

**FINAL REPORT ON BONITA CANYON
ROAD WILDLIFE STUDIES**

1996-2000

Submitted to:

San Joaquin Hills Transportation Corridor Agency
125 Pacifica, Suite 100
Irvine, CA 92618
Contact: Valarie McFall

Prepared by:

LSA Associates, Inc.
One Park Plaza, Suite 500
Irvine, CA 92614
(949) 553-0666

LSA Project No. TCA504

LSA

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EXECUTIVE SUMMARY

This report presents the final results of the five year noise and wildlife studies conducted by LSA Associates, Inc. in the vicinity of Bonita Canyon Road (formerly Ford Road) in Newport Beach (formerly Irvine), Orange County, California. These studies were funded by the Transportation Corridor Agencies as required in the Section 7 Biological Opinion on the Ford Road Extension and Realignment.

The average noise levels (Leq) for monitoring stations during the sample period ranged from 50-65 dBA. Overall, noise levels occasionally exceeded the 60 dBA Leq monitored noise level criterion, which has been used for wildlife habitat areas. Temporary construction (especially in 1997 and 2000) and aircraft were the primary source of noise levels above 60 dBA Leq. No evidence was obtained that noise levels had any negative effect on nesting birds.

The number of pairs of California gnatcatchers (*Polioptila californica californica*) in the study area ranged from 16 to 24 over the course of the study. An average of 12.4 pairs nested successfully each season to produce an average of 47 fledglings (2.6 per pair), with 2000 the most successful year of the study (18 pairs produced 54-65 fledglings). A total of 244 gnatcatchers were color banded during the study, with 16 birds documented leaving the site for UCI, San Joaquin Marsh, Coyote Canyon Landfill, the San Joaquin Hills, and Laguna Canyon. Fourteen color banded birds moved onto the study area from UCI, Turtle Rock, Sand Canyon Reservoir, and Crystal Cove State Park.

Annual grassland was virtually eliminated from the area during the study; however, the net amount of coastal sage scrub was reduced from 71 acres in 1996 to 64 in 2000. Over half of the existing scrub is in restoration areas, the majority of it put in place by the TCA. The TCA is also primarily responsible for another 29 acres of wetland restoration in the study area.

Three singing male least Bell's vireos (*Vireo bellii pusillus*) were reported in 1996 without any females. Only 0-2 males were present in subsequent years with successful nesting taking place only in 2000, when a single pair fledged three young.

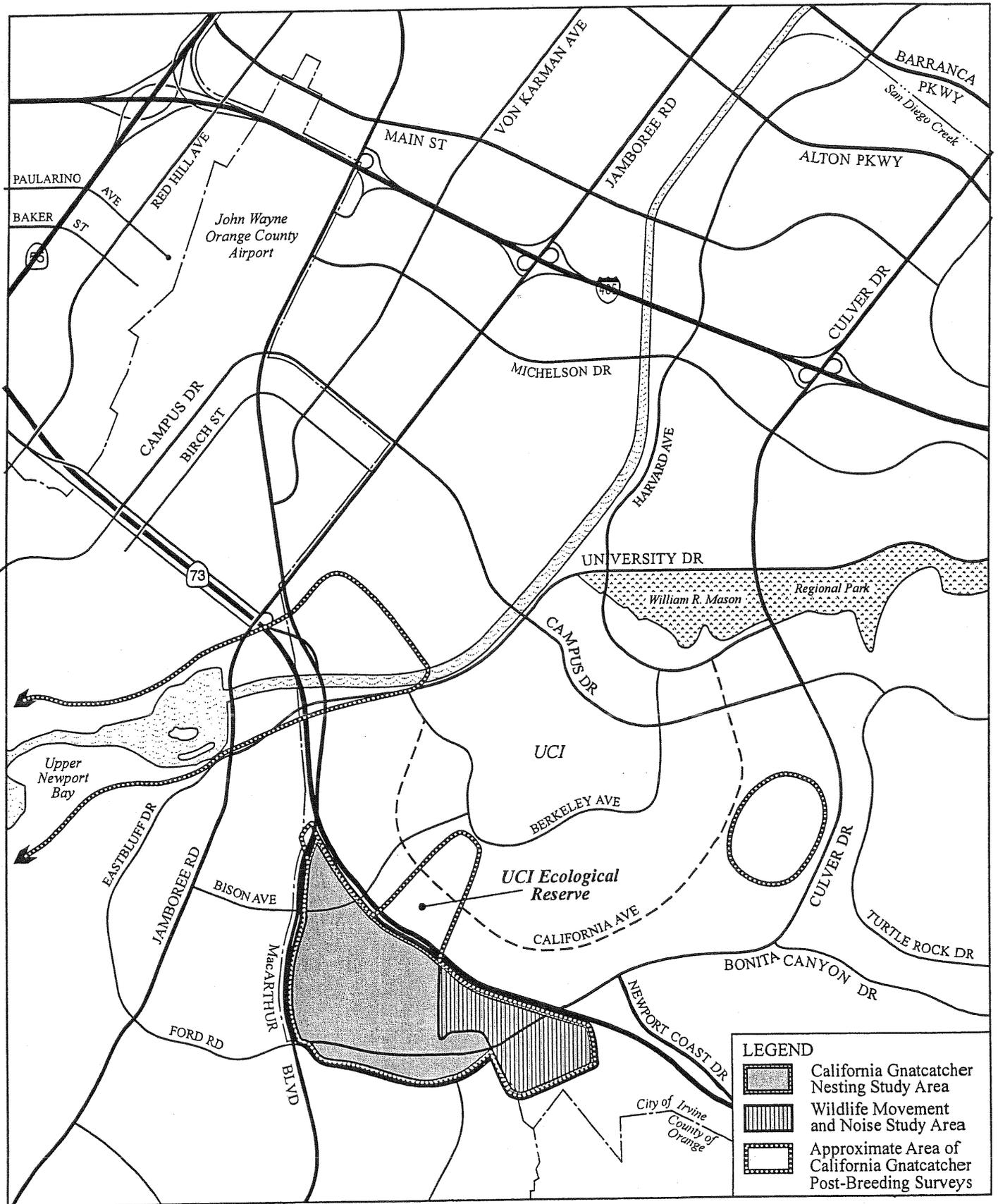
Each year of the study, wildlife was documented regularly using the undercrossings on Bonita Canyon Road, especially medium sized animals such as coyote (*Canis latrans*) and bobcat (*Felix rufus*). Wildlife use of the study area changed over the course of the study, primarily due to extensive residential development in nearby areas.

Wildlife continues to use the area in proximity to Bonita Canyon Road and the San Joaquin Hills Transportation Corridor, including the threatened and endangered California gnatcatcher and least Bell's vireo, respectively.

INTRODUCTION

This is the final report documenting wildlife studies conducted by LSA Associates, Inc. (LSA) in the vicinity of Bonita Canyon Road (formerly Ford Road) in Newport Beach (formerly Irvine), Orange County, California. These studies were funded by the Transportation Corridor Agencies (TCA) as required in the Section 7 Biological Opinion on the Ford Road Extension and Realignment (USFWS 1993), and with the successful completion of these studies, the TCA has met its mitigation obligation. Two federally listed birds nest in the area: the threatened coastal California gnatcatcher (*Polioptila californica californica*) and the endangered least Bell's vireo (*Vireo bellii pusillus*).

Four subjects were addressed by LSA: noise assessment, wildlife movement, California gnatcatchers, and least Bell's vireos. The study area is shown on Figure 1.



LEGEND

	California Gnatcatcher Nesting Study Area
	Wildlife Movement and Noise Study Area
	Approximate Area of California Gnatcatcher Post-Breeding Surveys

4/23/01(TCA504)

Figure 1

LSA

 Scale in Feet

 0 1500 3000

Project Location and Study Areas

NOISE ASSESSMENT

BASELINE MEASUREMENTS – 1995

Noise level surveys were conducted in the Bonita Reservoir wildlife habitat area with Larson-Davis Models 700 and 720 sound level meters using the A-weighted filter and slow response mode settings. The locations of the four measurement sites are shown in Figure 2.

Baseline noise measurements were conducted on July 28 and 31, 1995, several days before the opening of the New Ford Road/Bonita Canyon Road. Using a calibrated sound level meter, one 15 minute sample of A-weighted noise levels was taken at each of the four locations listed below. The measurements were conducted in the late afternoon (during the hours of estimated peak traffic noise on Newport Coast Drive) and in the absence of construction equipment noise. The following is a summary of the results:

Site 1 (Bonita Reservoir):	Leq=51.3dBA, Lmax=63.2dBA, Lmin=42.7dBA
Site 2 (Bonita Reservoir):	Leq=47.5dBA, Lmax=55.9dBA, Lmin=41.3dBA
Site 3 (Near LDS Church Site):	Leq=50.4dBA, Lmax=59.1dBA, Lmin=46.5dBA
Site 4 (NCD Wetlands Mitigation Site):	Leq=52.1dBA, Lmax=63.6dBA, Lmin=46.7dBA

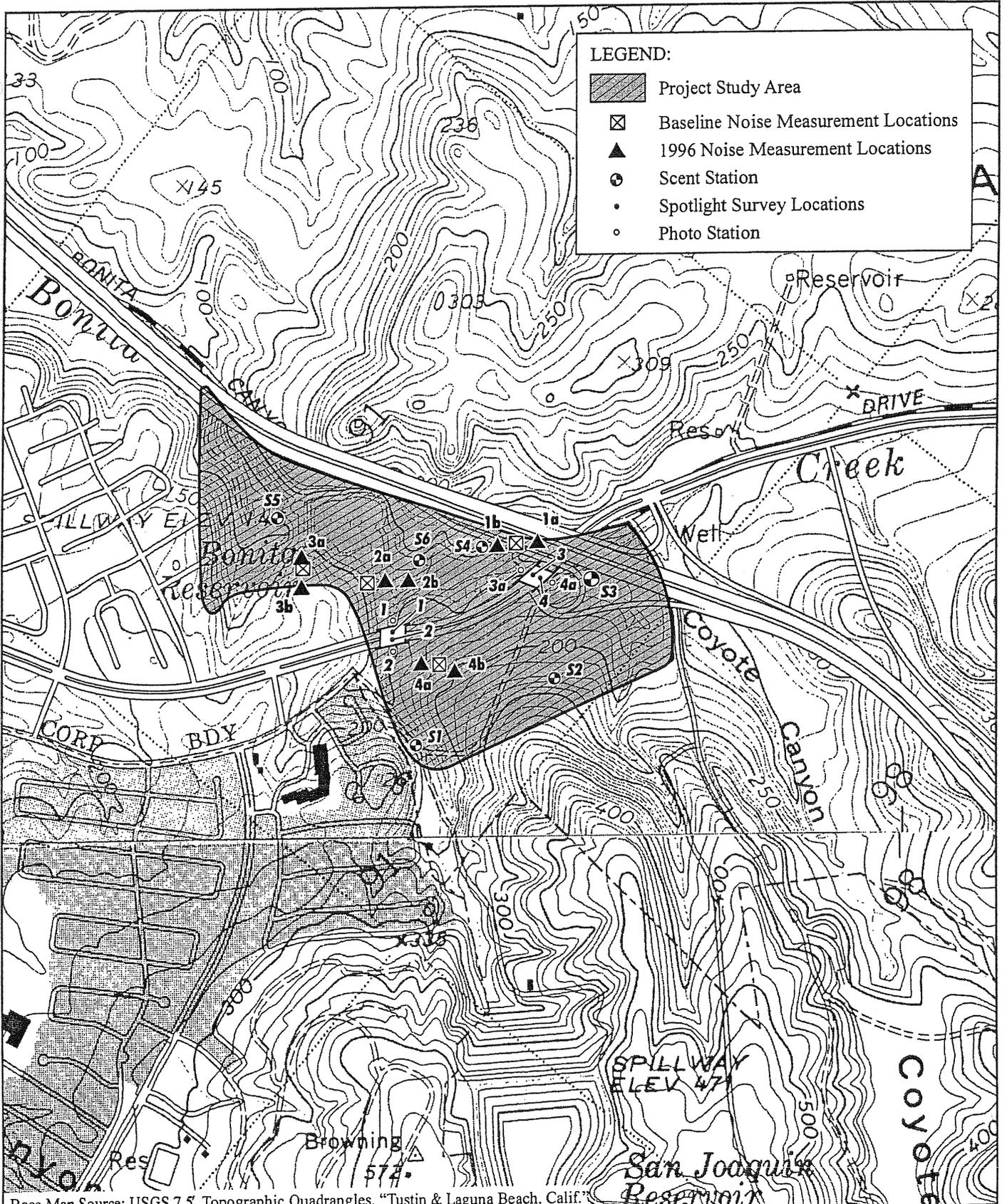
The above results are fairly uniform, varying from 47.5 to 52.2 dBA on an Leq (energy average) basis. The existing noise levels are well below the projected 60 dBA Leq noise contour, as would be expected of measurements conducted in the absence of nearby noise sources. Maximum noise levels, varying from 55.9 dBA to 63.6 dBA, are attributable mainly to aircraft overflights. The influence of Newport Coast Drive was small, with traffic noise from that roadway barely audible most of the time, with the exception of infrequent heavy trucks and motorcycles.

1996-2000 MEASUREMENTS SUMMARY

Survey Description and Methods

During the 1996 noise monitoring session, measurements were taken at or near the four sites where noise levels were measured in 1995. Measurement samples were obtained at two positions at each of the four sites, since dense vegetation and lack of position indicators or markers prevented determination of the exact locations of the previous measurement positions. Sample periods ranged from eight to 100 minutes, and the average noise levels and statistical levels were analyzed and recorded in consecutive two minute intervals during the measurement period.

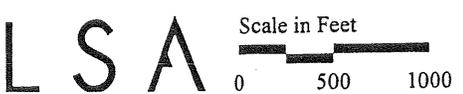
The noise level measurements conducted during the years 1997 through 2000 were made at or near eight sites where noise levels were previously measured in the Bonita Reservoir wetlands/mitigation area near the Bonita Canyon Road/New Ford Road and San Joaquin Hills Transportation Corridor (SJHTC) interchange. A map indicating the locations of the eight measurement sites used during the



Base Map Source: USGS 7.5 Topographic Quadrangles, "Tustin & Laguna Beach, Calif."

4/25/01(TCA504)

Figure 2



Noise Monitoring Stations and Wildlife Movement Study Area 1996

years of 1997 through 2000 is provided in Figure 3, and the positions of the locations for the noise monitoring surveys conducted between 1995 and 2000 are described in Table A. As indicated in Figure 3, these locations are generally not as far from the roadway as the position of the previously predicted 60 dBA Leq traffic noise contour. Due to the inaccessibility and sometimes absence of position markers in the thicket/marsh areas, it was generally not possible to measure/establish a precise distance to a suitable monitoring site. Also, traffic on the roadways was not visible from some of these monitoring locations due to thick vegetation and the embankment/noise wall along the SJHTC. Noise measurement samples at these locations were obtained during the morning and afternoon peak traffic periods. Sampling periods for 1997 through 2000 were 15 minutes in all cases, and the average noise levels and statistical levels were analyzed and recorded in consecutive two minute intervals during the measurement periods. During the measurement intervals, several observations were made to detect and note sources of audible sound, predominant sounds, sound levels displayed by the noise monitor, and corresponding time of occurrence.

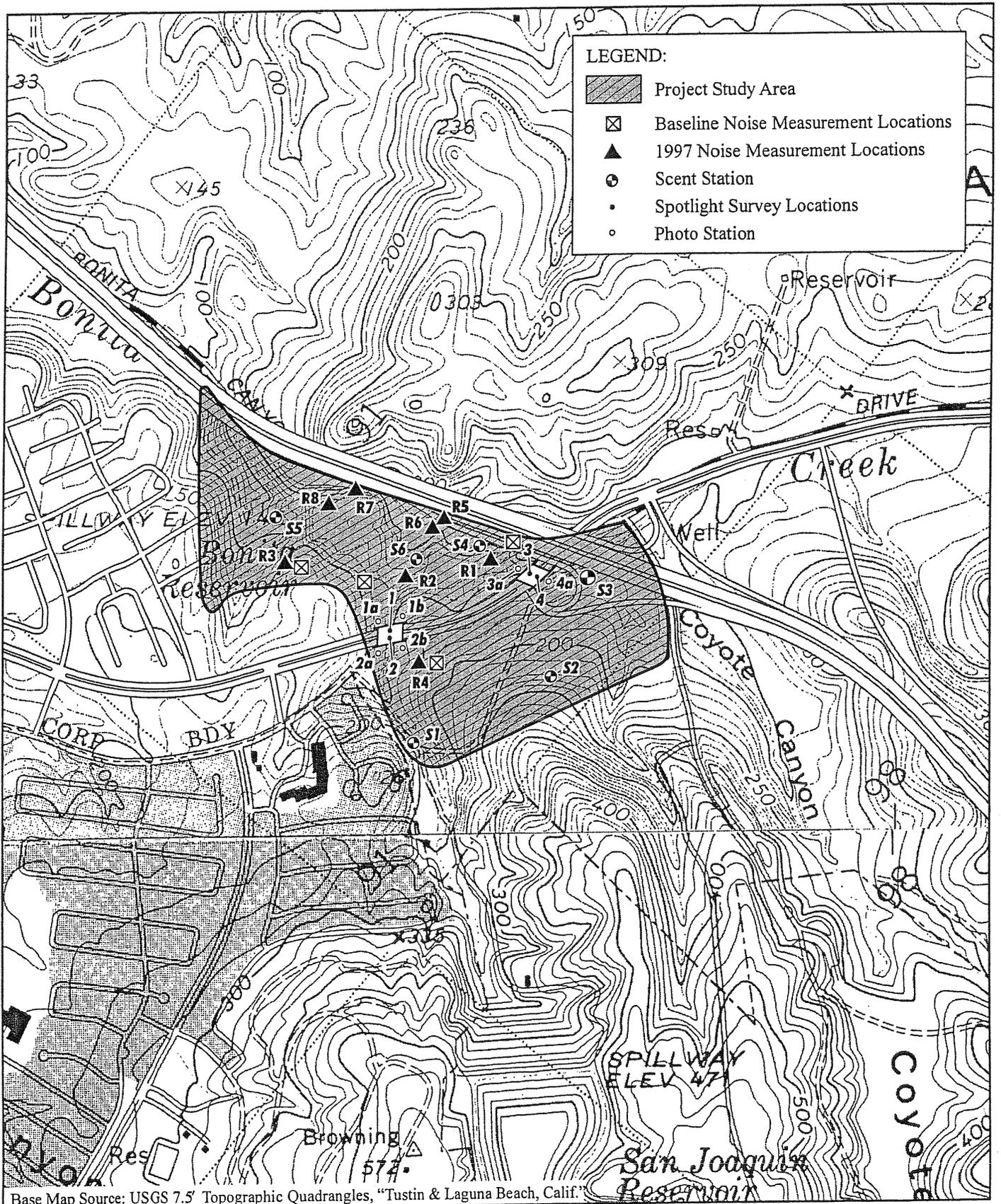
SUMMARY OF RESULTS

A summary of the composite A-weighted noise levels measured during the various sampling periods at the four selected sites for 1995 and 1996 and the eight selected sites for each year from 1997 through 2000 is provided in Table A. At each site, the noise levels were confounded due to multiple, distributed sources at various directions and distances relative to the measurement positions. The average noise levels (Leq) for the sample periods of 1996 through 2000 ranged from 50 to 65 dBA. Noise levels above 57 dBA were generally caused by aircraft, construction equipment operation, and truck traffic related to the church facility project to the west and the SJHTC roadway and interchange construction project to the east, north, and south.

During the 1996 noise monitoring session, the SJHTC and Bonita Canyon Road interchange area immediately adjacent to the Bonita Reservoir site were under construction and not operational. The SJHTC and Bonita Canyon Road interchange area, immediately adjacent to the Bonita Reservoir site, became operational prior to the 1997 noise monitoring session and has been in operation for all subsequent noise monitoring sessions. The measured noise levels reported in Table A included significant noise from aircraft and frequent loud bird call sounds. Therefore, the average noise levels listed in Table A are only partially related to traffic on Ford/Bonita Canyon Road.

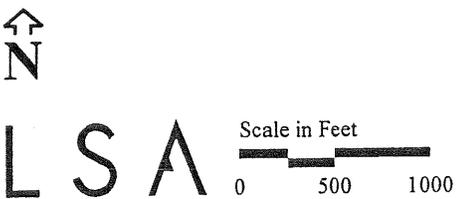
DISCUSSION OF RESULTS

In some cases the average sound level, which is defined as the level of the average A-weighted sound intensity and referred to as the equivalent continuous level (Leq), is not indicative of the general character or perceived loudness of the sound and its effects on people or animals. A few high noise level events during a relatively long sample period will result in an Leq that is significantly greater than the mean level or the 50 percentile level (often abbreviated as L₅₀). In these cases, the observer does not "hear" an Leq, but hears long periods of relatively low fluctuating sound levels interrupted by a few events with much higher noise level fluctuations. When the high noise level events are frequent or of long duration, the Leq and L₅₀ values can be about equal, and either noise parameter could represent what the observer "hears."



4/25/01(TCA504)

Figure 3



Noise Monitoring Stations and
Wildlife Movement Study Area 1997-2000

Table A: Measured A-Weighted Noise Levels at Bonita Reservoir/Wetlands Area

Year	Location	Average Noise Level (Leq)		Noise Level Range	
		A.M.	P.M.	A.M.	P.M.
1995 ¹	350 feet north of roadway, 150 feet west of SJHTC		51.3 dBA		42.7 to 63.2 dBA
1996	a 350 feet north of roadway, 100 feet west of SJHTC	53			
	b 400 feet north of roadway, 200 feet west of SJHTC	61			
1997	Approximately 250 feet northwest of Bonita Canyon Road/New Ford Road, 250 feet southwest of San Joaquin Hills Toll Road. In thicket near dry streambed.	52.5 dBA - Birds and traffic	56.5 dBA - Traffic	56 to 64 dBA - Birds 50 to 60 dBA - Traffic	60 to 66 dBA - Trucks 50 to 60 dBA - Traffic
1998	Approximately 250 feet northwest of Bonita Canyon Road/New Ford Road, 250 feet southwest of San Joaquin Hills Toll Road. In thicket near dry streambed.	53.5 dBA - Traffic, birds, construction	51.5 dBA - Birds, traffic, aircraft, construction	50 to 59 dBA - Traffic 45 to 56 dBA - Birds 46 to 57 dBA - Aircraft 41 to 47 dBA - Construction	46 to 54 dBA - Birds 48 to 55 dBA - Traffic 48 to 67 dBA - Aircraft 42 to 46 dBA - Construction
1999	Approximately 250 feet northwest of Bonita Canyon Road/New Ford Road, 250 feet southwest of San Joaquin Hills Toll Road. In thicket near dry streambed.	51.9 dBA - Traffic, birds, aircraft	52.8 dBA - Birds, traffic, aircraft, construction	50 to 55 dBA - Traffic 48 to 52 dBA - Birds 53 to 55 dBA - Aircraft	48 to 57 dBA - Birds 50 to 59 dBA - Traffic 60 to 65 dBA - Aircraft 50 to 55 dBA - Construction

¹ The 1995 a-weighted noise levels were taken at locations 1-4, in the late afternoon only. Construction equipment noise was absent. Sources of noise are unavailable.

