72	2320-31407	ZO(M):EE	F

* Dispersal distances are given for flycatchers that moved between study areas.

¹ PAHR = Pahrnagat National Wildlife Refuge, LIFI = Littlefield, MESQ = Mesquite, MOME = Mormon Mesa, TOPO = Topock Marsh, BIWI = Bill Williams National Wildlife Refuge, KEPI = Key Pittman Wildlife Management Area.

² **Color-band codes:** EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, O = orange, R = red, V = violet, W = white, Y = yellow, Z = gold.
Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Sex codes:** F = female, M = male, U = sex unknown.

⁴ Site surveyed and/or monitored by personnel from an unrelated flycatcher project.

Table 3.21. Summary of Flycatcher Between-Year Movements for All Flycatchers Banded as Hatch Year Birds Prior to 2003, Not Detected in 2003, and Detected in 2004*

Study Area/Site Originally Banded ¹	Year Hatched	Study Area/Site Detected 2004 ¹	Distance Moved (km)	Federal Band #	Color Combination ²	Sex ³
TOPO/1000M	1998	TOPO/In Between	--	2390-92348	YY(P):XX	F
TOPO/800 M	1999	TOPO/Hell Bird	--	2140-66743	OG(M):Bs	M
MOME	1999	MESQ/West ⁴	40	2390-92451	KW(M):XX	F
MESQ/West	2001	PAHR/North	108	2320-31592	GO(M):EE	U
TOPO/800M	2001	TOPO/In Between	--	2140-66728	Bs:NN(P)	M
MESQ/West	2001	MESQ/West	--	2390-92434	UB:XX	M
MESQ/West	2001	MESQ/West	--	2390-92470	KR(M):XX	F
MESQ/West	2002	MESQ/Electric Avenue ⁵	--	2320-31492	EE:RG(M)	F

* With the exception of one bird noted in the table, information on any detections in years other than 2003 and 2004 is unavailable. Movement distances are given for individuals that moved between study areas.

¹ PAHR = Pahrnagat National Wildlife Refuge, MESQ = Mesquite, MOME = Mormon Mesa, TOPO = Topock Marsh.

² **Color-band codes:** Bs = blue federal band, EE = electric yellow federal band, G = green, K = black, (M) = metal pin striped band, N = navy blue plastic band, O = orange, (P) = full plastic band, R = red, UB = unbanded, W = white, Y = yellow, XX = silver federal band.
Color combinations are read as the bird's left leg and right leg, top to bottom; two letters designate every band; color-band designations for right and left legs are separated with a colon.

³ **Sex codes:** F = female, M = male, U = sex unknown.

⁴ This individual detected at Mesquite West in 2002.

⁵ Site surveyed and/or monitored by personnel from an unrelated flycatcher project.

DISCUSSION

Overall, 57 new adults and 89 juvenile Southwestern Willow Flycatchers were banded at the monitoring sites in 2004. Compared to 2003, we banded over double the number of new adults and 38% more juveniles. The greater number of new color-banded individuals in 2004 was largely due to the greater number of adults detected at Pahranaagat (35 in 2004 vs. 21 in 2003), Mormon Mesa (27 in 2004 vs. 20 in 2003), and Topock (67 in 2004 vs. 25 in 2003). Also, three additional monitoring sites (Littlefield, Muddy River, and Grand Canyon) contributed to the greater number of adults and juveniles color-banded in 2004. In addition to the newly banded birds, 54 individuals banded in previous years were detected in 2004 through resighting and recapture. In total, 57% of all adult flycatchers detected at the monitoring sites were banded by the end of the 2004 season. This compares to 55% in 2003. Maintaining high overall percentages of banded birds is important because it increases the ability to detect site fidelity and movement, provides a more accurate calculation of survivorship, and provides the information needed for future fecundity studies. Also, a large number of color-banded flycatchers will be vital in detecting and tracking movements in the event of a stochastic occurrence (e.g., fire, drought, flood), natural or otherwise, at any of the flycatcher life history study areas. As target and passive capture techniques are continually being refined, we anticipate the percentages of color-banded willow flycatchers at sites to increase in subsequent years.

Breeding vs. Unpaired Territories – At the monitoring sites, we recorded a total of 82 willow flycatcher territories in 2004. Of these, 64 (78%) consisted of paired flycatchers and 18 (22%) consisted of unpaired individuals. The spacing of any territorial bird species in prime habitat, particularly species like the flycatcher in which its breeding habitat is relatively fragmented and rare on a landscape level, may exclude some individuals from the breeding population(s). As prime and sub-optimal breeding habitats are filled, the remaining non-breeding individuals must wait for vacancies in either habitat as unpaired individuals, commonly referred to as floaters (Brown 1964, Gill 1995). The observable fact is that detections of floater and resident, unpaired willow flycatchers at breeding sites is not uncommon, and unpaired individuals have been recorded at other breeding sites across the species' range (Stafford 1986; Kenwood and Paxton 2001; Smith et al. 2002; Koronkiewicz et al. 2002, 2004; Furtek and Tomlinson 2003; Whitfield 2003). Additionally, other research has shown that an unequivocal determination of breeding status for all willow flycatchers in a population often cannot be made. There are several reasons for this. Willow flycatchers may be detected only once during the breeding season (Kenwood and Paxton 2001; Koronkiewicz et al. 2002, 2004; this document). Some individuals are non-territorial floaters, which are individuals that are seen once or irregularly, are typically quiet, and do not display territorial behavior toward other flycatchers or respond aggressively to conspecific broadcasts (Kenwood and Paxton 2001; Koronkiewicz et al. 2002, 2004). In addition, willow flycatcher males frequently engage in extra pair copulations (Paxton et al. 1997, Pearson 2002) and are commonly polygynous (Whitfield et al. 1998, Davidson and Allison 2003, Koronkiewicz et al. 2004, this document). The documentation of unpaired resident and non-territorial floater flycatchers is important for demographic analyses and management and conservation of the species, as these individuals serve as population reservoirs and replace other individuals that move or die. The assumption that all flycatchers detected during the breeding season are paired, breeding individuals (Braden and McKernan 1998, unpubl. data) is unsubstantiated and violates the basic tenets of avian territorial social systems (see Brown 1964, Kaufmann 1983, Rappole 1995).