Year	Location	Average Noise Level (Leq)		Noise Level Range	
		A.M.	P.M.	A.M.	P.M.
2000	Approximately 250 feet northwest of Bonita Canyon Road/New Ford Road, 250 feet southwest of San Joaquin Hills Toll Road. In thicket near dry streambed.	61.4 dBA - Construction (the dominant source), birds, traffic, aircraft	56.2 dBA - Construction (the dominant source), traffic, birds, aircraft	48 to 57 dBA - Birds 57 to 60 dBA - Traffic 60 to 65 dBA - Aircraft 62 to 68 dBA - Construction	60 to 63 dBA - Construction 52 to 56 dBA - Traffic 48 to 53 dBA - Birds 53 to 55 dBA - Aircraft
Location 2					
1995	400 feet north of roadway, 500 feet east of Location 3		47.5 dBA		41.3 to 55.9 dBA
1996	a 400 feet north of roadway, 600 feet east of Location 3		50.5		
	b 400 feet north of roadway, 800 feet east of Location 3		54		
1997	Approximately 325 feet north of Bonita Canyon Road/New Ford Road. In thicket near streambed and willow trees.	54.5 dBA - Traffic		50.5 dBA - Traffic and birds	55 to 57 dBA - Aircraft 43 to 58 dBA - Traffic
1998	Approximately 325 feet north of Bonita Canyon Road/New Ford Road. In thicket near streambed and willow trees.	50.9 dBA - Traffic, birds, aircraft, construction		52.5 dBA - Traffic, birds, aircraft, construction	48 to 55 dBA - Aircraft 44 to 51 dBA - Birds 48 to 56 dBA - Traffic 42 to 45 dBA - Construction
1999	Approximately 325 feet north of Bonita Canyon Road/New Ford Road. In thicket near streambed and willow trees.	54.4 dBA - Traffic, birds, aircraft		54.4 dBA - Traffic, birds, aircraft, construction	50 to 68 dBA - Aircraft 44 to 51 dBA - Birds 52 to 62 dBA - Traffic 54 to 58 dBA - Construction
2000	Approximately 325 feet north of Bonita Canyon Road/New Ford Road. In thicket near streambed and willow trees.	61.6 dBA - Construction (the dominant source), traffic, birds, aircraft		55.7 dBA - Traffic, birds, aircraft, construction	55 to 61 dBA - Aircraft 52 to 58 dBA - Traffic 45 to 52 dBA - Birds 58 to 64 dBA - Construction

Year	Location	Average Noise Level (Leq)		Noise Level Range	
		A.M.	P.M.	A.M.	P.M.
Location 3					
1995	Hilltop 600 feet north of roadway		50.4 dBA		46.5 to 59.1 dBA
1996	a Hilltop 600 feet north of roadway		51		
	b Fence 500 feet north of roadway		50.5		
	a Hilltop 600 feet north of roadway		56		
	b Fence 500 feet north of roadway		53		
1997	On top of knoll 600 feet north of Bonita Canyon Road/New Ford Road.	65 dBA - Construction equipment		59 dBA - Construction Equipment 51 dBA - Traffic and birds	53 to 64 dBA - Construction equipment 56 to 58 dBA - Aircraft 48 to 53 dBA - Traffic
1998	On top of knoll 600 feet north of Bonita Canyon Road/New Ford Road.	49 dBA - Traffic, birds, aircraft, construction		51 dBA - Traffic, birds, construction, aircraft	42 to 58 dBA - Aircraft 46 to 53 dBA - Traffic 43 to 52 dBA - Birds 44 to 46 dBA - Construction
1999	On top of knoll 600 feet north of Bonita Canyon Road/New Ford Road.	53.4 dBA - Traffic, birds, aircraft		54.4 dBA - Traffic, birds, construction, aircraft	50 to 58 dBA - Traffic 48 to 52 dBA - Birds 55 to 65 dBA - Aircraft 54 to 56 dBA - Construction
2000	On top of knoll 600 feet north of Bonita Canyon Road/New Ford Road.	60.5 dBA - Construction (the dominant source), traffic, birds, aircraft		57.3 dBA - Traffic, birds, aircraft	54 to 58 dBA - Aircraft 50 to 57 dBA - Traffic 46 to 49 dBA - Birds
Location 4					
1995	300 feet south of roadway			52.1 dBA	46.7 to 63.6 dBA

Year	Location	Average Noise Level (Leq)		Noise Level Range	
		A.M.	P.M.	A.M.	P.M.
1996	a 300 feet south of roadway		51		
	b 350 feet south of roadway		52		
1997	Approximately 150 feet south of a toll road sign along northbound Bonita Canyon Road/New Ford Road.	52.5 dBA - Birds and traffic	53.5 dBA - Birds and Traffic	56 to 64 dBA - Birds 48 to 60 dBA - Traffic	62 to 76 dBA - Aircraft 44 to 61 dBA - Traffic
1998	Approximately 150 feet south of a toll road sign along northbound Bonita Canyon Road/New Ford Road.	50.5 dBA - Birds, traffic	52.6 dBA - Birds, traffic, aircraft, wind/tree leaves	42 to 56 dBA - Birds 44 to 54 dBA - Traffic No aircraft noise observed No construction noise observed	46 to 53 dBA - Birds 43 to 52 dBA - Traffic 47 to 64 dBA - Aircraft No construction noise observed
1999	Approximately 150 feet south of a toll road sign along northbound Bonita Canyon Road/New Ford Road.	55.3 dBA - Birds, traffic, aircraft	55.3 dBA - Birds, traffic, aircraft, construction	50 to 51 dBA - Birds 54 to 61 dBA - Traffic 50 to 63 dBA - Aircraft	46 to 53 dBA - Birds 56 to 63 dBA - Traffic 53 to 64 dBA - Aircraft 50 to 54 dBA - Construction
2000	Approximately 150 feet south of a toll road sign along northbound Bonita Canyon Road/New Ford Road.	62.4 dBA - Construction (the dominant source), birds, traffic, aircraft	59.6 dBA - Birds, traffic, aircraft	46 to 53 dBA - Birds 56 to 63 dBA - Traffic 53 to 64 dBA - Aircraft 65 to 78 dBA - Construction	50 to 51 dBA - Birds 58 to 64 dBA - Traffic 50 to 65 dBA - Aircraft
Location 5					
1997	Approximately 1,000 feet north of Bonita Canyon Road/New Ford Road interchange and 125 feet southwest of wall at San Joaquin Hills Toll Road on a dirt walkway.	53 dBA - Construction, birds, and traffic	51 dBA - Construction, birds, and traffic	46 to 60 dBA - Construction equipment	48 to 60 dBA - Construction equipment
1998	Approximately 1,000 feet north of Bonita Canyon Road/New Ford Road interchange and 125 feet southwest of wall at San Joaquin Hills Toll Road on a dirt walkway.	52 dBA - Construction, birds, aircraft, traffic	52 dBA - Construction, birds, aircraft, traffic	44 to 53 dBA - Construction 43 to 56 dBA - Birds 46 to 64 dBA - Aircraft 45 to 54 dBA - Traffic	48 to 56 dBA - Construction 45 to 53 dBA - Birds 44 to 58 dBA - Aircraft 42 to 52 dBA - Traffic

Year	Location	Average Noise Level (Leq)		Noise Level Range	
		A.M.	P.M.	A.M.	P.M.
1999	Approximately 1,000 feet north of Bonita Canyon Road/New Ford Road interchange and 125 feet southwest of wall at San Joaquin Hills Toll Road on a dirt walkway.	53.7 dBA - Birds, aircraft, traffic	52.8 dBA - Construction, birds, aircraft, traffic	50 to 53 dBA - Birds 53 to 60 dBA - Aircraft 52 to 56 dBA - Traffic	50 to 52 dBA - Construction 53 to 56 dBA - Birds 52 to 60 dBA - Aircraft 54 to 60 dBA - Traffic
2000	Approximately 1,000 feet north of Bonita Canyon Road/New Ford Road interchange and 125 feet southwest of wall at San Joaquin Hills Toll Road on a dirt walkway.	64.7 dBA - Construction (the dominant source), birds, aircraft, traffic	60.9 dBA - Construction (the dominant source), birds, aircraft, traffic	62 to 68 dBA - Construction 53 to 56 dBA - Birds 60 to 65 dBA - Aircraft 61 to 64 dBA - Traffic	60 to 66 dBA - Construction 50 to 58 dBA - Birds 53 to 60 dBA - Aircraft 57 to 62 dBA - Traffic
Location 6					
1997	Approximately 100 feet southeast of Location 5. In thicket south of creek.	54 dBA - Construction, birds, frogs	50 dBA - Traffic, birds, frogs	49 to 60 dBA - Construction equipment	45 to 57 dBA - Traffic and birds
1998	Approximately 100 feet southeast of Location 5. In thicket south of creek.	52 dBA - Construction, traffic, aircraft, birds, frogs	51 dBA - Construction, birds, aircraft, traffic, frogs	44 to 53 dBA - Construction 44 to 56 dBA - Birds 46 to 64 dBA - Aircraft 44 to 53 dBA - Traffic	48 to 56 dBA - Construction 45 to 54 dBA - Birds 44 to 58 dBA - Aircraft 41 to 51 dBA - Traffic
1999	Approximately 100 feet southeast of Location 5. In thicket south of creek.	52.4 dBA - Traffic, aircraft, birds	52.8 dBA - Construction, birds, aircraft, traffic	51 to 55 dBA - Birds 51 to 52 dBA - Aircraft 50 to 53 dBA - Traffic	52 to 53 dBA - Construction 57 to 59 dBA - Birds 51 to 56 dBA - Aircraft 50 to 55 dBA - Traffic
2000	Approximately 100 feet southeast of Location 5. In thicket south of creek.	60.2 dBA - Construction (the dominant source), birds, aircraft, traffic	57.3 dBA - Construction, traffic, aircraft, birds	55 to 65 dBA - Construction 55 to 60 dBA - Birds 50 to 56 dBA - Aircraft 51 to 56 dBA - Traffic	53 to 61 dBA - Construction 51 to 55 dBA - Birds 51 to 54 dBA - Aircraft 50 to 55 dBA - Traffic

Year	Location	Average Noise Level (Leq)		Noise Level Range	
		A.M.	P.M.	A.M.	P.M.
1997	Approximately 1,600 feet northwest of Bonita Canyon Road/New Ford Road/SJHTC interchange, and in thicket 200 feet southwest of edge of wall at San Joaquin Hills Toll Road.	54.5 dBA - Construction equipment and birds	62 dBA - Construction equipment	48 to 63 dBA - Construction equipment 58 to 61 dBA - Birds 60 to 62 dBA - Aircraft	53 to 71 dBA - Construction equipment
1998	Approximately 1,600 feet northwest of Bonita Canyon Road/New Ford Road/SJHTC interchange, and in thicket 200 feet southwest of edge of wall at San Joaquin Hills Toll Road.	52 dBA - Construction, aircraft, traffic, birds	55 dBA - Construction, traffic, birds, aircraft	43 to 48 dBA - Construction 48 to 53 dBA - Traffic 44 to 56 dBA - Birds 46 to 54 dBA - Aircraft	44 to 50 dBA - Construction 46 to 56 dBA - Traffic 48 to 58 dBA - Birds 44 to 49 dBA - Aircraft
1999	Approximately 1,600 feet northwest of Bonita Canyon Road/New Ford Road/SJHTC interchange, and in thicket 200 feet southwest of edge of wall at San Joaquin Hills Toll Road.	53.3 dBA - Construction, aircraft, traffic, birds	53.1 dBA - Construction, traffic, birds, aircraft	49 to 52 dBA - Construction 51 to 54 dBA - Traffic 49 to 53 dBA - Birds 50 to 54 dBA - Aircraft	47 to 52 dBA - Construction 49 to 51 dBA - Traffic 48 to 58 dBA - Birds 52 to 63 dBA - Aircraft
2000	Approximately 1,600 feet northwest of Bonita Canyon Road/New Ford Road/SJHTC interchange, and in thicket 200 feet southwest of edge of wall at San Joaquin Hills Toll Road.	59.5 dBA - Construction (the dominant source), traffic, birds, aircraft	60.0 dBA - Construction (the dominant source), aircraft, traffic, birds	60 to 63 dBA - Construction 56 to 59 dBA - Traffic 48 to 58 dBA - Birds 52 to 63 dBA - Aircraft	60 to 65 dBA - Construction 56 to 60 dBA - Traffic 49 to 53 dBA - Birds 50 to 54 dBA - Aircraft

Year	Location	Average Noise Level (Leq)		Noise Level Range	
		A.M.	P.M.	A.M.	P.M.
1997	Approximately 200 feet southeast of Location 7, and in thicket 150 feet east of dirt road at west side of thicket. Near 7 th light pole from toll road and (Ford Road) bridge underpass.	55 dBA - Construction equipment and aircraft	60 dBA - Construction equipment 64 dBA - Wind noise	47 to 63 dBA - Construction equipment 54 to 61 dBA - Aircraft	54 to 67 dBA - Construction equipment 56 to 74 dBA - Wind noise
1998	Approximately 200 feet southeast of Location 7, and in thicket 150 feet east of dirt road at west side of thicket. Near 7 th light pole from toll road and (Ford Road) bridge underpass.	51 dBA - Construction, aircraft, traffic, birds	54 dBA - Construction, aircraft, birds, traffic	43 to 48 dBA - Construction 49 to 54 dBA - Traffic 44 to 56 dBA - Birds 46 to 54 dBA - Aircraft	44 to 50 dBA - Construction 47 to 57 dBA - Traffic 48 to 57 dBA - Birds 44 to 59 dBA - Aircraft
1999	Approximately 200 feet southeast of Location 7, and in thicket 150 feet east of dirt road at west side of thicket. Near 7 th light pole from toll road and (Ford Road) bridge underpass.	54.8 dBA - Construction, aircraft, traffic, birds	55.6 dBA - Construction, aircraft, birds, traffic	49 to 51 dBA - Construction 48 to 51 dBA - Traffic 48 to 56 dBA - Birds 49 to 54 dBA - Aircraft	51 to 52 dBA - Construction 50 to 52 dBA - Traffic 48 to 55 dBA - Birds 52 to 65 dBA - Aircraft
2000	Approximately 200 feet southeast of Location 7, and in thicket 150 feet east of dirt road at west side of thicket. Near 7 th light pole from toll road and (Ford Road) bridge underpass.	58.5 dBA - Construction (the dominant source), aircraft, birds, traffic	58.9 dBA - Construction (the dominant source), aircraft, traffic, birds	59 to 62 dBA - Construction 54 to 57 dBA - Traffic 45 to 55 dBA - Birds 52 to 63 dBA - Aircraft 48 to 52 dBA - Train	60 to 64 dBA - Construction 50 to 54 dBA - Traffic 48 to 53 dBA - Birds 50 to 54 dBA - Aircraft

1996

The average A-weighted noise level, Leq during the 1996 monitoring periods, ranged from 51 dB to 61 dB. The Leq of 61 dB from construction equipment operations was measured at Location 1, approximately 400 feet north of Bonita Canyon Road, and approximately 200 feet west of SJHTC during the 5:47 -5:55 interval session. At location 2 in the thickly vegetated Bonita Reservoir wetlands area about 400 feet north of the roadway, the sounds of birds were loud and frequent, contributing a significant portion of the composite sound intensity. During the measurement period the composite noise from birds, construction activity, and traffic on the roadway resulted in an Leq of 50 dB, and an L₅₀ of 48 dB. Location 4, approximately 300 feet south of Bonita Canyon Road, was subject to less construction noise than the other locations. However, the noise levels were confounded by sounds from birds, aircraft, and construction trucks. Simultaneous measurements were made at pairs of locations for comparison.

1997

The noise levels measured at Locations 1, 2, and 4 were originated mainly from light to moderate traffic on Bonita Canyon Road and sounds of nearby birds, with resulting Leq values of 50 to 57 dBA. The measured noise levels at Locations 3, 7, and 8 were due primarily to construction equipment operation noise at a large residential project site within 800 to 1,800 feet northwest of these locations. The equivalent continuous noise levels (Leq) were 55 to 65 dBA with frequent episodes of noise level maxima in the 55 to 80 dBA range. Locations 5 and 6 are at the bottom of the embankment/wall along the SJHTC, and are estimated to be on the order of 40 feet below the top of the wall. The measured noise levels were due to construction equipment, birds, and roadway traffic. The average noise levels (Leq) were 50 to 54 dBA.

1998

The noise levels measured at Locations 1, 2, and 4 were due mainly to moderate traffic flow on Bonita Canyon Road and bird sounds, with resulting Leq values of 50.5 to 53.5 dBA. Locations 1 and 2 are shielded from traffic by a sound wall on SJHTC. Location 4 was blocked mostly from the SJHTC traffic and blocked completely from construction activities west of the project area. The measured noise levels at Locations 3, 7, and 8 were due primarily to a combination of traffic, birds, and construction equipment operation noise. A large residential project site approximately 1,000 feet west and northwest of these locations was in construction during the monitoring periods (both AM and PM). The equivalent continuous noise levels (Leq) were 49 to 55 dBA. The average noise levels (Leq) at Locations 5 and 6, at the bottom of the embankment/wall along the SJHTC were 51 to 55 dBA. The measured noise levels were due to birds, roadway traffic, and light construction equipment noise.

1999

The monitored Leq values of 55.7 to 62.4 dBA measured at Locations 1, 2, and 4 were due mainly to construction activities southeast of the SJHTC and Bonita Canyon Road/New Ford Road. Secondary sources of noise included traffic on Bonita Canyon Road/New Ford Road, aircraft, and nearby bird

call sounds. Locations 1 and 2 are shielded by a sound wall, and Location 4 was blocked mostly from SJHTC traffic. Moderate traffic was observed on Bonita Canyon Road/New Ford Road March 21, 2001, during the noise monitoring intervals. The measured noise levels at Locations 3, 7, and 8 were due primarily to construction activities at an adjacent site. Traffic, aircraft, and birds contributed to secondary measured ambient noise. The equivalent continuous noise levels (Leq) ranged from 57.3 to 60.5 dBA. The average noise levels (Leq) at Locations 5 and 6 at the bottom of the embankment/wall along the SJHTC were 57.3 to 64.7 dBA. The measured noise levels were due mainly to construction at an adjacent site, with aircraft, birds, and roadway traffic as secondary noise sources.

2000

The noise levels measured at Locations 1, 2, and 4 were due mainly to construction activities southeast of the SJHTC and Bonita Canyon Road/New Ford Road. Traffic on Bonita Canyon Road/New Ford Road, aircraft, and nearby bird sounds were the secondary sources of noise during the noise monitoring periods. Construction noise dominated the monitored Leq values of 55.7 to 62.4 dBA. Locations 1 and 2 are shielded by a sound wall from traffic on SJHTC, and Location 4 was blocked mostly from the SJHTC traffic. During the noise monitoring intervals, traffic on Bonita Canyon Road/New Ford Road was observed to be moderate. Construction activities at an adjacent site were the dominant source of noise in the project vicinity. The equivalent continuous measured noise levels (Leq) at Locations 3, 7, and 8 were due primarily to construction activities at an adjacent site (except after 4:30 p.m.) and ranged from 57.3 to 60.5 dBA. Traffic, aircraft, and birds also contributed to the measured ambient noise. The average noise levels (Leq) at Locations 5 and 6 at the bottom of the embankment/wall along the SJHTC were 57.3 to 64.7 dBA. The measured noise levels were due mainly to construction at an adjacent site, with aircraft, birds, and roadway traffic as secondary noise sources.

CONCLUSION

Noise level surveys were conducted in the Bonita Reservoir wildlife habitat area during each year from 1996 through 2000. The noise monitoring surveys conducted in 1996, 1997, and 2000 occasionally exceeded the 60 dBA Leq monitored noise level criterion, which has been used for wildlife habitat areas. Field observation during noise monitoring periods showed that temporary construction noise was the primary source of noise levels above 60 dBA Leq. Noise associated with roadway traffic was below 60 dBA Leq at all times.

During the 1996 noise monitoring survey, the monitored noise levels at one of the four noise monitoring locations, mainly from construction sources at an adjacent site, were higher than the 60 dBA Leq criterion recommended for wildlife habitat areas. However, excluding the construction noise, all four monitoring sites would have noise levels below 60 dBA Leq. Noise associated with the construction activity would cease once construction at the adjacent site was complete. The noise samples and observations at the four measurement locations clearly indicated that the noise levels were dominated by sources other than roadway traffic, and there was no correlation to traffic noise based on either time of day or distance from Bonita Canyon Road. As with the baseline measurements, the traffic noise sources were not indicative of the projected ultimate traffic volumes.

During the 1997 noise monitoring survey, the monitored noise levels at three of the eight noise monitoring locations, mainly from construction activities at an adjacent site, were higher than the 60 dBA Leq criterion, which has been used for wildlife habitat areas. For the year 2000, the monitored noise levels at six of the eight noise monitoring locations, also primarily from construction activities at an adjacent site, were higher than the 60 dBA Leq level. Without the construction noise, all eight monitoring sites would have noise levels below 60 dBA Leq. Noise associated with the construction activity would cease once construction at the adjacent site is completed.

Traffic noise at these noise monitoring locations was lower than predicted noise levels (60 dBA Leq), due to either less than projected traffic rates at the time of noise monitoring or additional shielding not accounted for in the original projection of traffic noise.

Although it is difficult to directly relate the effects of noise on breeding birds, no adverse effects were observed during the periods of noise levels higher than 60 dBA Leq (i.e., during periods of construction activity) as evidenced by the number of California gnatcatchers and least Bell's vireos remaining in this area. In fact, in 2000, a least Bell's vireo pair successfully nested in the portion of Bonita Reservoir that was nearest the construction activity.

WILDLIFE MOVEMENT

STUDY AREA

The wildlife movement study area is located approximately 0.25 mile west of the intersection of Bonita Canyon Road and Newport Coast Drive - Township 6 South, Range 9 West, Section 91 (Figures 1 and 2). The primary portion of the study area is bounded on the north and east by the SJHTC alignment, and on the south by Bonita Canyon Road; the western end of this more or less triangular study area is the open space land included as part of the SJHTC and Church of Jesus Christ of Latter Day Saints open space dedication programs. However, tracking surveys and scent station studies extended approximately 1,000 feet into the undeveloped area south of Bonita Canyon Road.

METHODS

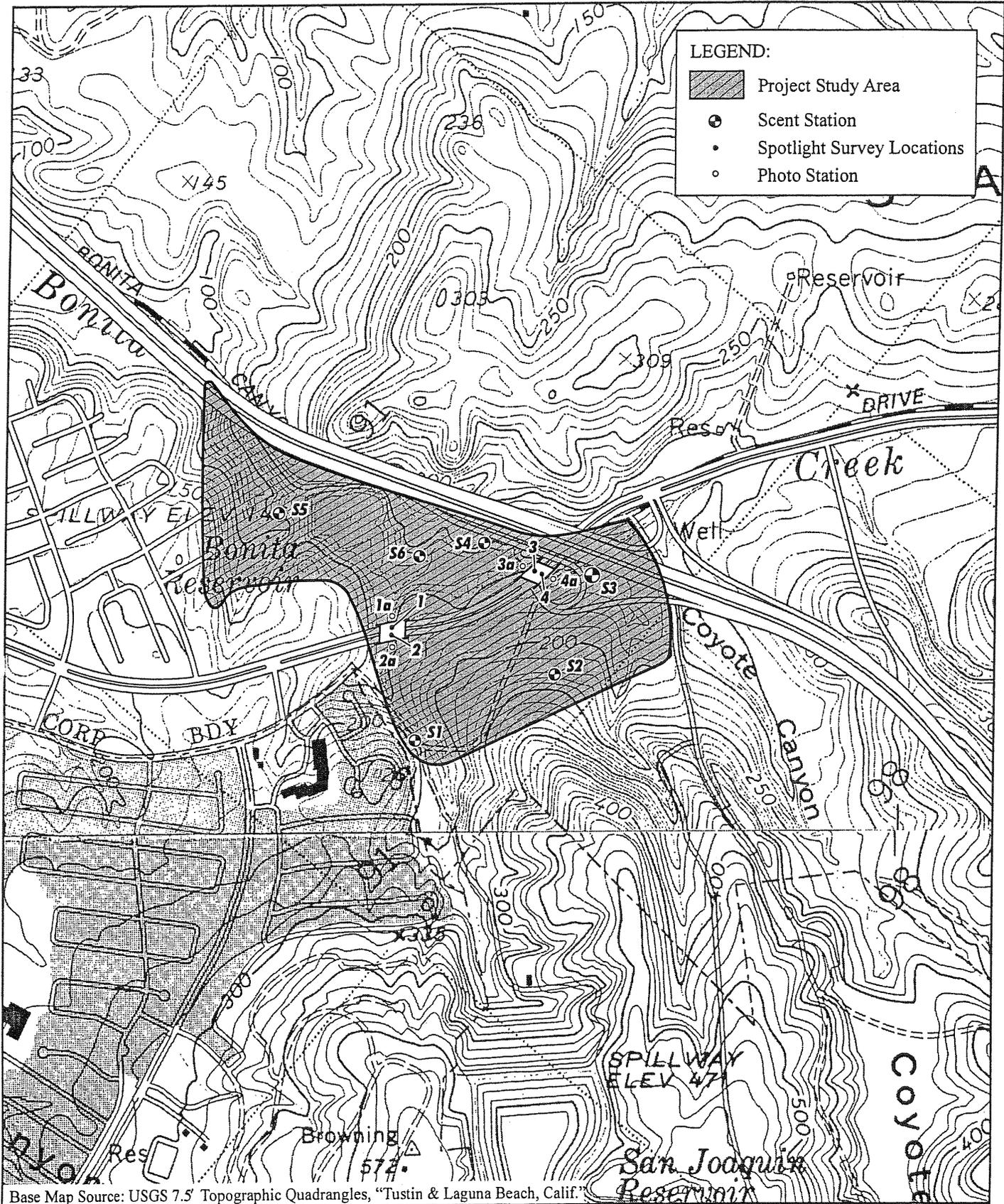
The scent station and general track and scat survey portions of the wildlife corridor study are a continuation of the annual studies initially conducted by the Chambers Group (1995a), prior to the realignment of Bonita Canyon Road and again by LSA (1996, 1997, 1998, and 1999). The LSA portions of the study (i.e., automated photo stations and spotlight surveys) were included in an effort to document additional wildlife use of the undercrossings and the study area as a whole. Surveys were conducted for the final annual study between April 11, 2000, and April 16, 2000.

Spotlight Surveys

Spotlight surveys were conducted from the bridges away from the two wildlife undercrossings each night of scent station operation. A 2,000,000 candlepower spotlight was used for the surveys. The surveys did not begin until full dark and consisted of a person standing on one side of the bridge, at the midpoint, and scanning the habitat below (with a spotlight) for approximately five minutes. The survey was conducted by first scanning the area directly below the edge of the bridge, moving the spotlight in slow, sweeping, side to side arcs, and working outward until the surveyor could no longer clearly identify the vegetation; at this time, the surveyor began scanning back toward the bridge. This sequence continued until the time limit had expired. The genus and/or species of each sighting was recorded. The location of each sighting was determined by estimating the distance and direction (using a compass) from the center of the bridge. Each side of both bridges was surveyed each night (i.e., 20 minutes of surveying per night).

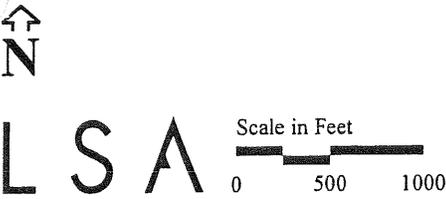
Scent Stations

Six scent stations were established within the study area (Figures 2-4). One scent station was located at each end of the two Bonita Canyon Road undercrossings, and one station was located within 1,000



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Figure 4



feet of the road on both the north and south sides. The scent stations were established as near as possible to the locations in the initial survey (Chambers Group 1995a). Scent station numbers two, three, and five were relocated due to construction on the previous site. The sites were relocated to the nearest patch of vegetation in close proximity to the old scent stations.

The center of each scent station was marked with a 1x4 inch by 3 foot wooden stake, and the number of the scent station was clearly written on the stake with an indelible marker. All vegetation that immediately surrounded the scent station was cleared to allow for a clear print in the tracking medium. A thin bed of diatomaceous earth was spread around the station to aid in identifying tracks.

The bait consisted of tuna flavored cat food and an oats/seed mix. One can of cat food was placed at each station, and four holes were punched in the top and bottom (with the piercing end of a can opener) to allow the scent to disperse. The can was secured to the stake in the center of the station with baling wire. A length of wire was threaded through a top and bottom hole, tied off, and then the other end was attached to the stake. The oats/seed mix was placed in the center of an approximately 8x8 inch square of screen mesh, the corners pulled together and fastened with one end of a length of baling wire, and the entire package secured to the stake with the other end.

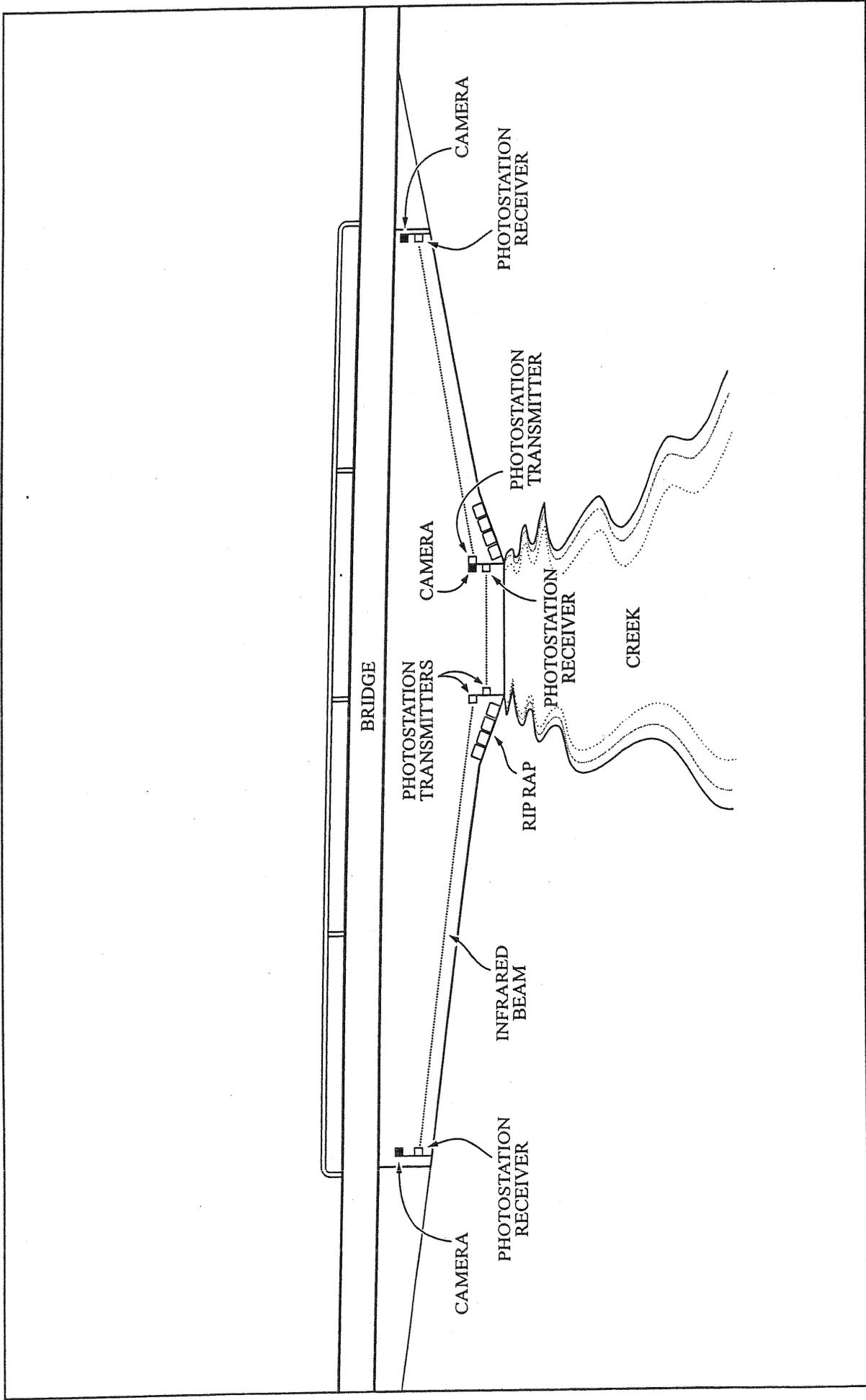
Each scent station was checked every morning during the survey period, and all clearly identifiable tracks at each station were recorded by genus and species, where possible. The cat food was replaced daily to prevent it from drying out and exuding less odor, which could decrease the probability of an animal visiting the station. However, the oats/seed mix was invariably dry and was replaced only if the screen was damaged or the bait soiled (e.g., with urine or feces). In addition, the diatomaceous earth was reapplied or smoothed each morning, just prior to leaving the station.

Automated Photo Stations

Automated photo stations (Trail Master Infrared Trail Monitor) were set up at each end of the two wildlife undercrossings (i.e., eight stations), as shown in Figures 2-4. Due to the configuration of the westernmost creek undercrossing, three units were used to fully cover the entire crossing. The units were positioned to cover each of the steep side slopes as well as the creek bottom (Figure 5). The terrain beneath the eastern undercrossing monitored by photo stations #3 and #4 is flat and, as a result, the sensing units were capable of detecting movement across the entire expanse of the undercrossing from one side. Consequently, each station was set up on one side of the undercrossing, next to the bridge foundation, and directed across the expanse toward the edge of the creek.

Each station consisted of an infrared sensing unit (sender and receiver) and a camera, with a cord connecting the two. Both pieces of the sensing unit and the camera were mounted to 1x4 inch by 3 foot wooden stakes, which were positioned to detect movement within the desired area. In addition, the height of both pieces of the sensing unit was adjusted to target medium to large mammals (e.g., raccoons, coyotes, etc.). Excess cord connecting the receiving unit and the camera was fastened to one of the stakes, up off the ground, to prevent damage by rodents.

Each photo station was checked every morning during the survey period, and the roll number and frame position were recorded at the conclusion of each roll of film.



4/23/01(TCA504)

Figure 5

LSA

Undercrossing Profile

General Track and Scat Surveys

General surveys for tracks and scat were conducted throughout the study area each morning after the scent and photo stations were checked. These surveys consisted of a person walking through the entire study area and observing the ground for tracks and fresh scat. The surveyor was also alert for direct observations of animals. In addition, the surveyor visited those areas where any sightings occurred during the spotlight survey the previous night, and attempted to confirm the sighting with track identification. All clearly identifiable tracks and scat were recorded by genus and species where possible and by approximate location. The vast majority of the substrate was either too hard (dry) or too moist to facilitate smoothing those areas containing tracks, in order to observe any fresh tracks during the next survey.

RESULTS

The results of the scent station, photo station, and spotlight surveys are summarized in Tables B-D. The species for which tracks and scat were observed away from the scent stations but within the study area are provided in Table E.

In addition to observations of track and/or scat from the species listed in the tables, additional auditory and/or visual observations were made of California quail (*Callipepla californica*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), American kestrel (*Falco sparverius*), mourning dove (*Zenaidura macroura*), Anna's hummingbird (*Calypte anna*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), northern mockingbird (*Mimus polyglottos*), tree swallow (*Tachycineta bicolor*), cliff swallow (*Petrochelidon pyrrhonota*), coastal California gnatcatcher (*Poliophtila californica californica*), California towhee (*Pipilo crissalis*), common yellowthroat (*Geothlypis trichas*), white-crowned sparrow (*Zonotrichia leucophrys*), rufous-crowned sparrow (*Aimophila ruficeps*), house finch (*Carpodacus mexicanus*), and numerous other songbirds.

Discussion

During the year 2000 spotlight surveys, eight animals were recorded, including one bobcat and seven Audubon's cottontail, which was the largest number of animals recorded during the five year study. The number of animals observed each year varies greatly, probably due to the chance that an animal will be in the visible area during the relatively short sampling period. However, the spotlight data are valuable, since the presence of animals in the vicinity of the crossing that may not be recorded at either the scent stations or the photo stations is shown.

A total of 30 animals was recorded at the six scent stations, with each station recording between four and six individual animals during the 2000 study. The scent stations recorded such animals as unidentified small birds and rodents, as well as coyotes and bobcats. During the 2000 study, most of the medium mammal (coyote, bobcat, and racoon) activity was recorded at scent stations one and five, which are at either end of the larger of the two crossings (western crossing). This is not the case during all five years, where the most active scent stations used by medium mammals vary widely.

Table B: Spotlight Station Data

2000	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
Audubon's cottontail	<i>Sylvilagus audubonii</i>	5	1		1	7
bobcat	<i>Felis rufus</i>	1				1
Total		6	1	0	1	8

1999	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
Audubon's cottontail	<i>Sylvilagus audubonii</i>	1				1
great horned owl	<i>Bubo virginianus</i>		1			1
Total		1	1	0	0	2

1998	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
Audubon's cottontail	<i>Sylvilagus audubonii</i>		2			2

1997	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
No Species Observed						0

1996	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
Audubon's cottontail	<i>Sylvilagus audubonii</i>	1	3			4
woodrat	<i>Neotoma sp.</i>		1			1
Total		1	4	0	0	5

Table C: Scent Station Data

2000	Species Observed	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Total
unidentified bird			1		3			4
Virginia opossum	<i>Didelphis virginianus</i>					3		3
Audubon's cottontail	<i>Sylvilagus audubonii</i>	1	1	3			5	10
unidentified small rodents			4	2				6
striped skunk	<i>Mephitis mephitis</i>				1			1
raccoon	<i>Procyon lotor</i>	1				1		2
coyote	<i>Canis latrans</i>	1		1		1		3
bobcat	<i>Felis rufus</i>	1						1
Total		4	6	6	4	5	5	30

1999	Species Observed	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Total
unidentified bird				1				1
Virginia opossum	<i>Didelphis virginianus</i>				2	1		3
Audubon's cottontail	<i>Sylvilagus audubonii</i>	5	4		1		4	14
unidentified small rodents			1			2	2	5
woodrat	<i>Neotoma sp.</i>				3			3
striped skunk	<i>Mephitis mephitis</i>	1			2			3
raccoon	<i>Procyon lotor</i>				1			1
Total		6	5	1	9	3	6	30

1998	Species Observed	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Total
Common raven	<i>Corvus corax</i>		1					1
Audubon's cottontail	<i>Sylvilagus audubonii</i>	2	4			1		7
unidentified small rodents		1	2					3
spotted skunk	<i>Spilogale gracilis</i>		1					1
Total		3	8	0	0	1	0	12

1997	Species Observed	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Total
unidentified bird								0
Virginia opossum	<i>Didelphis virginianus</i>							0
Audubon's cottontail	<i>Sylvilagus audubonii</i>	2	1			2	6	11
unidentified small rodents								0
woodrat	<i>Neotoma sp.</i>	1		1			1	3
spotted skunk	<i>Spilogale gracilis</i>						1	1
striped skunk	<i>Mephitis mephitis</i>							0
raccoon	<i>Procyon lotor</i>				2			2
coyote	<i>Canis latrans</i>	2						2
bobcat	<i>Felis rufus</i>						1	1
Total		5	1	1	2	2	9	20

1996	Species Observed	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Total
Audubon's cottontail	<i>Sylvilagus audubonii</i>	1		2	1	1		5
California ground squirrel	<i>Spermophilus beecheyi</i>				1			1
Pacific kangaroo rat	<i>Dipodomys agilis</i>			1	3			4
woodrat	<i>Neotoma sp.</i>				2			2
rat	<i>Rattus sp.</i>				1			1
spotted skunk	<i>Spilogale gracilis</i>				1			1
striped skunk	<i>Mephitis mephitis</i>						2	2
raccoon	<i>Procyon lotor</i>	1			2	2		5
coyote	<i>Canis latrans</i>				1	1	3	5
bobcat	<i>Felis rufus</i>				1	1	2	4
Total		2	0	3	13	5	7	30

Table D: Photo Station Data

2000	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
American crow	<i>Corvus brachyrhynchos</i>	2		2		4
greater roadrunner	<i>Geococcyx californianus</i>		1			1
Audubon's cottontail	<i>Sylvilagus audubonii</i>		8		1	8
coyote	<i>Canis latrans</i>	9	6	4	6	19
raccoon	<i>Procyon lotor</i>			3		3
		11	15	9	7	35

1999	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
mallard	<i>Anas platyrhynchos</i>	1	1			2
great egret	<i>Ardea alba</i>					0
coyote	<i>Canis latrans</i>	1		1	2	4
raccoon	<i>Procyon lotor</i>	3				3
		5	1	1	2	9

1998	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
coyote	<i>Canis latrans</i>	5				5

1997	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
Audubon's cottontail	<i>Sylvilagus audubonii</i>			5		5
coyote	<i>Canis latrans</i>	1	4			5
raccoon	<i>Procyon lotor</i>			1		1
bobcat	<i>Felis rufus</i>	1	1	2	1	5
		2	5	8	1	16

1996	Species Observed	Station 1	Station 2	Station 3	Station 4	Total
Audubon's cottontail	<i>Sylvilagus audubonii</i>				3	3
coyote	<i>Canis latrans</i>	5	1			6
raccoon	<i>Procyon lotor</i>		4			4
bobcat	<i>Felis rufus</i>	2				2
		7	5	0	3	15

Table E: General Track and Scat Surveys

Common Name	Scientific Name	1996	1997	1998	1999	2000
mallard	<i>Anas platyrhynchos</i>	T	T	T/S	T	T
great blue heron	<i>Ardea herodias</i>			T/S		
heron	<i>Ardeidae (Family)</i>	T				
great egret	<i>Ardea alba</i>				T	T
greater roadrunner	<i>Geococcyx californianus</i>	T				
Audubon's cottontail	<i>Sylvilagus audubonii</i>	T/S	T/S	T/S	T/S	T/S
Pacific kangaroo rat	<i>Dipodomys agilis</i>				T	
striped skunk	<i>Mephitis mephitis</i>				T	T
coyote	<i>Canis latrans</i>	T/S	T/S	T/S	T/S	T/S
raccoon	<i>Procyon lotor</i>	T	T	T	T	T
bobcat	<i>Felis rufus</i>	T	T	T/S	T	T
muledeer	<i>Odocoileus hemionus</i>	T		T/S		

However, scent stations two and three maintained relatively low use throughout the five year study, probably due to the lack of vegetative cover compared to the other scent stations and to the large amount of human activity in the area.

The most wildlife activity was recorded by the undercrossing photo stations during the 2000 study, with a total of 35 animals recorded, of which 22 were medium mammals (samples photos in Figures 6-8). The coyote is recorded the most during each year; however, the amount of coyote activity was substantially greater during 2000 than in any other year. This increase in activity may be due to the commencement during 2000 of the mass grading of Newport Ridge, the large development directly adjacent to the south of the crossing. Although some of the animals were recorded at both sides of the undercrossing, demonstrating movement of animals across the entire undercrossing, as opposed to being recorded at only one side of the crossing, the animals that are recorded only on one side of the crossing may be due to a number of factors. These animals may be less comfortable or motivated to use the crossing, and the camera flash from the photo station appears to startle many of the animals, especially the coyotes, which may react by either retreating the way they came or running through the photo station on the opposite side of the crossing. The animals may return at a later time to reattempt the crossing.

Throughout the five years, most of the animals were recorded at the photo stations on the north side of the crossing, perhaps because Bonita Reservoir on the north side of the project has relatively mature vegetation and is the largest piece of core riparian habitat in the Bonita Creek and Coyote Creek watershed, whereas there is less cover and habitat on the opposite end of the undercrossing. In addition, the photo stations at the western crossing recorded more wildlife activity than the eastern crossing, probably because it is a natural drainage with relatively mature vegetation at the entrance on either side.

Overall, the diversity of species found during the track and scat survey has been consistent through the years. The primary difference among the years is the observation of mule deer tracks and scat. Although mule deer (*Odocoileus hemionus*) tracks were observed during previous studies (1996 and 1998), none were observed during the last two studies.

Although we would expect the amount of wildlife usage at the crossing to increase over time as a result of familiarity and behavior conditioning, other factors may offset this tendency by reducing the size of the wildlife population in the area. These include habitat loss, adverse weather patterns, natural population fluctuations, and human activity and disturbance. We suspect that the greatest factors are loss of overall habitat in the watershed and the weather. Two large residential developments during the five year study, including Newport Ridge directly to the south of Bonita Canyon Road and Bonita Village to the west of Bonita Reservoir, have removed approximately half of the natural open space in the watershed. Consequently the size of the overall wildlife population is expected to have decreased with the loss of habitat. Because of the reduced foraging area on either side of the crossing, individuals may be forced to travel upstream and downstream more frequently, resulting in higher use of the undercrossings. Although the Coyote Canyon Landfill and San Joaquin Reservoirs were intended to provide linkage to the rest of the NCCP Reserve, chain-link fences at these facilities may impede wildlife movement, resulting in an isolated finger of the San Diego Creek watershed.



Greater roadrunner at Photo Station 2 at 15:34 on 4/12/00.



Two Audubon's cottontails at Photo Station 4 at 06:37 on 4/16/00.

4/19/01(TCA504)

Figure 6

LSA

Sample Wildlife Photos



A coyote at Photo Station 1 at 15:56 on 4/12/00.



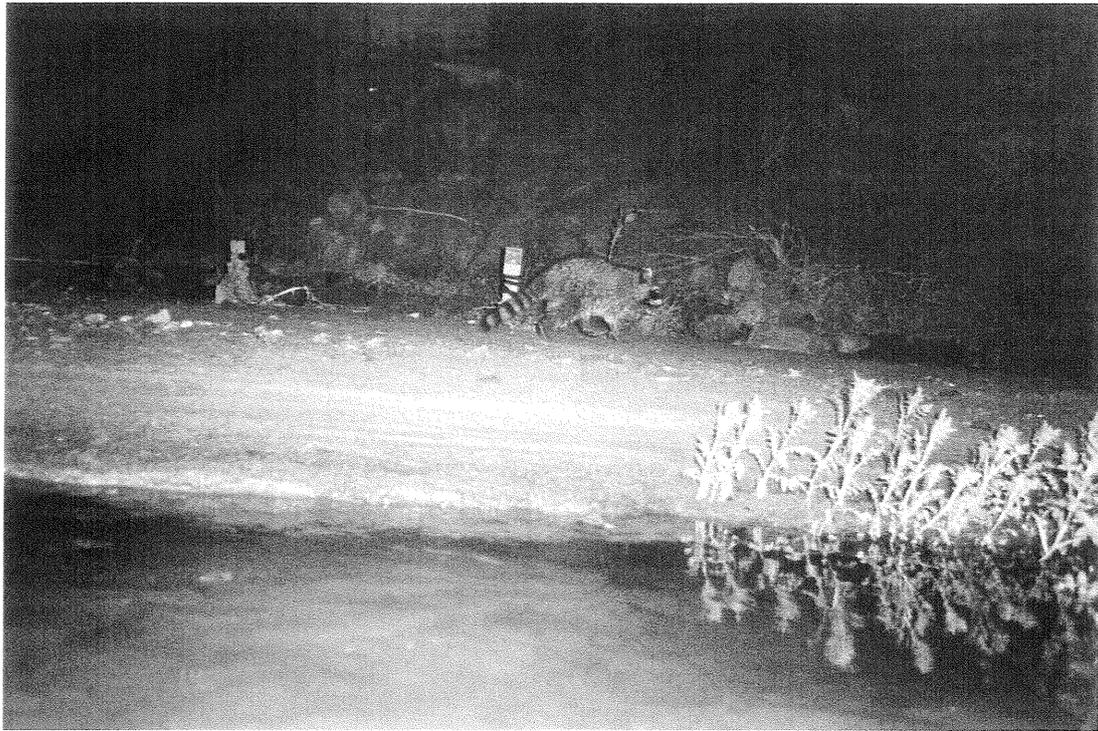
A coyote at Photo Station 2 at 21:27 on 4/15/00.