Adult and Juvenile Between-Year Return and Dispersal – Of the 28 adult willow flycatchers that returned from 2003, all returned to the same study area at which they were detected in 2003. Of 61 juvenile willow flycatchers banded in 2003, 11 (18%) of known identity were detected in 2004, of which 6 (55%) were detected at a different study area than where originally banded and 5 (45%) at the same area. Willow flycatcher dispersal data at the monitoring sites for two seasons (2003–2004) are consistent with range-wide data (Luff et al. 2000, Kenwood and Paxton 2001, Koronkiewicz et al. 2002) and results from previous years at the study areas (McKernan and Braden 2002), with adult flycatchers likely to exhibit strong site fidelity to breeding areas and juveniles likely to disperse away from natal areas. Given the small population sizes and geographic isolation of willow flycatcher breeding populations in the Southwest, juvenile dispersal is an important population variable in terms of both gene flow and the establishment of new flycatcher populations. Furthermore, the observed differential age patterns in willow flycatcher dispersal may contribute to an understanding of the observed patterns of high genetic diversity within and low reproductive isolation among Southwestern Willow Flycatcher populations (Busch et al. 2000 as cited in Koronkiewicz et al. 2002).

Adult and Juvenile Survivorship – Survivorship is defined as the number of individuals that survive from one year to the next, and accurate estimates depend on year-to-year detection of uniquely marked birds. In 2003 we identified 54 adult and 61 juvenile willow flycatchers at the monitoring sites, of which 28 (52%) and 13 (21%), respectively, were detected in 2004. Thus, minimum estimated adult and juvenile survival from 2003 to 2004 was 52 and 21%, respectively. These simple annual percent survivorship calculations assume that all living flycatchers are detected in a given year, and individuals not detected are assumed to have died, unless detected elsewhere. Previous research has shown that some adults and juveniles go undetected for up to three years after being banded (Koronkiewicz et al. 2002, McKernan and Braden 2002, this document), and simple annual percent survivorship thus underestimates survival. To provide more robust estimates of annual survival, software programs (e.g., Brownie et al. 1985, White 1996) incorporating both survival and detection probabilities have been developed in recent years. In subsequent years of this study, as more flycatcher demographic data are acquired at the life history study areas and other monitoring sites, we anticipate using this software in determining detection probabilities and annual adult and juvenile willow flycatcher survivorship.

GILA RIVER AND COLORADO/GILA RIVER CONFLUENCE SOUTH TO MEXICO

In 2004, we continued color-banding studies on the extreme southern stretches of the Colorado River to better determine flycatcher residency, breeding status, and movement patterns in this area. We captured and color-banded four individuals, none of which were detected post-capture. All four captured flycatchers were second year birds (born in 2003), based on the presence of retained flight feathers (per Kenwood and Paxton 2001 and Koronkiewicz et al. 2002). As in 2003, flycatcher behavioral observations in this area suggest strongly that the individuals detected at these sites were northbound migrants (see Chapter 2). Whether there are differential age patterns in willow flycatcher northbound migration along the lower Colorado River is in need of further study. Likewise, it is apparent that the lower Colorado and Gila River riparian corridors are important flyways and stopover habitat for numerous northbound willow flycatchers. The degree to which Southwestern Willow Flycatchers use these riparian corridors is unknown and requires further study.

CHANGE IN COLOR-BAND METHODOLOGY

As in 2003, field personnel experienced difficulty resighting and correctly identifying the color combinations of willow flycatchers previously banded with celluloid-plastic color-bands and epoxy-enamel colored federal bands. As has been shown by Lindsey et al. (1995), celluloid-plastic leg bands undergo fading and discoloration to such a degree that within two years primary colors cannot be recognized under field conditions. Adding to the difficulty we experienced resighting celluloid-plastic bands, field personnel recaptured a returning individual (2390-92451; originally banded with plastic bands as a nestling in 1999) whose plastic bands had fallen off leaving only the federal band. Upon recapturing flycatchers previously banded with epoxy-enamel colored federal bands used prior to 2003, we found that chipping of the enamel, which revealed the original silver band color underneath, caused difficulties in correct color identification through binoculars. Correct field identification over multiple years of the unique set of color-bands on a bird's legs is important in a long-term study such as this because it eliminates the need to recapture an individual flycatcher multiple times to determine identity. Moreover, the ability to correctly identify a color-band combination quickly and accurately with binoculars lessens the total amount of time spent in an individual's territory during monitoring.

To remedy the color-band problems noted above, we continued to use used metal pinstriped color-bands and color anodized federal bands, which have shown to be safe for willow flycatchers and colorfast for over six years (Koronkiewicz et al. in press.). These metal color-bands were used on all newly captured flycatchers and on recaptured flycatchers that wore faded and indistinguishable color-bands.