4/19/01(TCA504)

Figure 7

LSA

Sample Wildlife Photos



A raccoon at Photo Station 1 at 05:19 on 4/14/00.



A bobcat at Photo Station 4 at 19:48 on 4/3/97.

4/19/01(TCA504)

Figure 8

LSA

Sample Wildlife Photos

Another major factor that may have had an affect on the fluctuation of the wildlife population and movement at the undercrossings is variable weather during the last five years, which includes several years of normal rainfall followed by above and below average rainfall as a result of the El Niño and La Niña conditions. The number of animals recorded at and adjacent to the crossing was the lowest during 1998, which was a year that El Niño conditions were present. The overall herbivore populations fluctuate based on the amount of available forage, and predator populations are subsequently affected.

Also, human activity and disturbance may have affected the amount and species of wildlife using the area and crossings. The two construction projects mentioned above brought an increase in the amount of vehicle traffic and general activities. Those animals that are more adaptable to human activities, like coyotes and racoons, have been able to persist, as opposed to mule deer and bobcat, which may be more susceptible to human activity and disturbance. Coyotes are able to adapt readily to the human activity; in some cases, it may increase their presence because they are both scavengers and curious in nature. During the construction of Newport Ridge, the amount of traffic, food trash, and equipment may have attracted more coyotes to the site, resulting in a higher use of the wildlife undercrossing.

One other factor has physically affected the function of the undercrossings; over the years these two crossings have been subject to substantial silt deposits as a result of upstream activity. The silt deposits have modified the overall appearance and characteristic of the two crossings. The height of the eastern crossing has been reduced by several feet throughout the years as a result of the silt buildup from upstream activity. At the beginning of the study, the bottom of the eastern crossing was relatively flat, with a slight drainage on the east side. Subsequently, the silt has built up the undercrossing, creating sand bar that causes the water to pond at the undercrossing. The bottom of the undercrossing is usually extremely saturated, making it difficult to traverse during portions of the year. The amount of willows and mulefat on both sides of the eastern most crossing has increased, making the entrance less visible to those animals that are insecure about traveling in the open. The shape of the western crossing was generally an inverted trapezoid with a steep sided riprap channel in the center. The silt has filled up the riprap channel, giving it a more natural appearance. The amount of flat area on the bottom has increased, making the channel easier to traverse. Most of the animals were recorded either in the riprap channel or the bottom of the inverted trapezoid as opposed to the steep sides of the trapezoid. It appears that this silt deposit has made the undercrossing easier to traverse, due to the wider and more gradual bottom. Also, in conjunction with the construction of Newport Ridge the entrances to the undercrossings are being revegetated, providing more vegetative cover for animals while they travel.

CONCLUSION

The two wildlife undercrossings are successful at allowing medium to large wildlife to move across Bonita Canyon Road. Throughout the five year period, the wildlife has been documented regularly utilizing the undercrossings with success. These undercrossings provide an undisturbed crossing point to cross the road safely without risking injury by cars or being impeded by traffic. Although there is some variability in the number and diversity of wildlife that utilize the undercrossing, the variability seems to be affected by factors outside of the control of TCA.

These studies provide useful information on the effects of Bonita Canyon Road and the SJHTC, as well as the effectiveness of the wildlife undercrossings. However, as noted above, the results of this study are not solely affected by the impacts of the SJHTC and Bonita Canyon Road, but rather are influenced by the cumulative impacts to the watershed as a whole and the resultant separation from other populations. The deer population in the area has probably been adversely affected by the reduction in habitat as well as human activity. However, the crossings seem to have great benefit for medium to small mammals, particularly coyotes and other predators, for which they were primarily designed.

While many factors may have affected wildlife populations in the vicinity of the crossings, the functions of the crossings have not been adversely affected.

CALIFORNIA GNATCATCHERS

California gnatcatchers (*Polioptila californica californica*) were monitored by LSA in the Bonita Canyon Road area from 1996-2000. Annual reports for previous years were prepared by LSA (1997, 1998a, 1998b, 1999). The Chambers Group monitored the same area in 1994 and 1995. The primary task was to obtain an accurate assessment of gnatcatcher use of the Bonita Canyon Road area during the nesting season, with supplemental observations made throughout the year. Additional tasks included color banding of selected individual gnatcatchers and a post-season reconnaissance level survey of the Bonita Canyon Road area, University of California, Irvine Ecological Reserve, Upper Newport Bay, and vicinity. With the use of a Geographic Information System (GIS), vegetation and land use changes over the period 1990-2000 were analyzed and compared to gnatcatcher population dynamics.

METHODS

The Bonita Canyon Road California gnatcatcher study area is approximately 480 acres and roughly triangular in shape. It is bounded on the northeast by the San Joaquin Hills Transportation Corridor, on the west by MacArthur Boulevard, and on the south by (new) Ford Road and a line from the east end of Ford Road sweeping south to include the Pelican Hill Road wetland mitigation site and connecting with the old Coyote Canyon landfill access road (Figure 1). Partial data collected in 1994 and 1995 by the Chambers Group (1995b, 1996) are also incorporated in this report.

Monitoring duties were shared with Chambers Group biologists in 1996, but in subsequent years LSA was responsible for all monitoring activities, with considerable assistance provided by subconsultant David Bontrager. Mr. Bontrager also provided information on California gnatcatchers from nearby areas, as did other biologists working in the general area (primarily associated with Harmsworth Associates). From 1998-2000, LSA's monthly monitoring of TCA restoration sites near Bonita Reservoir allowed for supplemental observations not possible in 1996 and 1997.

The numbers for gnatcatcher territories 1-22 were established by the Chambers Group (1995b) in 1994 and followed in 1995 (Chambers Group 1996). Numbers for additional territories were added each year, and the prefix "BNCY" (for Bonita Canyon) was added to all, to conform to David Bontrager's numbering system for the entire San Joaquin Hills area (cf. Bontrager et al. 1996, 1997).

Color banding of individual gnatcatchers was done to more accurately monitor nesting success in the Bonita Canyon Road area and to detect dispersal of young birds within and out of the area. Gnatcatchers were banded either in the nest prior to fledging or following capture in a fine black mist net. Each bird was examined in the hand and fitted with a unique combination of colored plastic bands and a numbered U.S. Fish & Wildlife Service aluminum band. Banded birds could then be individually identified in the field. Following Bontrager's method, band combinations are read from left to right and top to bottom, with the bird facing the observer. Thus, R-MW indicates a bird with a

red band on its right tarsus and a metal band over a white band on its left tarsus. All colors used are listed in Appendix A.

Because the Bonita Canyon Road area serves as a link between the relatively isolated gnatcatcher population at Upper Newport Bay and the more extensive population in the San Joaquin Hills, it is important for the study of this bird's dispersal capabilities at the urban interface. Each fall (mid-September - early November), following completion of the nesting season, reconnaissance surveys were conducted in the Bonita Canyon Road/UCI area and around Upper Newport Bay (Figure 1), searching for gnatcatchers that had been color banded for this study or others underway elsewhere in the San Joaquin Hills.

At the completion of the field studies, a collection of aerial photographs was used to prepare habitat maps for each year from 1990 to 2000. The County of Orange habitat classification system (Gray and Bramlet 1992) was followed. Prior to this time, territory boundaries and nest locations had been mapped. All of these data were digitized and entered into LSA's GIS for analysis.

RESULTS

Population Status and Reproductive Success

Complete details of California gnatcatcher reproductive activities are shown in Appendices A-E. There are various ways to measure the success of any site for any species in any year. Table F includes some of the most common: number of pairs present, number of pairs nesting successfully, number of young fledged, and ratio of young fledged per nesting pairs. These measures are all interrelated and often are inversely related (e.g., more birds nesting on site may result in fewer fledglings produced per pair).

In the Bonita Canyon Road study area, the number of nesting gnatcatchers ranged from 9-24 pairs from 1994-2000. Territory locations, years of occupation, and number of young fledged are shown in Figure 9. Each year, mated pairs occupied most territories, but there were a few cases where lone males occupied territories. There was also evidence of the presence of "floaters," individuals not attached to any territory and available to take the place of pair members lost during the nesting season. Gnatcatchers are much less territorial outside the nesting season and range over considerably larger areas, resulting in more overlapping of territories.

Each year, almost all pairs engaged in nesting activities; however, there were several instances where no nesting evidence was obtained for certain pairs throughout the entire season. The number of pairs nesting successfully ranged from 7-16 (50-83 percent of pairs present), and increased annually from 1996-2000. Although most pairs attempted multiple nesting each season, only rarely were pairs able to fledge young from two broods. The number of young fledged each year varied from a low of 25 in 1995 to a high of 54-65 in 2000; the range of fledglings per pair was from 1.6-1.8 in 1996 to 3.0-3.6 in 2000.

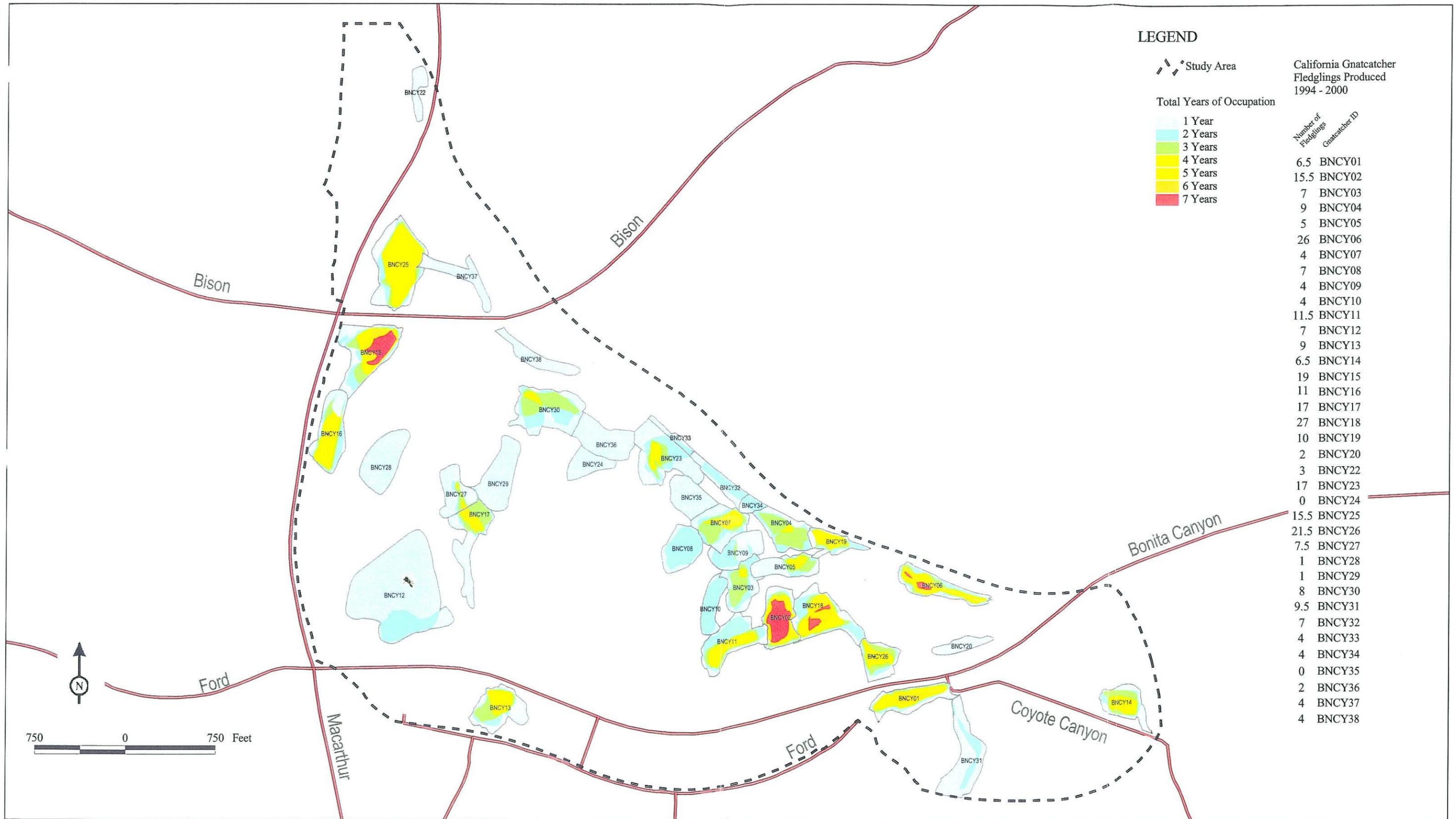
Table F: California Gnatcatcher Reproductive Success, 1994-2000

	1994 ¹	1995 ²	1996	1997	1998	1999	2000	mean
Pairs Present	22	9	24	20	16	21	18	18.6
Pairs Nesting Successfully/ Percentage	13 59%	7 78%	12 50%	12 60%	12 75%	16 76%	15 83%	12.4 69%
Mean Clutch Size ³ /n	na	na	3.5 (21)	3.5 (19)	3.8 (17)	3.4 (25)	3.8 (30)	3.6
Hatching Success ³ (eggs hatched/eggs laid)	na	na	86% 63/73	70% 47/67	52% 26/50	75% 53/71	73% 87/119	71%
Fledging Success ³ (young fledged/eggs laid)	na	na	51-56% 37-41/73	51-55% 34-37/67	43-49% 28-32/65	60-76% 51-65/85	41-50% 54-65/131	53%
Total Young Fledged	46	25	39-44	48-56	44-51	51-65	54-65	47
Fledgings/Pair	2.1	2.8	1.6-1.8	2.4-2.8	2.8-3.2	2.4-3.1	3.0-3.6	2.6

¹ Data from Chambers Group (1995b, Table 1).

² Data from Chambers Group (1996, Table 1).

³ Based on partial data, as the specifics of many nesting attempts were not obtained.



LSA

Figure 9

California Gnatcatcher Territories, Years of Occupation (1994-2000), and Number of Young Fledged (1996-2000)

Because a failed nesting attempt may occur in a short period of time, while successful nesting requires several weeks, it is much easier for failed nesting attempts to go undetected. Over the course of the study, only 41 percent of nests found were successful (Table G). Thus, more frequent territory monitoring probably would have lowered the estimation of hatching success (eggs hatched/eggs laid) and fledging success (young fledged/eggs laid), but could only have increased overall success as measured by fledglings per pair. No nest parasitism by brown-headed cowbirds (*Molothrus ater*) was observed during the entire five years that LSA monitored the study area. Indeed, almost no free-flying cowbirds were observed in the study area. Nest predation occurred each year, but the only specific observation occurred on June 13, 1996, when a common kingsnake (*Lampropeltis getulus*) was found just after consuming the contents of a nest in BNCY26 (Appendix A).

Land Use/Habitat Changes and Habitat Use

Land Use/Habitat Changes. Table H outlines the habitat changes in the study area since 1990; habitat maps for 1990, 1995, and 2000 are on Figures 10-12. The most significant changes involve the reduction in annual grassland from about 300 acres to less than ten and the increase in paved roads and urban development from 16 acres to almost 260 (cf. Figures 10 and 12). The amount of scrub habitat remained fairly stable, increasing from an original 80 acres to a high of 100 acres in 1993 before decreasing to an eventual 64 acres. Figure 11 shows the situation in 1995, at the height of construction of the SJHTC. Figure 13 shows territory and nest locations during the final year of the study.

Habitat Use

Table I shows the habitat within occupied gnatcatcher territories during the LSA study, from 1996-2000. Precise territory boundaries are not available for previous years. The amount of habitat occupied fell from over 52 acres initially to a low of less than 29 acres in 1998, before rebounding to 43 acres in 2000. Because coastal sage scrub exists within a mosaic of habitats, a variety of habitats is found within occupied territories. More sagebrush-buckwheat scrub was occupied than any other habitat. Nest placement within habitat is shown in Table G, where the host plant species for 151 nests is shown. Most nests were placed in California sagebrush (*Artemisia californica*; 64 percent), followed by California encelia (*Encelia californica*; 13 percent), big saltbush (*Atriplex lentiformis*; 8 percent), and nine other species (15 percent).

Color Banding and Movement Study

A total of 244 gnatcatchers were color-banded on the study site from 1996-2000, 62 adults and 182 young. Eight more young birds were banded on the site in 2000 by Dana Kamada (for Harmsworth Associates) and another 14 banded birds from other sites relocated to the Bonita Canyon Road study area (Figure 14). Movement within the study area is shown for each year in Figure 15, sheets 1-5. Note that some of the "local movements" within the study area were actually greater than some of the "regional movements" between the study area and the UCI Reserve. Additional movement of banded birds from Sand Canyon Reservoir and the UCI Reserve to Upper Newport Bay was confirmed

Table G. California Gnatcatcher Nesting Substrates, 1996-2000

Plant Species	1996			1997			1998			1999			2000			1996-2000		
	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)
California sagebrush	13	4	13-14	22	9	27-30	14	7	22-26	23	11	26-34	24	10	33-37	96	41	121-
<i>Artemisia californicus</i>	59%	31%	1.0-1.1	61%	41%	1.2-1.4	48%	50%	1.6-1.9	77%	48%	1.1-1.5	71%	42%	1.4-1.5	64%	44%	141
California encelia	2	0	0	4	2	7-8	6	1	4	2	0	0	5	1	3-4	19	4	14-16
<i>Encelia californica</i>	9%			11%	50%	1.8-2.0	21%	17%	0.7	7%			15%	20%	0.6-0.8	13%	21%	0.7-0.8
Big saltbush	2	0	0	3	1	3-4	4	3	10-13	1	1	3	2	0	0	12	5	16-20
<i>Atriplex lentiformis</i>	9%			8%	33%	1.0-1.3	14%	75%	2.5-3.3	3%	100%	3.0	6%			8%	42%	1.3-1.7
Goldenbush	1	1	3				3	1	3-4	1	1	3	1	0	0	6	3	9-10
<i>Isocoma menziesii</i>	5%	100%					10%	33%	1.0-1.3	3%	100%	3.0	3%			4%	50%	1.5-1.7
California buckwheat	1	1	1-3	1	0	0	2	1	2-4	1	0	0				5	2	3-7
<i>Eriogonum fasciculatum</i>	5%	100%		3%			7%	50%	1.0-2.0	3%						3%	40%	0.6-1.4
Artichoke thistle																		
<i>Cynara cardunculus</i>				3	0	0										3	0	0
Black sage				8%												2%		
<i>Salvia mellifera</i>				1	1	3							2	1	3-4	3	2	6-7
				3%	100%								6%	50%	1.5-2.0	2%	67%	2.0-2.3
Coyote brush	1	0	0													2	1	4
<i>Baccharis pilularis</i>	5%									3%	100%	4.0				1%	50%	2.0

Plant Species	1996			1997			1998			1999			2000			1996-2000		
	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)	Number of nests	Successful Nests	Number of Fledglings (Per Nest)
Mulefat <i>Baccharis salicifolia</i>	1 5%	0	0				1 3%	1 100%	3-4 3.0-4.0				2 1%	1 50%	3-4 1.5-2.0			
Cudweed <i>Gnaphalium californicum</i>	1 5%	1 100%	4													1 100%	1 100%	4
Cudweed aster <i>Lessingia fasciculatum</i>				1 3%	1 100%	4										1 1%	1 100%	4
Coastal cholla <i>Opuntia prolifera</i>				1 3%	0	0										1 1%	0	0
Total	22 100%	7 32%	21-24 1.0-1.1	36 100%	14 39%	44-49 1.2-1.4	29 100%	13 45%	41-51 1.4-1.8	30 100%	15 50%	39-48 1.3-1.6	34 100%	12 35%	39-45 1.1-1.3	151 100%	61 41%	184-217 1.2-1.4

Table H: Habitat¹ Change in the Bonita Canyon Road Study Area, 1990-2000

Numbers indicate acres of each habitat type present.

Habitat Classification	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
scrub habitats, including ecotones 2.0 and 7.3	80	82	79	100	74	77	71	66	64	62	64
ruderal 4.6	10	23	21	42	30	33	29	35	44	38	26
annual grassland 4.1	298	241	243	204	157	155	154	33	25	5	8
riparian habitats 7.0, except 7.3	27	24	24	31	33	32	32	49	51	53	55
other habitats	1	1	1	1	1	1	1	1	2	1	1
agriculture 14.0	8	7	7	7	0	0	0	0	0	0	0
disturbed 16.0	39	84	82	69	171	148	107	207	84	62	66
paved roads 15.4	7	9	13	16	6	31	82	84	96	94	91
urban/ornamental plantings 15.1/15.5	9	9	9	9	8	4	4	3	114	166	168
Total	480	480	480	480	480	480	480	480	480	480	480

¹ Habitat classification follows Gray and Bramlet (1992)

Habitat Classification	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
coastal sage scrub restoration	0	1	1	3	7	12	27	29	34	34	34
wetland restoration	0	6	6	6	6	8	28	28	28	28	29

Table I: Habitats¹ Occupied by California Gnatcatchers, 1996-2000

Habitat Classification	1996	1997	1998	1999	2000	mean
sagebrush-buckwheat scrub 2.3.1	7.1	6.4	8.1	7.4	10.7	7.9
black sage scrub 2.3.4	0.8	1.0	1.0	0.9	1.1	1.0
sagebrush scrub 2.3.6	0	1.1	1.1	2.9	5.2	2.1
buckwheat scrub 2.3.7	0.7	0	0	0	0	0.1
coyote bush scrub 2.3.9	1.1	1.2	2.0	2.1	4.5	2.2
mixed sage scrub 2.3.10	7.2	2.2	1.9	1.8	5.2	3.7
deerweed scrub 2.3.13	0	1.3	1.4	1.2	1.7	1.1
southern cactus scrub 2.4	1.6	3.3	3.0	2.6	3.3	2.8
chenopod scrub 2.7	1.2	1.0	0.7	0.8	0.8	0.9
sage scrub-grassland ecotone 2.8	7.6	1.3	1.8	2.4	0.2	2.7
mulefat scrub 7.3	3.5	3.8	3.0	2.3	2.5	3.0
ruderal 4.6	2.8	3.1	1.2	3.6	1.9	2.5
annual grassland 4.1	13.9	0.7	0.4	0.3	0.2	3.1
riparian habitats 7.0, except 7.3	1.5	1.3	1.7	4.2	4.0	2.5
other habitats	0.2	0.2	0.1	0.2	0.4	0.2
disturbed 16.0	3.1	1.8	1.0	3.1	0.5	1.9
paved roads 15.4	0	0	0	1.1	1.0	0.4
urban/ornamental plantings 15.1/15.5	0	0	0.3	0.7	0.1	0.2
Total	52.3	29.7	28.6	37.4	43.0	38.2
coastal sage scrub restoration	3.0	6.3	7.3	9.9	17.0	8.7
wetland restoration	0.1	0.6	0.5	2.4	2.7	1.3

¹ Habitat classification follows Gray and Bramlet (1992)

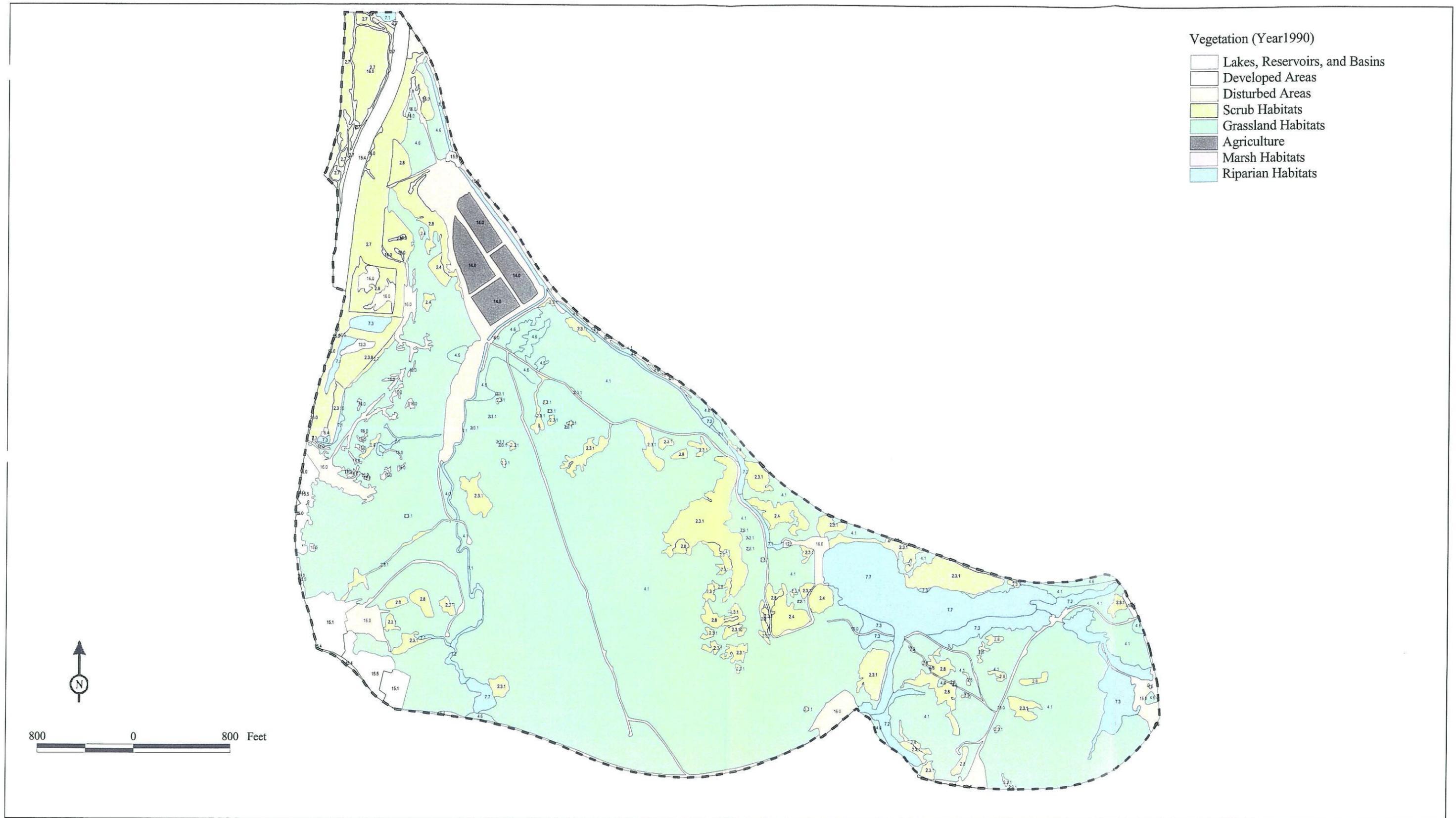
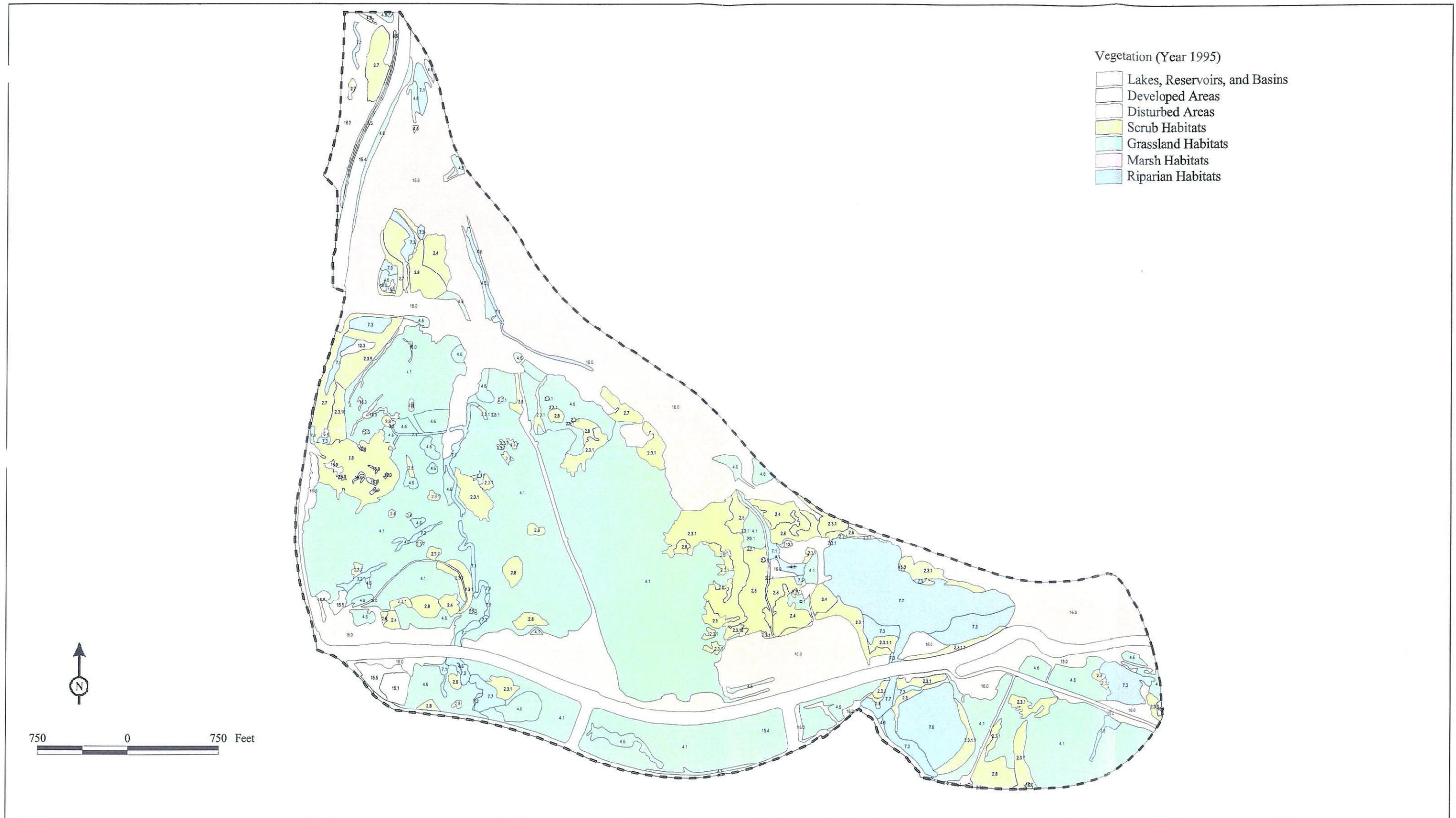


Figure 10

LSA

Bonitia Canyon Road
Study Area Vegetation for 1990



LSA

Figure 11

Bonitia Canyon Road Study Area Vegetation for 1995,
at the height of Construction for the San Joaquin Hills Transportation Corridor

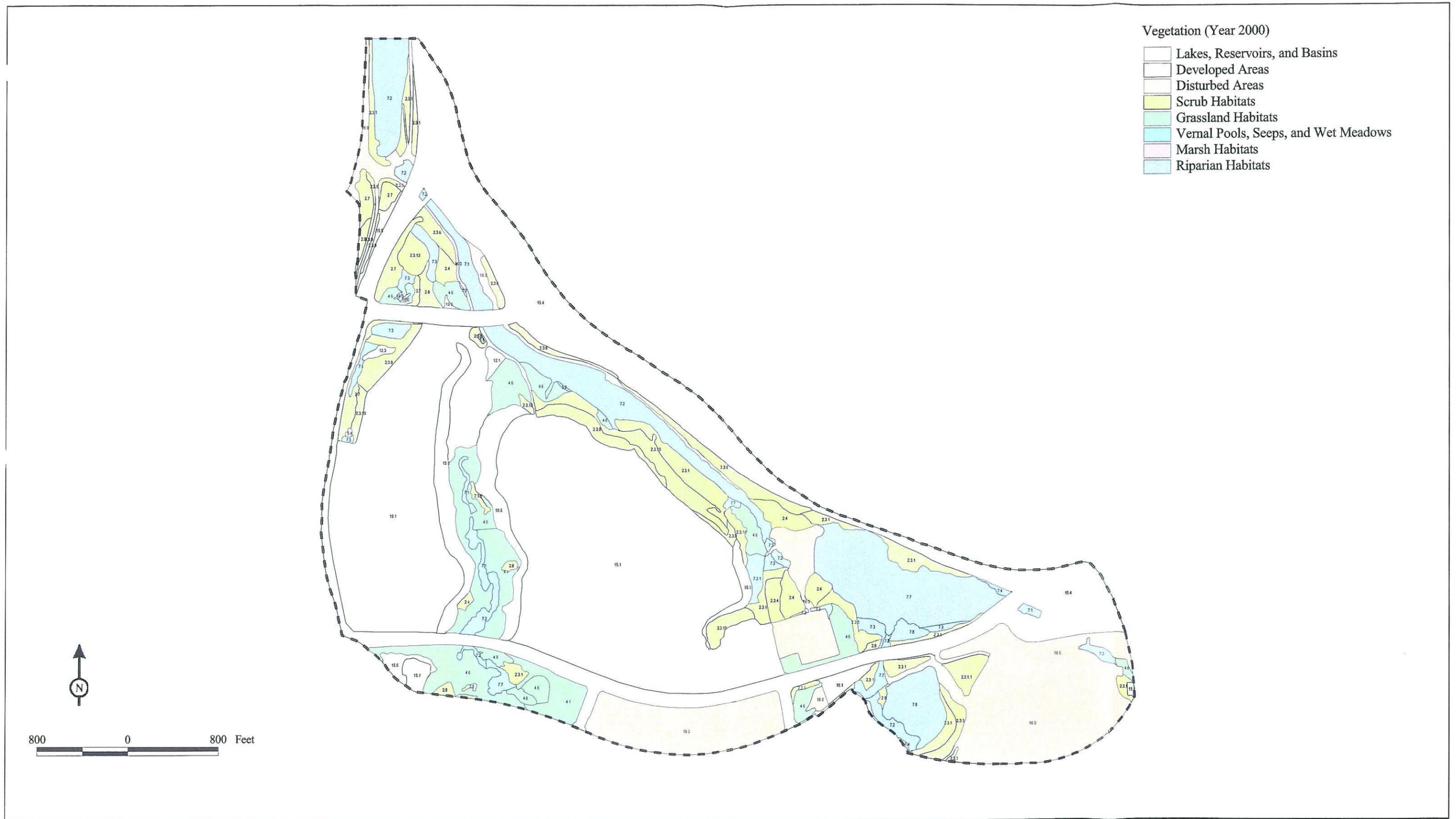


Figure 12

LSA

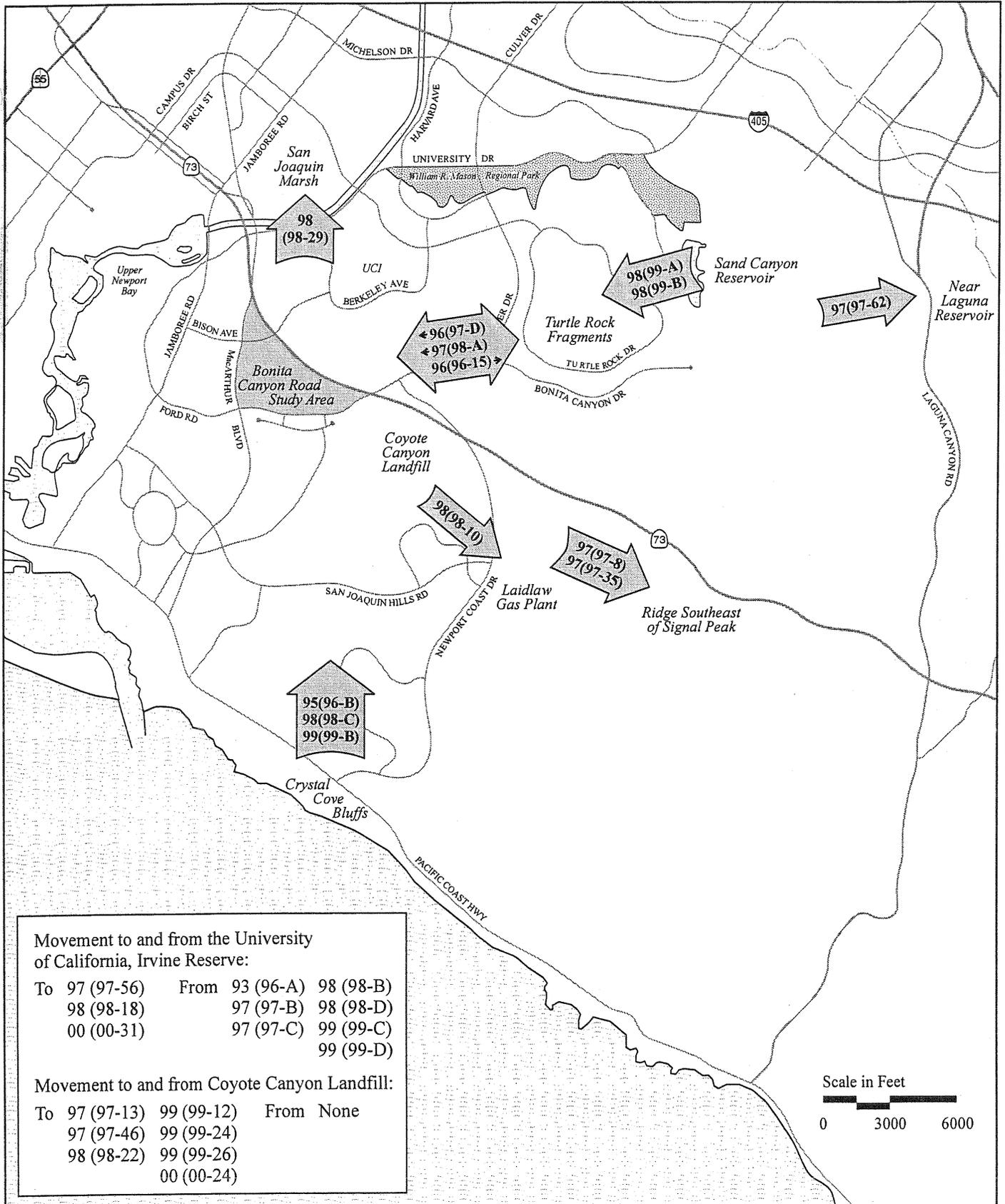
Bonitia Canyon Road
Study Area Vegetation for 2000



LSA

Figure 13

California Gnatcatcher (CAGN) Territories and Nest Locations, 2000



4/23/01(TCA504)

Figure 14

↑
N
LSA

Documented dispersal to and from the Bonita Canyon Road study area. For each bird documented, the year of birth is followed (in parentheses) by the individual's unique number for this study (cf. Appendix B). Additional dispersal documented included 1996-D (born in 1996; moved from Sand Canyon Reservoir to Upper Newport Bay-W side), 1999-G (born in 1998; moved from the UCI, Reserve to Upper Newport Bay-E side), and 1999-F (born in 1998; moved from the east side of Upper Newport Bay to the west side).

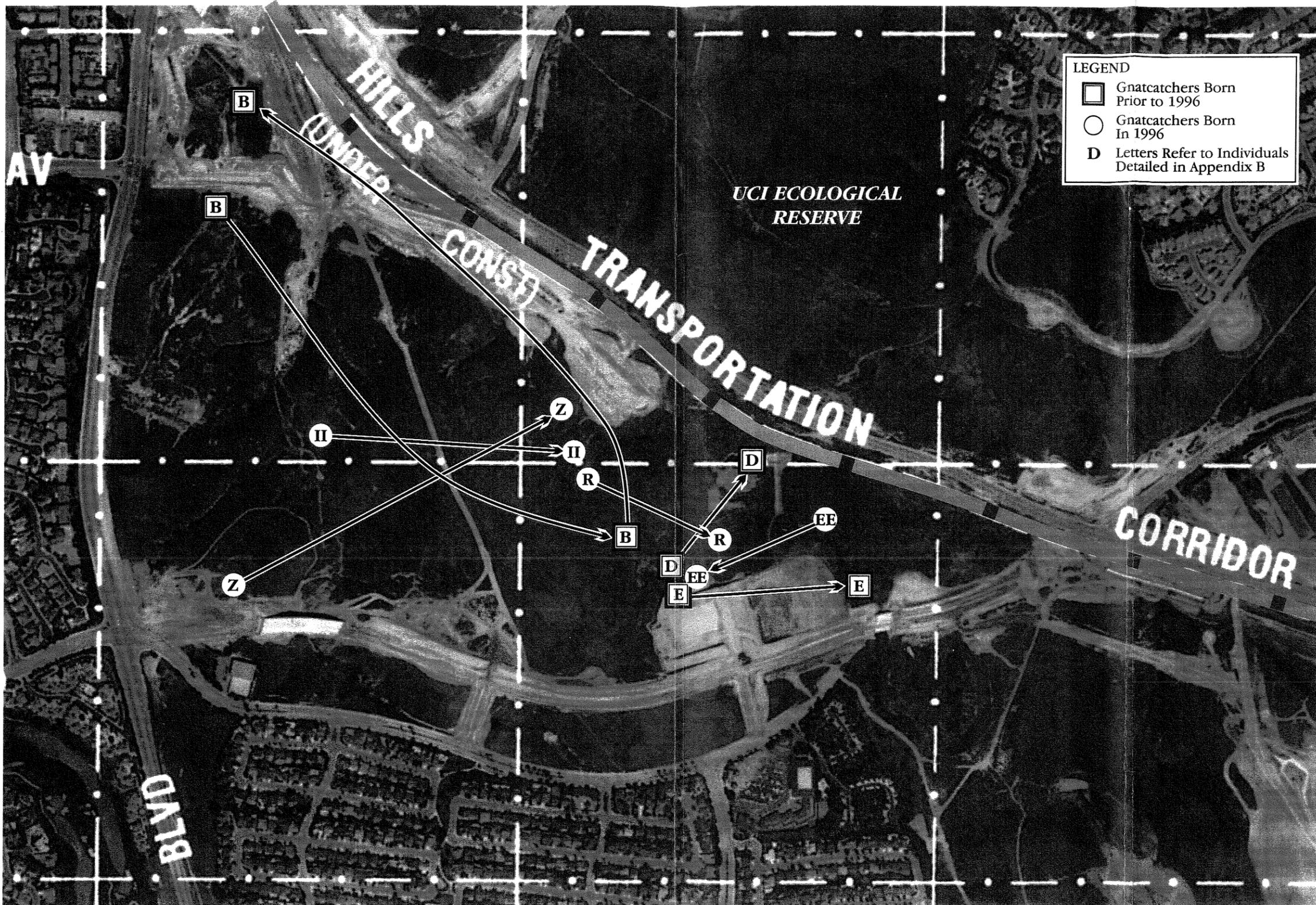
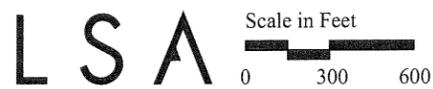


Photo Copyright 1996 by Aerial Fotobank, Inc.

4/23/01(TCA504)

Figure 15
Sheet 1



Local Movement of Banded
California Gnatcatchers in 1996

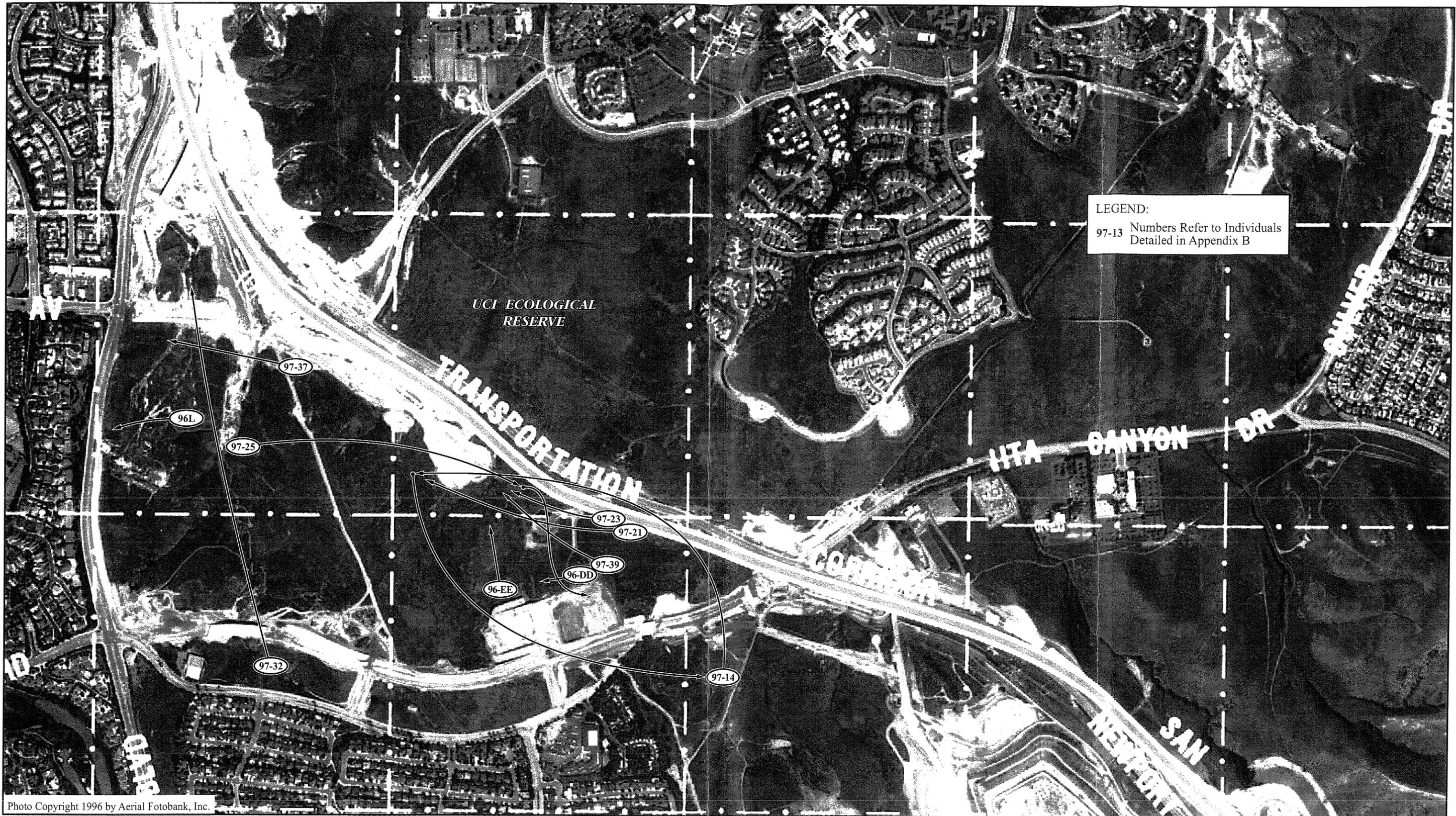
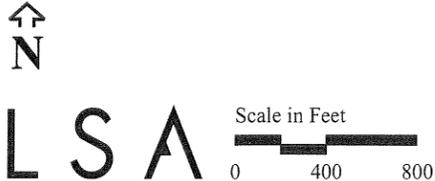


Figure 15
Sheet 2



Local Movement of Color-Banded California Gnatcatchers in 1997



4/23/01(TCA504)



LSA

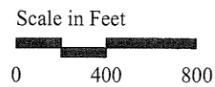


Figure 15
Sheet 3

Local Movement of Color-Banded
California Gnatcatchers in 1998



4/23/01(TCA504)



LSA

Scale in Feet



Figure 15
Sheet 4

Local Movement of Color-Banded
California Gnatcatchers in 1999



LEGEND:
 99-11 Numbers Refer to Individuals Detailed in Appendix B

4/23/01(TCA504)



LSA Scale in Feet
 0 400 800

Figure 15
 Sheet 5

Local Movement of Color-Banded California Gnatcatchers in 2000

during fall surveys of the bay (Figure 1). Complete details on the history of these and all other banded individuals is given in Appendix F.

DISCUSSION

Population Status and Reproductive Success

The number of gnatcatcher pairs present during the LSA study began at 24, dropped to 16 following extensive clearing in 1997, and rose again thereafter. In contrast to the finding of Atwood et al. (1999), the sharp population decline from 1994 to 1995 that was documented in numerous gnatcatcher populations in Los Angeles and Oranges counties (Atwood et al. 1998a,b; Erickson and Miner 1998) was the result of an unusually low population in the Bonita area in 1995, not an unusually high population in 1994. Indeed, the population was even higher in 1996.

Figure 9 and Table J show those areas of the study site used most by gnatcatchers from 1994-2000. Shaded cells in Table J indicate territories not available (dark shading; either because suitable vegetation had not grown in or suitable habitat was cleared for development) or significantly impacted by habitat clearing for development (light shading). Just three territories (BNCY18, BNCY6, and BNCY26) accounted for 24 percent of the fledglings produced during the same period (Table J). These three territories are the only ones immediately adjacent to the riparian vegetation of Bonita Reservoir, suggesting that some combination of increased food resources, cooler microclimate during heat stress, and lower predation rates afforded by this alternative habitat is responsible, as discussed by Campbell et al. (1998). Cowbirds are closely associated with riparian woodland, so the high gnatcatcher productivity of such sites might be reduced in the absence of cowbird trapping.

Eight territories (the aforementioned three plus BNCY15, BNCY17, BNCY23, BNCY2, and BNCY25) accounted for 50 percent of all fledglings produced from 1994-2000 (Table J). Four of these territories are in the vicinity of the reservoir, two were along MacArthur Boulevard (BNCY25 was razed in February 2001), and two were relatively isolated in between (most of BNCY17 was cleared in 1997) (Figure 9). In general, these territories represented core areas, with more peripheral areas used only in years of high abundance.

All else being equal, one might predict that reproductive success (per pair) would be highest in those years when available resources were shared by the fewest pairs. However, Table J shows that reproduction was just above average (cf. Table F) in 1995, when the population was lowest. The most productive year (combined and per pair) was in 2000 (Table F), when 18 pairs shared what was judged to be enough habitat for 22 pairs (Table J). Yet the second most productive year (again, both combined and per pair) was in 1999 (Table F), when 21 pairs occupied what was judged to be sufficient for only 20 "average" territories (Table J). Clearly, all else is not equal, and many factors combine to determine the success or failure of the population in any given year.

Territory size is also related to the number of pairs occupying the site. Table K shows territory sizes during the LSA study years. The average territory size was greatest in 2000, when the territory occupancy rate was lowest ($18/22 = 82$ percent; Table J); and except for 1997, when extensive clearing forced nine pairs to cling to portions of their previous territories, thus driving down the average territory size, the smallest average territory size was in 1999, when the occupancy rate was highest (1.05; Table J).

Table J: California Gnatcatcher Reproductive Output and Territory Availability and Occupancy, 1990-2000

Territory (*reveg. present)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	1994-2000
BNCY31 *								5+	2+			9.5
BNCY1 *				X	4	0	0	0	0	3-7	0	6.5
BNCY2 *				X	4	5	0	0	0	3	3-4	15.5
BNCY3 *				X	3	4	0	0				7
BNCY4 *				X	0		0		3	0	4	9
BNCY5 *					3	0	0	4	0	0		5
BNCY6 *				X	0	1+	4	7-8	4	6-7	3+	26
BNCY7 *					0		0	0				4
BNCY9				X	0		0	0	5-7	2	0	4
BNCY8				X	3		4					7
BNCY10					4		0					4
BNCY11 *				X	0		0	3		1-3	5-8	11.5
BNCY12				X	4		3	0				7
BNCY13					0			3-4	0	0	5-6	9
BNCY14				X	0		3+	0		3-4		6.5
BNCY15				X	4	4	0	0	5	4		19
BNCY16				X	0		0	3	2-4	3	4	11
BNCY17				X	4	4	3-4	4+				17
BNCY27							4	2+	2-3	0		7.5
BNCY18 *				X	4	3	6	4	3	2	3	27
BNCY19 *				X	0			0	3+	3	4	10
BNCY20				X	2+							2
BNCY21	considered equivalent to BNCY15 or BNCY25											
BNCY22				X	3							3
BNCY23 *				X			3	5-7	4			17
BNCY33 *										3-4	4	4
BNCY24				X			0					0
BNCY25				X	4	4	0	0	3-4	4	0	15.5
BNCY26 *							0	4	8	6+	3-4	21.5
BNCY28							1+					1
BNCY29							1+					1
BNCY30 *							2	4		0	2+	8
BNCY32 *										4-6		7
BNCY34 *										2+	4	4
BNCY35 *												0
BNCY36 *											2+	2
BNCY37 *											4	4
BNCY38 *											4	4
territories available	26	26	26	28	28	26	27	23	19	20	22	total fledged 317+
territories occupied	--	--	--	20	22	9	24	20	16	21	18	
fledglings/pair	--	--	--	--	2.1	2.8	1.6+	2.4- 2.8	2.4- 2.9	2.4- 3.1	3.0- 3.6	

Table K: California Gnatcatcher Territory Sizes in Acres, 1996-2000

Territory	1996	1997	1998	1999	2000	Mean±SD
BNCY1	1.73	1.42	1.78	3.11	3.04	2.22±0.80
BNCY2	1.86	2.15	3.98	2.00	2.65	2.53±0.86
BNCY3	1.39	0.78				1.09±0.43
BNCY4			1.66	1.19	2.30	1.72±0.56
BNCY5	1.88	1.84	0.81	1.92		1.61±0.54
BNCY6	0.89	0.95	0.94	1.59	1.93	1.26±0.47
BNCY7	1.20	0.85	1.44	0.61	4.38	1.70±1.53
BNCY8	1.75					1.75
BNCY9	1.59	1.10				1.35±0.35
BNCY10	1.42					1.42
BNCY11	2.24	1.08		1.23	2.01	1.64±0.57
BNCY12	11.05	0.95				6.00±7.14
BNCY13		1.36	1.36	1.62	2.08	1.61±0.34
BNCY14	1.40	1.36		1.20		1.32±0.11
BNCY15	2.04	1.91	2.47	2.18	3.83	2.49±0.78
BNCY16	2.21	2.25	2.01	2.23		2.18±0.11
BNCY17	1.49	0.37	0.79	2.52		1.29±0.94
BNCY18	1.86	1.79	2.73		1.61	2.00±0.50
BNCY18N				1.80		1.80
BNCY18S				0.72		0.72
BNCY19		0.79	0.79	1.21	1.12	0.98±0.22
BNCY23	0.92	0.64	1.01	2.67	2.71	1.59±1.01
BNCY24	2.19					2.19
BNCY25	3.37	3.37	4.34	3.71	3.84	3.73±0.40
BNCY26	1.02	1.47	1.32	1.59	1.02	1.28±0.26
BNCY27	1.18	0.31				0.75±0.62
BNCY28	3.02					3.02
BNCY29	2.99					2.99
BNCY30	1.37	1.68		1.97	3.49	2.13±0.94
BNCY31		1.45	1.18			1.32±0.19
BNCY32				1.65	1.29	1.47±0.25
BNCY34				0.87		0.87
BNCY36					2.75	2.75
BNCY37					1.61	1.61
BNCY38					1.56	1.56
Mean ± SD	2.19±1.99	1.36±0.70	1.80±1.09	1.79±0.78	2.40±1.00	1.89±1.28 0.31-11.05

The clearing and resulting artificial reduction in territory sizes makes it difficult to comment further on relationships such as those between habitat type and territory size. Note that territory sizes in the study area are among the smallest recorded for this species, as summarized by Preston et al. (1998).

At 44 percent, California sagebrush (the preferred nest substrate for gnatcatchers) proved to be just above the average of 41 percent nest success (Table G). Saltbush, goldenbush, and buckwheat nests fared about the same at 42, 50, and 40 percent, respectively; however, encelia nests were much less successful at 21 percent (n=19). Three nests in artichoke thistle were all unsuccessful, as is typical of nests in this plant (Atwood and Bontrager in press).

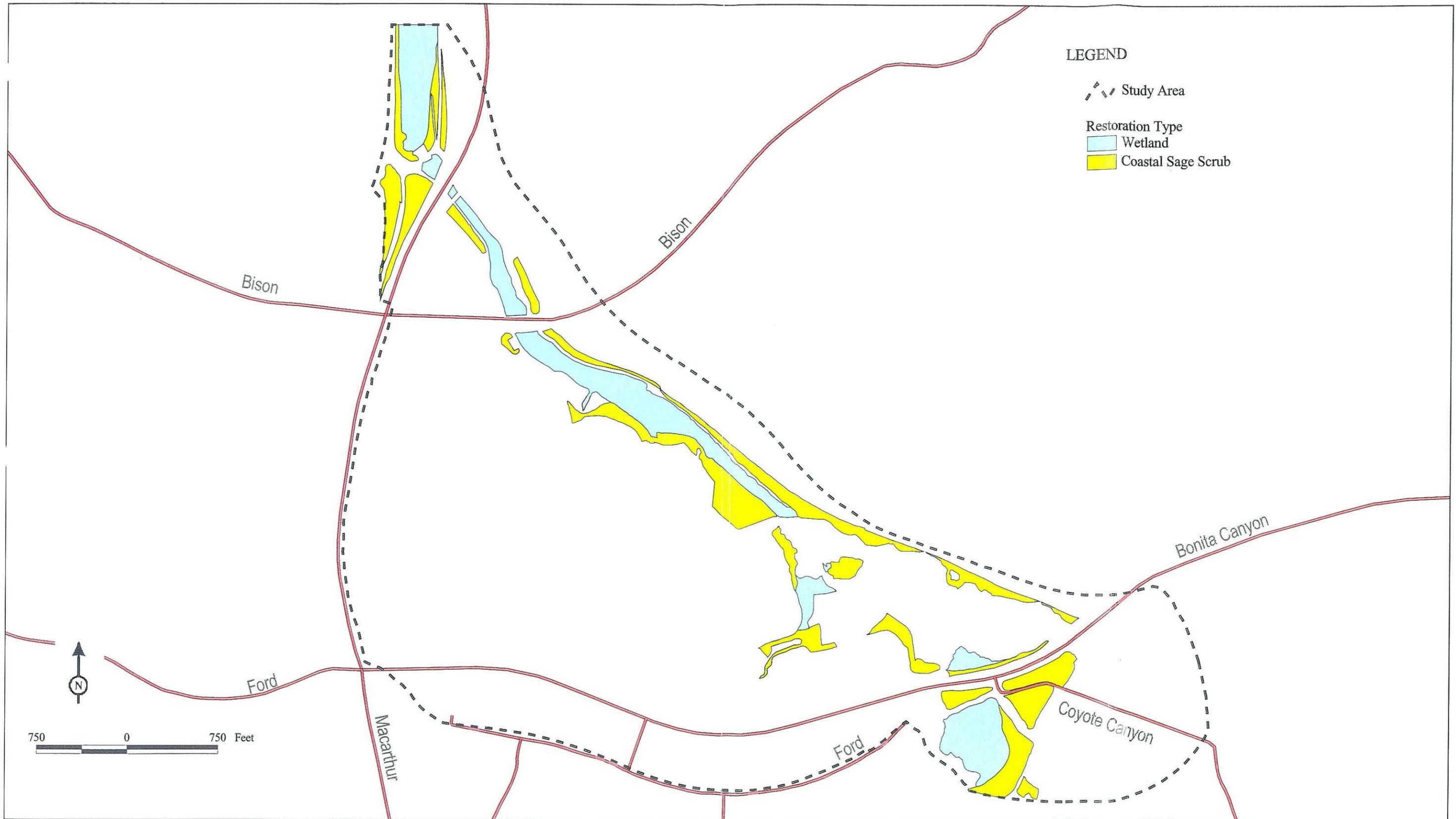
The overall nest success rate in this study (41 percent; Table G) is just below rates reported by Grishaver et al. (1998; 43 percent) and Galvin (1998; 46 percent). More at odds, the number of fledglings per pair in the study area has only once (2000, Table F) approached the average of 3.6 (range 2.3-5.7) reported by Bontrager et al. (1997, Table 8) for 16 study seasons from 1989-1996 at six sites throughout southwestern California. Still, the relatively successful 1999 season at the Bonita Canyon Road study area contrasted with results from six other studies in Orange County, where only the Coyote Canyon landfill was more productive (3.3 fledglings per pair) than the Bonita Canyon Road study area (Harmsworth 1999; D.R. Bontrager per. comm.). It is interesting to note that the mean clutch size change from 1999-2000 in this study (3.4 to 3.8; Table F) very closely matched the findings of Harmsworth (2001) at Coyote Canyon Landfill and along the SJHTC (3.4 to 3.9). Especially encouraging in 2000 was that when much of Orange and San Diego counties was reporting reductions in gnatcatcher pairs of 27-50+ percent (Harmsworth 2001), the Bonita Canyon Road area lost a mere 14 percent; note in particular the addition of two available territories thanks to restoration (Table J).

Noise Impacts

No evidence was obtained that noise impacted California gnatcatchers. Reproductive success as measured by fledglings per pair (Table F) was average in 1997, when grading of much of the western portion of the site made for especially noisy conditions; and the best was recorded in 2000, when clearing for the adjacent Newport Ridge development produced record high noise levels (see noise assessment, above). Territories closest to the SJHTC (e.g., BNCY6, BNCY19) were used by gnatcatchers to great advantage. Famolaro and Newman (1998) reported finding gnatcatchers in 46 of 57 patches of potential habitat along San Diego County highways.

Habitat Use

The peak of 100 acres of scrub habitat in 1993 (Table H) was the result of ecotone vegetation replacing annual grassland after the removal of cattle in 1991-1992. Subsequent losses were due to grading activities, offset somewhat by restoration efforts (see below). Similarly, the amount of habitat occupied by gnatcatchers was lowest in 1997 and 1998, following grading, and rebounded in 1999 and 2000 as revegetated areas achieved sufficient maturity to serve as gnatcatcher habitat. The significant use of riparian and ruderal habitats found here (Table I) was discussed previously by Campbell et al. (1998). The relatively large amount of annual grassland within territories, shown in Table I, is skewed by the exceptionally large size of BNCY12 in 1996.



LSA

Figure 16

Existing Coastal Sage Scrub and Wetland Restoration Areas in the Bonitia Canyon Road Study Area

Revegetation Efforts

As noted already, revegetation efforts in the study area offset scrub habitat lost to development (Table H, Figure 16). By the end of the study period, more than half of all scrub present was due to restoration (the majority of it put in place by the TCA), although less than one-quarter of occupied scrub could be so claimed (Table I). Territories BNCY31-38 are composed entirely of revegetation areas, and 12 additional territories include some restoration (Table J). As these and additional sites mature, more gnatcatchers are expected to exploit them. The apparent correlation between productive territories and riparian vegetation nearby (suggested in the first paragraph of the Discussion section) bodes well for the minimum of seven territories lined up along the restoration areas on Bonita Creek below the reservoir. Riparian restoration efforts by the TCA there have provided increasingly rich habitat that may benefit gnatcatchers on the adjacent slopes.

Movement Patterns

As recently as the early 1990s, there was doubt (at least among some people) that California gnatcatchers could cross roads such as the SJHTC. Studies such as this have provided a definitive answer. Moreover, this and similar studies (e.g., Bailey and Mock 1998) have shown that gnatcatchers are capable of crossing limited amounts of unsuitable habitat to reach islands of habitat beyond. Within the vicinity of Bonita Reservoir during the time of this study, gnatcatchers were known to move between such areas as the San Joaquin Hills, Crystal Cove State Park (bluffs), scrub fragments in the Turtle Rock area of Irvine, the UCI Reserve, San Joaquin Marsh, Upper Newport Bay, the scrub fragment at Fashion Island, and even beyond to scrub habitat at the mouth of the Santa Ana River. With planning and effort, archipelagos of habitat such as this can be maintained that will allow gnatcatchers to coexist literally side by side with people. Core areas of habitat of sufficient size (such as the San Joaquin Hills Reserve) must be preserved to see gnatcatchers and other species through difficult periods such as extended droughts. But during more normal and favorable years, smaller sites such as the Bonita Canyon Road area will prove to be of considerable value in the effort to maintain healthy California gnatcatcher populations in Orange County.

CONCLUSION

This study was successful in documenting at least four things:

- 1) The SJHTC does not serve as an effective barrier to dispersing juvenile gnatcatchers.
- 2) Gnatcatchers can live and reproduce successfully in close proximity to both Bonita Canyon Road and the SJHTC.
- 3) Coastal sage scrub restoration efforts undertaken primarily by the TCA have allowed the gnatcatcher population in the Bonita Canyon Road area to remain relatively stable over the last ten years, in spite of large scale habitat changes in the immediate vicinity.
- 4) With sufficient effort and planning, other areas probably can maintain populations of sensitive species in and around ongoing human development.

LEAST BELL'S VIREOS

METHODS

Least Bell's vireo surveys were conducted by LSA annually from 1997 through 2000. Chambers Group biologists provided partial information for 1996. A complete accounting of observations is included in Appendix G. Figure 17 shows least Bell's vireo locations at Bonita Reservoir in 1997, 1998, and 2000. As summarized below, vireos did not nest successfully at the reservoir from 1996-1999, but a single pair fledged three young in 2000.

RESULTS

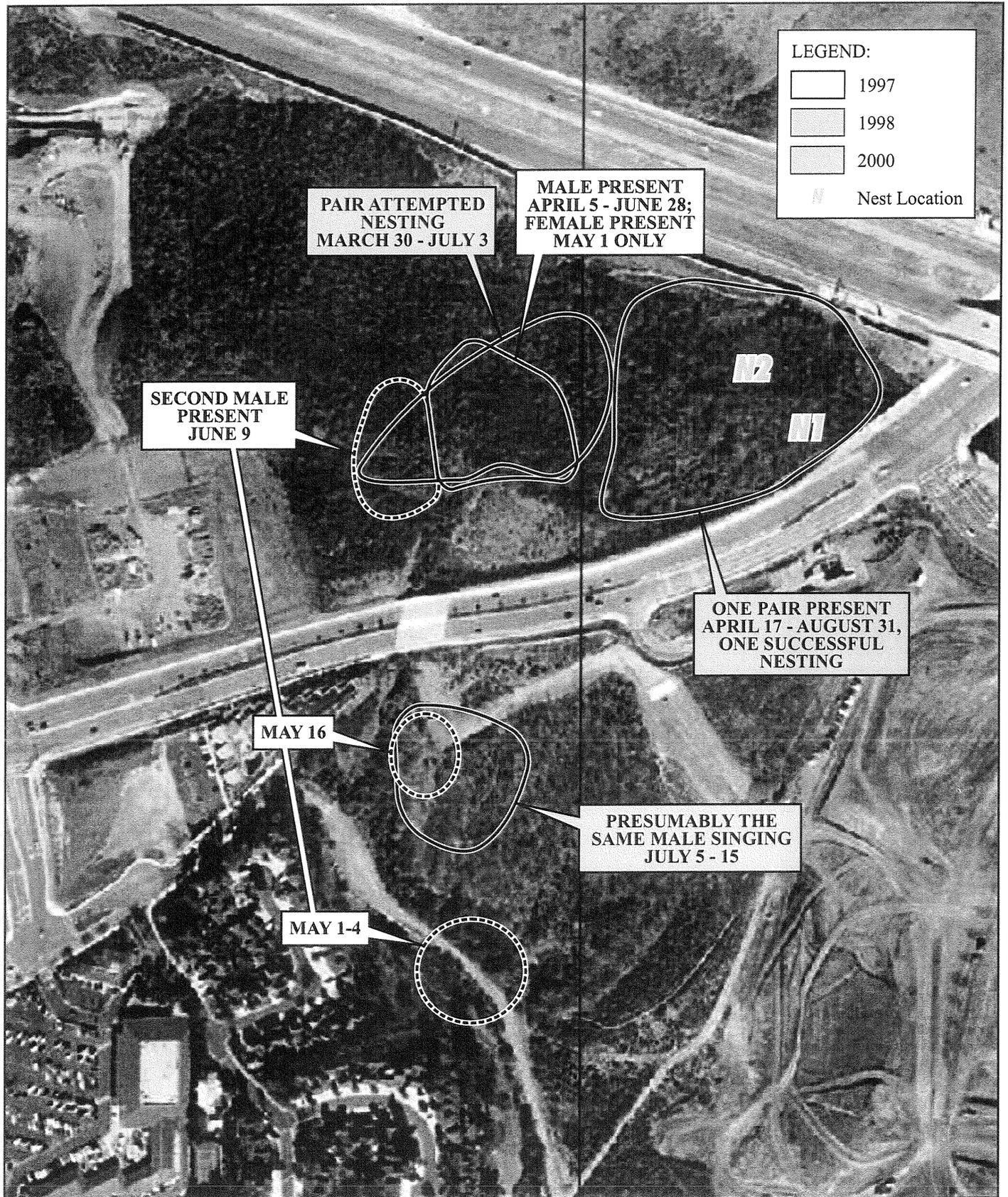
During the period of April 5 to July 3, 1996, Chambers Group biologists observed up to three males, one of which was observed nest building, but no females were seen. This was the first time since 1990 that no nesting pairs of vireos were found at the reservoir.

In 1997, least Bell's vireos failed for the second consecutive year to nest successfully at Bonita Reservoir. The same male was present continuously from April 5 to June 28. A female was observed with him on only one occasion. A second singing male was observed from May 1 to June 9, first along the creek adjacent to the Pelican Hill wetland mitigation site and later in the reservoir itself; presumably only one bird was involved.

Least Bell's vireos also failed to nest successfully in 1998. A pair was present in the reservoir from at least March 30 to June 24. Two nests were located, the latter containing four eggs; however, no young were ever seen. Presumably the male of this pair moved upstream, across Bonita Canyon Road, where he was heard singing along the creek and in the Pelican Hill Road wetland mitigation site July 5 and 15.

There was only a single least Bell's vireo observation in 1999. This was also the fourth consecutive year that vireos failed to nest successfully at Bonita Reservoir. A singing male was heard adjacent to BNCY6 on July 15 only.

One pair of least Bell's vireos nested successfully in the final year of the study, 2000. A male was observed singing near BNCY6 from April 17 to April 28. A pair was observed tending a nest in the reservoir from at least May 7 to June 4. Three young were first observed in the nest on May 21. On June 4, the pair was observed feeding the fledglings. On June 7, the nest was seen on the ground, with no birds observed. However, on June 13, the pair was observed tending the three fledglings. The male was observed building a second nest on June 23, and three eggs were located in the nest on July 17. On August 1, the failed nest was observed covered with ants, and no adults were found. A single male was singing near BNCY26 on August 31.



4/23/01(TCA504)

Figure 17



LSA

Scale in Feet
0 150 300

Least Bell's Vireo Observations
at Bonita Reservoir 1997-2000

DISCUSSION

During the entire study period, there was no evidence of noise disturbance on this species. In 2000, the first nest was located close to Bonita Canyon Road and, despite high noise levels from adjacent road work and large-scale earthmoving operations, was successful in fledging young.

Reasons for the decline of vireo activity in the study area are unclear; however, plant succession in the reservoir itself offers the most likely explanation. The amount of early successional riparian vegetation generally preferred by this species has declined in recent years, and vireo territories have gradually moved east, away from the most densely forested portions of the reservoir. However, wetland restoration areas along Bonita Creek downstream from the reservoir seem poised to soon offer habitat for this species.

CONCLUSION

Noise from the SJHTC appears to have had no negative effect on nesting least Bell's vireos during the study period. The TCA's wetland mitigation in the Bonita Creek channel will likely provide new habitat to counteract the loss of habitat due to plant succession in Bonita Reservoir.

PERSONNEL

Noise assessment was conducted by LSA noise specialists Dr. Tony Chung (1998-2000), Dr. Sam Lane (1996-1997), and Mike Greene (1996). The wildlife movement study was conducted by LSA biologists John Ko (1997-2000) and Jeff Bray (1996). LSA biologist Richard Erickson monitored California gnatcatchers and least Bell's vireos, with banding activities and much of the gnatcatcher monitoring conducted by subconsultant David Bontrager. Chambers Group biologists (Mari Schroeder, Brian Leatherman, and others) monitored all gnatcatchers in 1994 and 1995 and a portion of the population in 1996. The GIS effort was conducted by LSA employees Zac Henderson, John Ko, Jayna Goodman, and Blake Selna. LSA Principal Art Homrighausen served as Project Manager and Principal in Charge.

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APPENDIX A

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 1996

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON STUDY AREA, 1996¹

		Observer(s)
BNCY1	[habitat ² 2.2.3.1/7.3]	
2.18	pair below church (BNCY26)	RAE
3.9	male in mulefat	JBray
3.22	pair	Chambers
3.25	male (presumably) across Ford Rd. in BNCY26	RAE
3.27	male in mulefat/css/willows	RAE
4.13	male (big sweep through territory, inc. both sides of creek and Ford Rd.)	RAE
4.26	[male? - moving widely in the area between 1 and 14; female? - joined male at BNCY26]	RAE
May-July	territory abandoned	RAE
BNCY2	[habitat 2.4/2.8/2.3.1]	
2.18	pair present	RAE
3.25	unbanded pair, female N ¹ B	RAE
4.13	unbanded pair present	RAE
4.28	unbanded male present; status?	RAE
5.5	unbanded pair at N ² /3EE in sagebrush	RAE
5.13	unbanded pair at N ² /2YY1E in sagebrush	RAE,DRB
5.16	N ² found failed	DRB
5.21	unbanded pair present; male chased from BNCY18	RAE
5.27	unbanded pair present; status?	DRB
6.9	unbanded male drives off BNCY4?	RAE
7.1	unbanded pair foraging; no action	RAE
7.4	unbanded male present; also one juvenile from BNCY18 (MLP-DB; 1996-28)	RAE
7.11	juvenile from BNCY8 (Y/LGM-P; 1996-16) moving widely	DRB
BNCY3	[habitat 2.3.1]	
2.18	pair (female = DGM-Y, 1996-A; banded at UCI in 1993) completing N ¹ in sagebrush (record early nest building in Orange County - Bontrager et al. 1996)	RAE
3.25	pair N ² B (new); female = DGM-Y	RAE
4.13	pair present (female = DGM-Y)	RAE
4.28	pair present (female = DGM-Y), N/YY??	RAE
5.5	pair present (female = DGM-Y), N/EE??	RAE
5.13	banded female (DGM-Y) seen (brief visit)	RAE,DRB
5.21	pair present (female = DGM-Y), status?; male chased off by BNCY10	RAE
5.23	male N ³ B in sagebrush (platform only)	RAE
6.3	pair present (female = DGM-Y); no apparent interest in N ³ site	RAE
6.9	pair present (female = DGM-Y); male finishing new N ⁴ in <i>Enselia</i>	RAE
7.4	female (DGM-Y) on N ⁴ /3EE in <i>Enselia</i>	RAE
7.5	N ⁴ /3EE in <i>Enselia</i>	RAE
7.11	N ⁴ /3EE predated/abandoned (2EE intact, 1 with puncture); unbanded juvenile present	DRB
BNCY4?	[habitat 2.4/2.3.1]	
3.29	pair	Chambers
5.23	apparent undetected pair (female probably = RM-O)	DRB,RAE
6.3	uncooperative male in area	RAE
6.9	unbanded male with 1-2 unbanded juveniles below dam	RAE
BNCY5	[habitat 2.8/2.4]	
2.18	male only seen	RAE

¹ Band colors: B, black; DB, dark blue; DG, dark green; LB, light blue; LG, light green; LP, light pink; M, metal (USFWS); O, orange; P, purple; R, red; W, white; Y, yellow; R/W, red over white split-color band, etc.

² Habitat designations follow Gray and Bramlet (1992): 2.3.6 (Sagebrush Scrub), 2.3.7 (Buckwheat Scrub), 2.3.10 (Mixed Sage Scrub), 2.3.12 (Sagebrush-Coyote Bush Sage Scrub), 2.7 (Chenopod Scrub), 2.8.1 (Sagebrush-Grassland), 2.8.2 (Buckwheat-Grassland), 2.8.5 (Mixed Sage Scrub-Grassland), 4.1 (Annual Grassland), 4.6 (Ruderal), 7.3 (Mulefat Scrub)

3.8	pair present	Chambers
3.15	pair finishing N ¹ construction (large territory)	Chambers
3.22	N ² B (new)	Chambers
3.25	male h.o.	RAE
3.29	N ² built	Chambers
4.1	N ³ B (new)	Chambers
4.8	N ⁴ B (new)	Chambers
4.12	N ⁵ B (another new)	Chambers
4.19	NB?	Chambers
5.7	N/(EE?)	Chambers
5.10	N/(EE?)	Chambers
5.23	unbanded pair foraging	DRB,RAE
5.27	female present	DRB
6.9	unbanded pair N ⁶ B in sagebrush; cup nearly completed	RAE
6.11	unbanded pair at N ⁶ in sagebrush	Chambers
6.last week	two banded birds seen	Chambers
BNCY6	[habitat 2.3.1, some of it revegetated]	
3.8?	pair present	Chambers
3.15	pair N ¹ B	Chambers
3.22	pair present	Chambers
3.29	present	Chambers
4.1	pair present	Chambers
4.12	N?	Chambers
4.19	N ¹ /YY	Chambers
4.26	pair with four fledglings	Chambers
5.10	pair with four fledglings	Chambers
5.14	pair with four fledglings	Chambers
6.7	pair on new N ² /YY	Chambers
6.19	pair tending N ² /4YY	Chambers
7.14	not found	DRB
BNCY7	[habitat 2.3.1]	
3.8	N ¹ near completion in sagebrush below a big cactus patch	Chambers
3.25	unbanded pair N ² B in sagebrush (at bottom of slope); cup nearly done	RAE
4.13	unbanded pair casually foraging	RAE
4.28	unbanded pair present, N/EE?	RAE
5.21	unbanded male chased out of BNCY9	RAE
5.23	unbanded pair foraging together	RAE
6.3	unbanded pair foraging together	RAE
6.9	unbanded pair foraging casually together; border dispute with BNCY9	RAE
7.4	pair present; no action	RAE
7.5	pair present; border dispute with BNCY9; no action	RAE
BNCY8	[habitat 2.3.1]	
2.18	single male (incomplete check)	RAE
3.8	single male	Chambers
3.25	unbanded male	RAE
4.13	unbanded pair at N ¹ /4YY (mid-sized) in sagebrush	RAE
4.28	unbanded pair tending fledglings	RAE
5.13	unbanded pair tending four fledglings	RAE,DRB
5.16	pair & 3 fledglings (male & YY banded) (male = R/WM-DB, 1996-14; Y = Y/LGM-LG, 1996-15; Y = Y/LGM-P, 1996-16; Y = R/WM-O, 1996-17)	DRB
6.3	pair (male = R/WM-DB) only; young apparently dispersed	RAE
7.4	male drives off male BNCY9	RAE
7.5	heard only	RAE
7.11	banded juvenile (Y/LGM-P) observed at BNCY2	DRB
7.15	banded juvenile (Y/LGM-LG) netted at Turtle Rock (loc. 7)	DRB
7.29	three juveniles present, one banded (DBR/W-M, 1996-33; from 17) flew in from BNCY23	RAE

BNCY9	[habitat 2.3.1]	
2.18	pair present	RAE
2.27	male banded: DBO-M, 1996-1	DRB
3.25	pair present (male = DBO-M)	RAE
4.13	pair present (male = DBO-M)	RAE
4.28	pair present (male = DBO-M), no action?	RAE
5.13	male (DBO-M) chasing two other males (brief visit)	RAE,DRB
5.21	pair present (male = DBO-M), near N?	RAE
5.23	pair present (male = DBO-M), near N?	RAE
6.3	pair present (male = DBO-M), no action	RAE
6.9	pair present (male = DBO-M), no action; border dispute with BNCY7	RAE
7.4	pair present (male = DBO-M), no action; 2 juveniles present, one banded (combo?)	RAE
7.5	pair present (male = DBO-M), no action; unbanded juvenile also present	RAE
BNCY10	[habitat 2.3.1/2.8]	
4.28	pair present, but not earlier; status? (female = DBW-M, 1996-B; banded at Crystal Cove and formerly at BNCY15)	RAE
5.5	pair present (female = DBW-M); status?	RAE
5.13	male present (brief visit)	RAE,DRB
5.21	pair present (female = DBW-M); copulating; near N?	RAE
5.23	pair present (female = DBW-M); near N?	RAE
6.3	not found	RAE
6.9	not found	RAE
7.1	no action; female (DBW-M) moves from BNCY3 to BNCY11 where squabbles with female BNCY11; unbanded male moving widely; banded juvenile (MO-LP; 1996-29) from BNCY18 also present at BNCY10/11	RAE
7.4	unbanded male very chummy with 2 unbanded juveniles, but apparently not his own	RAE
7.5	unbanded male present; 2 unbanded juveniles also present	RAE
7.11	pair (female = DBW-M) observed at BNCY3	DRB
BNCY11	[habitat 2.3.10(<i>Artemisia/Toxocodendron/Mimulus/Eriogonum</i>)]	
2.18	pair present	RAE
2.27	banded two males, LBP-M, 1996-2 and MW-Y, 1996-3 (later moved to BNCY26)	DRB
3.25	pair present (male = LBP-M)	RAE
4.13	pair (male = LBP-M) N ¹ B (cup) in <i>Encelia</i>	RAE
4.28	male (male = LBP-M) on N ¹ /4EE in <i>Encelia</i>	RAE
5.5	pair (male = LBP-M) at N ¹ /3Y1E in <i>Encelia</i>	RAE
5.13	pair (male = LBP-M) at N ¹ /3Y1E in <i>Encelia</i> ; YY banded (Y/LGM-R, 1996-11; R/WM-Y, 1996-12; R/WM-DG, 1996-13 = biggest)	RAE,DRB
5.21	pair present (male = LBP-M); no sign of young	RAE
6.9	male (LBP-M) present; female on N ² /3EE in sagebrush among mustard	RAE
7.1	sagebrush N ² now empty (failed?); female squabbles with female BNCY10; juvenile (MO-LP, 1996-29) from BNCY18 also present	RAE
7.4	female only present	RAE
7.5	not found	RAE
7.11	unbanded pair present; juvenile (MO-LP) from BNCY18 still present, with an unbanded juvenile	DRB
7.14	not found	DRB
7.29	unbanded female present	RAE
BNCY12	[habitat 2.4/2.8/4.6]	
2.16	pair present	RAE
2.29	male banded: R-MP, 1996-6; now lost	DRB
4.14	unbanded male (female possibly on N/EE in buckwheat patch	RAE
4.25	1) unbanded pair near Ford x MacArthur; 2) nothing at buckwheat patch; 3) unbanded male chased from BNCY28 to lower BNCY12 drainage; 4) unbanded male followed from lower BNCY12 drainage back to Ford x MacArthur	RAE
5.13	unbanded pair at N ¹ /YY (large)	RAE,DRB
5.23	pair with 3 fledglings - 4/5 banded (male = DGM-Y/LG, 1996-22; female = WM-R/W, 1996-23; Y = MR/W-B, 1996-24;	DRB

	Y = M-RY/LG, 1996-25)	
	7.5 unbanded non-adult-male present, plus one other bird unseen	RAE
	7.29 unbanded female with banded male (presumably DGM-Y/LG); banded juv. (MR/W-B) at BNCY23	RAE
BNCY13	[unused]	
BNCY14	[habitat 7.3/2.3.1]	
	2.18 unbanded pair foraging in mulefat	RAE
	3.1 unbanded pair foraging in mulefat	RAE
	3.25 unbanded pair foraging in mulefat (NW corner)	RAE
	4.25 unbanded male foraging in mulefat	RAE
	4.26 unbanded pair at N ¹ /3YY (3-4 days old??) 1.5 m up in dense mulefat	RAE
	5.10 unbanded pair foraging (young??)	RAE
	5.23 unbanded female foraging alone; N ¹ apparently failed	DRB,RAE
	6.4 unbanded pair tending three small fledglings	RAE
	7.29 unbanded female moving widely with unbanded juvenile suggests successful second nesting	RAE
BNCY15	[habitat 2.3.9/2.7/7.3]	
	2.16 pair (female = DBW-M, 1996-B, banded as nestling at Crystal Cove in 1995; moved to BNCY10)	
	2.29 male banded: PM-W, 1996-7	RAE
	3.8 "two pairs" present (inc. banded bird)	DRB
	4.14 unbanded pair (apparently N ¹ /EE in coyote bush)	Chambers
	4.25 unbanded pair tending N ¹ /4YY (4-5 days old??) in coyote bush	RAE
	5.24 male present; also lone juvenile (from BNCY25?)	RAE
	5.26 male banded: RM-B, 1996-26; no sign of fledglings, N ¹ apparently failed	RAE
	7.3 birds present at BNCY15/16 - situation unclear	DRB
	7.5 birds present at BNCY15/16 - situation unclear	RAE
BNCY16	[habitat 2.3.10/2.3.9/2.7]	
	2.16 male (plus female?) in sagebush	RAE
	4.14 unbanded male in sagebush	RAE
	4.25 unbanded pair in sagebush (possibly N/EE)	RAE
	5.26 N ¹ /4EE along fence in saltbush	DRB
	7.3 birds present at BNCY15/16 - situation unclear	RAE
	7.5 birds present at BNCY15/16 - situation unclear	RAE
BNCY17	[habitat 2.3.6]	
	2.16 pair present	RAE
	2.29 female banded: LBY-M, 1996-8	DRB
	4.14 unbanded male present	RAE
	4.25 pair (female = LBY-M) NB?	RAE
	4.28 male in border dispute with BNCY27	RAE
	5.13 pair (female = LBY-M) at N ¹ /3YY1E in sagebrush	RAE,DRB
	5.20 N ¹ found failed	DRB
	6.8 male at N ² /4YY (small) in sagebrush	RAE
	7.3 pair (female = LBY-M) tending 3+ juveniles	RAE
	7.13 pair (female = LBY-M) tending 3+ juveniles across the creek; recaptured female and banded male (YLP-M, 1996-31) and two juveniles (OY/LG-M, 1996-32 & DBR/W-M, 1996-33); other birds about (see DRB notes)	DRB
	7.29 banded juvenile (DBR/W-M) at BNCY23/8	RAE
BNCY18	[habitat 2.4/2.3.1]	
	2.18 male only	RAE
	2.27 banded two birds; female LGM-W, 1996-4, male DBM-R, 1996-5	DRB
	3.8 single male	Chambers
	3.22 vocal male down to the reveg area and back	Chambers
	3.25 pair (female = LGM-W) present	RAE
	4.28 male present; status?	RAE
	5.5 pair (female = LGM-W) at N ¹ /large YY (one flushed from nest) in sagebrush	RAE
	5.20 pair (female = LGM-W) tending 3 fledglings	DRB
	5.21 pair (female = LGM-W) tending 3 noisy fledglings	RAE,JNK
	5.23 pair (female = LGM-W) tending 3 noisy fledglings	DRB,RAE

5.27	rest of family banded: male = YM-LP, 1996-27; Y = MLP-DB, 1996-28; MO-LP, 1996-29; MY/LG-LP, 1996-30	DRB
7.1	banded pair (male = YM-LP, female = LGM-W) at new N ² /3YY (moderate size) in goldenbush on reveg. slope; banded juvenile (MO-LP) moved to BNCY10/11 (7.1-7.11)	RAE
7.4	banded pair (male = YM-LP, female = LGM-W) at N ² /3YY (large) in goldenbush	RAE
7.5	banded pair (male YM-LP, female LGM-W) at N ² /3YY (large); unbanded juvenile also present	RAE
7.11	young had fledged	DRB
7.14	netted the entire family, parents already banded (male = YM-LP, female = LGM-W), young = BR-M, 1996-34, Y/LGLG-M, 1996-35, & W-BM, 1996-36	DRB
7.29	banded family group (only the male's YM-LP actually read) in ruderal vegetation across the fence on the church site; male moved back across reveg. site to vicinity of N ²	RAE
BNCY19	[not used]	
BNCY20	[habitat eliminated by New Ford Road construction; not used since 1994; habitat was 7.3/2.8]	
BNCY21	[perhaps never a territory; family groups seen in 1994 & 1995 may have come from elsewhere (e.g., BNCY25); habitat was 2.7/2.3.9]	
BNCY22	[habitat eliminated by SJHTC construction; not used since 1994; habitat was 2.7]	
BNCY23	[habitat 2.3.1]	
3.8	present	Chambers
3.15	pair starting N ¹ B	Chambers
3.21	N ² B (new)	Chambers
3.29	present	Chambers
4.12	N ² /EE	Chambers
4.19	N ² /YY	Chambers
4.23	N ² /4YY	Chambers
4.28	pair with food	RAE
5.3	pair with three fledglings	RAE
5.10	pair with three fledglings	RAE
5.13	present	DRB,RAE
5.27	pair present	DRB
6.last week	on new N ³	Chambers
7.29	three juveniles present, two banded: MR/W-B, 1996-24 (from BNCY12) flew NW, DBR/W-M, 1996-33 (from BNCY17) flew to BNCY8	RAE
BNCY24	[habitat 2.3.1/4.6]	
3.8	present	Chambers
3.15	pair?	Chambers
3.21	pair bonding	Chambers
3.29	on N ¹ /EE	Chambers
4.5	N ¹ now blown down	Chambers
4.9	N ² B (new)	Chambers
4.19	N ² /EE	Chambers
4.28	male present	RAE
5.10	N ³ B	Chambers
5.13	present	DRB,RAE
5.14	pair on N ³	Chambers
5.27	pair present near N ³ ?	DRB
6.7	pair at N ³ /YY well up the drainage	Chambers
6.19	pair tending N ³ /YY	Chambers
6.last week	N ³ failed	Chambers
7.29	unbanded male and two unbanded juveniles present	RAE
BNCY25	[habitat 2.7/7.3]	
3.8	present	Chambers
3.15	pair?	Chambers
3.21	present	Chambers
3.29	present	Chambers
4.1	present	Chambers
4.12	pair feeding at N ¹ /YY in sagebush	Chambers
4.14	pair feeding at N ¹ /YY in sagebush	RAE

4.19	pair with three fledglings	Chambers
5.24	male and one juvenile seen	RAE
5.26	two juveniles	DRB
5.30	N ² /EE in saltbush	Chambers
6.6	N ² failed	Chambers
6.last week	no action	Chambers
BNCY26	[habitat 2.3.1/7.3]	
3.25	male (MW-Y, 1996-3) now here	RAE
3.27	male (MW-Y) present	RAE
4.1	male (MW-Y) present	RAE
4.13	male (MW-Y) agitated, apparently following appearance of male BNCY1	RAE
4.26	male (MW-Y), now with female (formerly BNCY1?)	RAE
5.13	male (MW-Y) with female (formerly BNCY1?)	RAE,DRB
5.21	pair (male = MW-Y) on N ¹ /4EE in sagebrush on reveg slope	RAE
5.23	apparently incubating	DRB,RAE
5.24	N ¹ /4EE	Chambers
5.27	N ¹ /4EE	DRB
5.30	N ¹ /4EE	DRB
6.13	N ¹ (3YY1E??) just predated by Common Kingsnake	Chambers
7.4	heard only	RAE
7.5	pair (male MW-Y) foraging together	RAE
7.29	pair (male MW-Y) foraging together	RAE
BNCY27	[habitat 2.3.6/4.6]	
2.16	unbanded pair	RAE
4.14	unbanded pair (im. male?)	RAE
4.25	not found (= BNCY29??)	RAE
4.28	unbanded male present; border dispute with 17	RAE
5.13	unbanded male (brief visit)	RAE
5.20	male heard only	DRB
6.8	pair at N ¹ /3-4YY (small) in <i>Gnaphalium</i>	RAE
7.3	male tending four juveniles in mustard across creek	RAE
7.29	unbanded pair in mustard etc. across creek	RAE
BNCY28	[habitat 2.8/4.6]	
2.29	pair banded (male = DG-LGM, 1996-9; female = O-YM, 1996-10)	DRB
4.14	male (DG-LGM) present	RAE
4.25	banded pair (DG-LGM and O-YM) present; male displaced male BNCY12(?)	RAE
5.26	banded pair (DG-LGM and O-YM) NB[?]; juveniles possibly also present	DRB
6.8	banded pair (DG-LGM and O-YM) tending fledglings in <i>Gnaphalium</i> nursery	RAE
BNCY29	[habitat 2.3.7]	
2.16	immature(?) male only	RAE
4.14	territory not really checked	RAE
4.25	unbanded male defending large territory and tending N ¹ /3YY(large) in buckwheat displaced male BNCY30	RAE
4.28	unbanded pair tending N ¹ /3YY(large)	RAE
5.13	N ¹ appears depredated	RAE,DRB
5.20	pair with one fledgling	DRB
5.23	pair N ² B	DRB
5.27	N ² failed	DRB
6.8	not found	RAE
7.3	pair foraging; no action	RAE
BNCY30	[habitat 2.3.1/4.6]	
dates?	unbanded male displaced by BNCY24	Chambers
4.25	unbanded male displaced by male BNCY29	RAE
4.28	unbanded pair with fledglings	RAE
5.13	unbanded pair with two fledglings; pair copulating	RAE,DRB
5.20	pair with two fledglings banded (male = MY/LG-R, 1996-18; female = MR/W-Y, 1996-19; Y = MY/LG-W, 1996-20;	DRB

Y = DBM-R/W, 1996-21)

7.11	banded pair (male = MY/LG-R; female = MR/W-Y) present; no sign of young	DRB
A (slopes above the wetland mitigation site)		
3.27	unbanded male present	RAE
4.26	unbanded male present	RAE
B (remnant css on landfill road)		
4.26	male with 1-2 fledglings	RAE

APPENDIX B

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 1997

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON STUDY AREA, 1997¹

		Observer(s)
BNCY1	[bisected by Ford Road - now limited to the south side; pair disintegrated in 1996; habitat ² 2.3.1/7.3]	
Jan-2.16	vacant	RAE
3.10	UB pair present	RAE
4.5	UB male present	RAE
4.14	UB male present	RAE
4.18	UB pair tending N ¹ /3YY in <i>Artemisia</i>	DRB,RAE
4.21	UB male tending N ¹ /3YY(banded: R/W-DBM, 1997-28; Y/LG-Y/LGM, 1997-29; Y/LG-RM, 1997-30) in <i>Artemisia</i>	DRB
5.1	not found	RAE
5.2	UB male (molting tail) appeared to be alone; banded female (M-R/WLB, 1997-D; nestling at the Turtle Rock fragments in 1996) flies over road from BNCY26 to BNCY1W	RAE
5.4	UB male (molting tail) appeared to be alone, advertising desperately	RAE
5.16	UB male present	RAE
5.24	UB male now paired with banded female (M-R/WLB); agnostic encounter with UB female at wetland restoration edge occurs; abandoned N ¹ /3EE in <i>Artemisia</i> may have been within the irrigation spray zone	DRB
6.3	UB male and banded female (M-R/WLB) present, status unknown	DRB
6.28	not found	RAE
10.12-13	not found	RAE
BNCY2	[temporarily split in 1997; habitat 2.3.4/2.3.1]	
2E		
2.16	UB male with banded female (MLP-DB, 1996-28; nestling at BNCY18 in 1996); battles male 2W	RAE
2.18	UB male with banded female (MLP-DB)	RAE
3.8	UB male with female (legs not seen)	RAE
4.5	UB male and banded female (MLP-DB) N ¹ B in <i>Artemisia</i>	RAE
4.11	banded female (MLP-DB) seen	DRB
4.14	UB male with banded female (MLP-DB)	RAE
4.14	UB male on N ¹ in <i>Artemisia</i> (apparently incubating)	DRB
4.18	N ¹ failed; UB male and female (...M-R/W...) now in vicinity, but wide-ranging	DRB
4.30	UB male advertising from borders of the whole territory	RAE
5.2	UB male and female (banded?) apparently near N ² ; male battles male 18	RAE
5.4	UB male with banded female (MLP-DB) near N ² /1E in <i>Artemisia</i>	RAE
5.11	UB male on N ² /3EE in <i>Artemisia</i>	RAE
5.17	UB male on N ² /3EE in <i>Artemisia</i>	RAE
5.28	UB male and banded female (MLP-DB) feeding N ² /3YY	DRB
6.4	UB male and banded female (MLP-DB) present, N ² apparently failed; juvenile (M-LGY/LG, 1997-B; from UCI) also present	DRB
6.6	UB male and banded female (MLP-DB) present, N ² failed	DRB
6.28	1-2 birds present, no action apparent	RAE
7.16	pair banded (male: MW-B, 1997-75; female now: MR/W-DB, 1996-28); another male (M-OW/R, 1997-76; =BNCY3?; cap 1/2 gone) and juvenile (MR/W-DB, 1997-77; whence?) banded	DRB
10.12	one heard only	RAE
2W		
2.16	UB male present; battles male 2E	RAE
3.8	UB pair present	RAE
4.5	territory subsumed into 2E	RAE
BNCY3	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1; habitat is 2.3.1/4.6(<i>Brassica</i>)]	
2.16	UB pair present; male battles male 9	RAE

1 Band colors: B, black; DB, dark blue; DG, dark green; LB, light blue; LG, light green; LP, light pink; M, metal (USFWS); O, orange; P, purple; R, red; W, white; Y, yellow; R/W, red over white split-color band, etc.

2 Habitat designations follow Gray and Bramlet (1992): 2.3.6 (Sagebrush Scrub), 2.3.7 (Buckwheat Scrub), 2.3.10 (Mixed Sage Scrub), 2.3.12 (Sagebrush-Coyote Bush Sage Scrub), 2.7 (Chenopod Scrub), 2.8.1 (Sagebrush-Grassland), 2.8.2 (Buckwheat-Grassland), 2.8.5 (Mixed Sage Scrub-Grassland), 4.1 (Annual Grassland), 4.6 (Ruderal), 7.3 (Mulefat Scrub)

3.8	UB pair present	RAE
4.5	UB pair present, ventured well into <i>Brassica</i> on the bottom	RAE
4.14	UB pair foraging in <i>Brassica</i> and CSS	DRB,RAE
4.30	UB pair incubating N ¹ /3EE in <i>Artemisia</i> ; foraging in <i>Brassica</i> and CSS	RAE
5.11	N ¹ empty/failed; UB pair present	RAE
5.17	UB pair present	RAE
5.22	UB pair foraging in <i>Brassica</i>	DRB
5.25	UB pair apparently present but up to nothing	DRB
5.26	UB pair foraging in CSS and <i>Brassica</i> , apparently no action	DRB
6.28	UB pair foraging in CSS and <i>Brassica</i> , apparently no action	RAE
7.12	pair present, female banded (MW/R-R, 1997-70)	DRB
7.16	see note under BNCY2	
10.12	one heard only	RAE
BNCY4	[W portion of BNCY5; perhaps never a territory - juveniles observed in June 1994 may have come from elsewhere; habitat 2.4/2.3.1]	
BNCY5	[split in 1997?; habitat 2.4/2.3.6]	
2.16	UB male present (=BNCY19?)	RAE
5N		
3.8	banded male (LBP-M, 1996-2) and UB female N ¹ B in flagged <i>Artemisia</i>	RAE
5S		
3.10	UB pair (≠ BNCY19 or BNCY5N) S of the spillway	RAE
4.5	UB male just S of the spillway (=5N?, 5S?, 19?)	RAE
4.11	banded male (LBP-M) and UB female N ² B in <i>Encelia</i> in the BNCY4 portion of territory	DRB
4.30	banded male (LBP-M) foraging S of the spillway, then moving to the north side	RAE
5.11	banded male (LBP-M) foraging north of the spillway	RAE
5.17	banded male (LBP-M) and UB female tending N ³ /4YY(midsized) in <i>Artemisia</i> S of spillway UB male visits territory as well (BNCY19?)	RAE
5.18	banded male (LBP-M) and UB female tending N ³ /4YY(midsized) in <i>Artemisia</i> S of spillway	RAE
5.22	UB female tending N ³ /4YY(large) in <i>Artemisia</i>	RAE,DRB
5.22	banded juvenile from BNCY6 (BM-Y/LG, 1997-23) present	DRB
5.25	banded male (LBP-M, 1996-2) and UB female tending N ³ /4YY in <i>Artemisia</i>	DRB
5.29	banded male (LBP-M) and UB female tending four fledglings	DRB
6.1	family present; female (R/WB-M, 1997-45) and three (Y/LGY/LG-M, 1997-46; R/WY/LG-M, 1997-47; B-MR/W, 1997-48) of four juveniles banded; dispersing juvenile from BNCY6 (DBM-Y/LG, 1997-22) also present	DRB
6.28	banded pair (LBP-M and R/WB-M) in CSS; four banded juveniles (Y/LGY/LG-M and B-MR/W local; BM-Y/LG from BNCY6; BDG-M, 1997-39 from BNCY18) mostly in <i>Hemizonia</i> on the adjacent slope	RAE
7.20	dispersing juvenile (R/WM-Y/LG, 1997-25) from BNCY27 observed	DRB
10.12	three groups found: banded male (LBP-M) with banded female (BM-Y/LG, born at BNCY6 in 1997) at the west end; banded female (R/WB-M) alone in the middle; and banded male (combination?, -W/R) with UB female at the east end	RAE
12.3	banded male (M-OW/R, 1997-26; banded at BNCY2 in July) with banded female (BM-Y/LG) at BNCY5S [habitat 2.3.1, some of it revegetated]	RAE
BNCY6		
2.16	UB pair present	RAE
3.10	UB pair present	RAE
4.5	UB female present	RAE
4.11	UB pair tending N ¹ /4YY(large) in <i>Artemisia</i>	DRB
4.18	pair with 4 fledglings banded (male = MB-R, 1997-19; female = WM-Y/LG, 1997-24; YY = PM-Y/LG, 1997-20, LBM-Y/LG, 1997-21, DBM-Y/LG, 1997-22, BM-Y/LG, 1997-23)	DRB
5.16	loose family group on riparian edge included banded juvenile (DBM-Y/LG)	RAE
5.22	dispersing juvenile (BM-Y/LG) moved to BNCY5	DRB
5.25	not found	DRB
5.29	banded pair (male = MB-R; female = WM-Y/LG) focusing on the E patch	DRB
5.30	female (banded?) present	DRB
5.31	dispersing juvenile (LBM-Y/LG) seen W of BNCY7	DRB
6.28	banded pair (MB-R; WM-Y/LG) tending 2-4 fledglings in CSS (middle) and <i>Hemizonia</i> on the slope	RAE
7.10	banded pair (MB-R; WM-Y/LG) tending 3 juveniles (banded: W/RM-W, 1997-57; LG/YM-W, 1997-58; W/RM-O, 1997-59)	DRB

	10.12	banded pair (MB-R; WM-Y/LG) present; dispersed young female (BM-Y/LG) "paired" at BNCY5	RAE
BNCY7		[most of territory cleared/graded in Jan/Feb 1997, more impacted in June 1997, habitat 2.3.6/4.6(<i>Brassica</i>)]	
	2.16	UB male present; battles male BNCY9	RAE
	3.8	UB male and UB? female present	RAE
	4.5-6	UB male and UB? female present	RAE
	4.11	UB pair present	DRB
	4.12	UB pair present	DRB
	4.18	UB pair apparently incubating at N ¹ on <i>Opuntia prolifera</i> pad	DRB
	4.30	UB pair N ² B(lining) new N ² in <i>Cynara</i>	RAE
	5.11	<i>Cynara</i> N ² gone/failed; UB pair in the original <i>Artemisia</i> patch	RAE
	5.17	UB male present	RAE
	5.25	N ³ /3EE in <i>Artemisia</i>	DRB
	5.28	N ³ /3EE in <i>Artemisia</i>	DRB
	5.31	UB pair at N ³ /3EE in <i>Artemisia</i> ; two dispersing juveniles on revegetation slope to W: (PM-R/W from BNCY31 and LBM-Y/LG, 1997-21 from BNCY6)	DRB
	6.2	UB pair tending N ³ /3EE in <i>Artemisia</i>	DRB
	6.28	not found, N ³ failed?; recent drainage construction in the immediate area; UB female on revegetation/ruderal (<i>Stephanomeria/Hemizonia/Melilotus alba</i>) slope to the W = BNCY7?	RAE
	7.13	pair present (banded: female W/RM-P, 1997-71; male YM-W/R, 1997-72)	DRB
	10.12	not found	RAE
BNCY8		[cleared/graded in Jan/Feb 1997; habitat 2.3.1]	
BNCY9		[most of territory cleared in Jan/Feb 1997; habitat 2.3.1/4.6(<i>Brassica</i>)]	
	2.16	banded male (MO-LP, 1996-29) and UB female present; male battles males 3 and 7; females slips into lower BNCY3	RAE
	2.18	banded male (MO-LP) present; battles male 3	RAE
	3.8	banded male (MO-LP) and UB? female present	RAE
	4.5	banded male (MO-LP) & UB male battle constantly & pursue banded female (R/W?)	RAE
	4.12	banded male (MO-LP) and UB female tending N ¹ /4YY in <i>Artemisia</i>	DRB
	4.14	banded male (MO-LP) and UB female tending N ¹ /4YY (banded: LBM-B, 1997-15; DBM-B, 1997-16; R/WM-B, 1997-17; MB-W, 1997-18)	DRB,RAE
	4.30	banded male (MO-LP) present, no evidence of female or YY	RAE
	5.11	banded male (MO-LP) and UB female incubating N ² /2EE in <i>Artemisia</i>	RAE
	5.17	UB female on N ² /2EE in <i>Artemisia</i>	RAE
	5.25	N ² failed; banded male (MO-LP) and UB female present	DRB
	6.28	banded male (MO-LP) and UB female in CSS and <i>Brasica/Conium</i> , apparently no action	RAE
	7.12	banded male (MO-LP; cap now half molted) and UB female in <i>Brasica/Conium</i> , no action	DRB
	7.16	pair present, male bands changed (now M-BB)	DRB
	10.12	not found	RAE
BNCY10		[cleared/graded in Jan/Feb 1997; habitat was 2.3.1]	
BNCY11		[partially cleared/graded in Jan/Feb 1997; habitat 2.3.10(<i>Artemisia/Toxocodendron/Mimulus/Eriogonum</i>)]	
	1.31	UB male present	RAE
	2.16	UB pair present	RAE
	2.18	heard only	RAE
	3.8	UB pair N ¹ B in <i>Artemisia/Mimulus</i>	RAE
	4.5	heard only	RAE
	4.14	UB pair tending N ¹ /4YY (small) in <i>Artemisia</i>	DRB
	4.18	N ¹ found failed ...	DRB
	4.30	not found	RAE
	5.2	UB male present	RAE
	5.4	UB pair apparently incubating	RAE
	5.11	UB male present; N below wall??	RAE
	5.17	UB pair foraging together; no nesting action?	RAE
	5.22	UB pair foraging together; no nesting action?; failed N ² found	DRB
	5.28	UB pair tending N ³ /3EE in <i>Artemisia</i>	DRB
	6.2	UB pair tending N ³ /3EE in <i>Artemisia</i>	DRB
	6.28	UB pair tending three fledglings	RAE
	7.12	pair (banded: female W/RM-DB, 1997-67; male RM-LG/Y, 1997-69) tending 3 juveniles	

	(banded: W/RM-LB, 1997-65; BM-LG/Y, 1997-66; LG/YM-DB, 1997-68)	DRB
10.12	banded pair (male RM-LG/Y ; female W/RM-DB) present	RAE
BNCY12	[most of territory cleared/graded in Jan/Feb 1997, more cleared in June/July 1997; habitat was 2.4/2.8/4.6; habitat is 4.6(<i>Brassica</i>)/2.3.6(trace)]	
2.17	banded male (DGM-Y/LG, 1996-22) and UB female present in grassland/ <i>Brassica</i> /ruderal with remnant CSS	RAE
3.9	UB male advertising from small <i>Brassica</i> patch at far N end of former territory	RAE
4.6	UB male advertising from <i>Brassica</i> and willows at E edge of former territory	RAE
4.13	UB pair in <i>Brassica</i> at north end	DRB
4.20	UB pair near several <i>Artemisia</i> in <i>Brassica</i> at north end	DRB
5.18	UB male on N ¹ /3EE in <i>Cynara</i>	RAE
5.22	UB male tending N ¹ /3YY in <i>Cynara</i>	RAE,DRB
6.7	UB pair upstream, near bridge, alone; N ¹ apparently failed	DRB
7.20	most of territory now cleared	DRB
10.6	not found	RAE
BNCY13	[impacted by New Ford Road construction; not used in 1995-96; habitat 2.3.1/4.6(<i>Brassica</i>)]	
Jan	vacant	RAE
2.17	UB pair present	RAE
3.16	UB pair present	RAE
4.6	UB pair tending N ¹ /EE in <i>Encelia</i>	RAE,DRB
4.19	UB pair at N ¹ /3YY1E in <i>Encelia</i>	DRB
5.1	UB female tending N ¹ /YY in <i>Encelia</i>	RAE
5.4	UB pair tending 3-4 fledglings in <i>Brassica</i> nursery	RAE
5.24	female (Y/LG-LGM, 1997-31) and two (Y/LG-OM, 1997-32, Y/LG-LBM, 1997-33) of three juveniles banded	DRB
6.28	UB male and female (Y/LG-LGM) present, apparently no action	RAE
6.29	dispersing juvenile (Y/LG-OM) seen at BNCY25	RAE
10.14	not found	RAE
BNCY14	[habitat 7.3/2.3.1]	
1.24	UB male present	RAE
2.18	not found	RAE
2.26	pair present, heard only	RAE
3.10	heard only	RAE
4.14	not found	RAE
4.16	apparently this UB male is now unmated; vocal/territorial in <i>Brassica</i> /ruderal below BNCY-B	RAE
4.17	UB male feeding fledgling Bushtits in the mulefat	RAE
April/May	not found during several brief visits	RAE
6.30	UB male apparently paired with banded juvenile (M-BY, 1997-C ; from UCI)	RAE
7.21	UB male apparently paired with banded juvenile (M-BY ; from UCI)	DRB
10.6	not found	RAE
10.13	not found	RAE
BNCY15	[broad strip along MacArthur cleared in late summer 1997; habitat 2.3.9/2.7/7.3]	
2.16	UB male present	RAE
2.17	UB pair present	RAE
3.9	UB pair present	RAE
3.16	UB pair present	RAE
4.6	UB male present	RAE
4.13	UB pair tending N ¹ /4YY in <i>Atriplex</i>	DRB
4.19	UB pair tending N ¹ /4YY in <i>Atriplex</i>	DRB
4.21	N ¹ found predated	DRB
5.18	UB male present	RAE
5.26	UB pair present	DRB
6.2	UB male present, female possibly incubating	DRB
6.29	status unknown, three birds present: two battling UB males (one also battles male 16 and one also battles the banded juvenile) and a banded juvenile (PDB-M, 1997-37 , from BNCY30)	RAE
7.19	pair present (male banded: DBLB-M, 1997-78) in BNCY15S; pair present (male banded: M-W/RLG, 1997-79 , from BNCY25?; female: PDB-M, 1997-37) in BNCY15N	DRB
10.14	pair present (female: PDB-M ; male not seen)	RAE
BNCY16	[broad strip along MacArthur cleared in late summer 1997; habitat 2.3.10/2.3.9/2.7]	
2.16	heard only	RAE

	3.9	UB male present	RAE
	3.16	UB pair present	RAE
	4.6	UB pair tending N ¹ /large YY in <i>Atriplex</i>	RAE
	4.13	male (BM-DB, 1997-6), female (R/WM-R/W, 1997-7), and 3 fledglings (YM-B, 1997-8; WM-B, 1997-9; LGM-B, 1997-10) banded	DRB
	4.19	banded pair (male BM-DB, female R/WM-R/W) tending 3 fledglings (YM-B, WM-B, LGM-B)	DRB
	5.18	three banded fledglings (YM-B, WM-B, LGM-B) foraging loosely together	RAE
	5.26	banded pair (male BM-DB, female R/WM-R/W) N ² B in <i>Atriplex</i>	DRB
	6.29	banded male (BM-DB) battles UB male at BNCY15; local banded female not found; banded female (O-YM) from destroyed BNCY28 present and alone	RAE
	10.14	banded male (BM-DB) with banded female (O-YM)	RAE
BNCY17		[most of territory cleared/graded in Jan/Feb 1997; habitat 2.3.6/4.6]	
	2.16	banded pair present (male YLP-M, 1996-31; female LBY-M, 1996-8)	RAE
	3.9	banded pair present (male YLP-M; female LBY-M); NB?	RAE
	4.6	banded pair foraging together (male YLP-M; female LBY-M)	RAE
	4.13	banded pair (male bands changed to YW/R-M; female LBY-M) tending 1 fledgling (DGM-B, 1997-11)	DRB
	5.1	banded pair (male YW/R-M; female LBY-M) tending one fledgling (DGM-B)	RAE
	5.18	male (YW/R-M) on N ² /3EE in <i>Artemisia</i>	RAE
	5.22	male (YW/R-M) on N ² in <i>Artemisia</i>	RAE, DRB
	5.26	banded pair (male YW/R-M; female LBY-M) tending N ² /3YY in <i>Artemisia</i>	DRB
	6.7	banded pair (male YW/R-M; female LBY-M) tending three fledglings (banded: W/RM-Y, 1997-52; W/RM-LG, 1997-53; LG/YM-Y, 1997-54)	DRB
	6.29	banded pair (male YW/R-M; female LBY-M) tending 2-3 juveniles (inc. W/RM-LG); UB juvenile moves in from BNCY27	RAE
	10.6	banded male (YW/R-M) with UB female	RAE
BNCY18		[habitat 2.4/2.3.1]	
	2.16	banded male (YM-LP; 1996-27) and UB female present	RAE
	3.8	UB pair present	RAE
	3.10	UB pair present	RAE
	4.5	UB pair present	RAE
	4.11	UB female present	DRB
	4.14	UB pair present	RAE
	4.14	banded female (...R/W...) seen; also a wide-ranging UB male	DRB
	4.30	pair near gate	RAE
	5.1	UB pair near gate, male moves N over the knoll	RAE
	5.2	UB pair tending N ¹ /4YY in <i>Encelia</i>	RAE
	5.4	UB pair tending N ¹ /4YY in <i>Encelia</i>	RAE
	5.11	N ¹ /4YY in <i>Encelia</i>	RAE
	5.16	UB pair tending 3-4 fledglings	RAE
	5.18	UB pair tending 3-4 fledglings	RAE
	5.25	male (R/W-MR/W, 1997-42), female (LBDB-M, 1997-43), and four juveniles (B-MB, 1997-38; BDG-M, 1997-39; BR/W-M, 1997-40; BY/LG-M, 1997-41) banded	DRB
	5.31	male (R/W-MR/W), female (LBDB-M), and four juveniles (B-MB, BDG-M, BR/W-M, BY/LG-M) present	DRB
	6.28	banded pair (male = R/W-MR/W, female = LBDB-M) present, apparently no action; dispersing juvenile (BDG-M) seen at BNCY5	RAE
	10.12	banded pair present; also banded male (R/WM-Y/LG, 1997-25, born at BNCY27 in 1997)	RAE
BNCY19		[perhaps not previously a territory; male seen occasionally in 1994, crossed to UCI; habitat 2.4/2.3.6]	
	2.16	vacant (but see BNCY5)	RAE
	3.8	UB pair present	RAE
	3.10	UB pair present	RAE
	4.5	see note under BNCY5	
	4.11	UB pair N ¹ B in <i>Encelia</i>	DRB
	4.30	UB pair N ² B (lining) new N ² in <i>Artemisia</i>	RAE
	5.11	<i>Artemisia</i> N ² destroyed; UB male present	RAE
	5.17	UB pair present	RAE
	5.22	UB male present	DRB
	5.29	UB pair present	DRB
	5.30	not found; 80% of territory (<i>Encelia</i>) now desiccated	DRB

6.1	UB male N ³ B (carrying only) at SE corner of BNCY5 (cactus S of spillway near cowbird trap)	DRB
6.8	pair banded (male: LG/YM-O , 1997-55; female: MLG/Y-Y , 1997-56); no evidence of nesting	DRB
6.17	wandering female (MLG/Y-Y) across the toll road on the UCI preserve (UCI7)	Melanie Madden
6.28	not found	RAE
7.17	displaced female (MLG/Y-Y) still across the toll road on the UCI preserve (UCI7)	DRB
10.12	not found	RAE
BNCY20	[habitat eliminated by New Ford Road construction; not used since 1994; habitat was 7.3/2.8]	
BNCY21	[perhaps never a territory; family groups seen in 1994 & 1995 may have come from elsewhere (e.g., BNCY25); habitat was 2.7/2.3.9]	
BNCY22	[habitat eliminated by SJHTC construction; not used since 1994; habitat was 2.7]	
BNCY23	[partially cleared/graded in Jan/Feb 1997; habitat 2.3.1]	
2.16	UB present	RAE
3.9	UB pair present	RAE
4.6	UB pair tending N ¹ /4YY (~12 days old) in <i>Artemisia</i>	RAE, DRB
4.12	male (BM-W , 1997-1), female (R/WM-LG , 1997-2) and 3 fledglings (Y/LGM-DG , 1997-3; R/WM-W , 1997-4; BM-O , 1997-5) banded	DRB
5.17	banded pair (male BM-W , female R/WM-LG) present	RAE
5.24	banded pair (male BM-W , female R/WM-LG) at N ² in <i>Artemisia</i>	DRB
5.28	banded female (R/WM-LG) at N ² /2YY1E in <i>Artemisia</i>	DRB
6.4	three nestlings banded (R/W-Y/LGM , 1997-49; W/RM-R , 1997-50; LG/YM-R , 1997-51)	DRB
6.28	banded pair (male BM-W , female R/WM-LG) tending 2-3 fledglings (inc. W/RM-R , LG/YM-R)	RAE
10.12	banded pair (male BM-W , female R/WM-LG) present	RAE
BNCY24	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1/4.6]	
	late Feb+ vacant, but see comments under BNCY30	
BNCY25	[habitat 2.7/7.3/2.3.13]	
2.16	UB male present	RAE
3.9	UB male present; aborted several attempted flights far to the north	RAE
3.16	UB male present	RAE
4.6	UB male present	RAE
4.19	UB male present	DRB
5.4	UB male present	RAE
5.17	UB male present	RAE
6.29	four birds present: two UB males (one with crown nearly fully molted to basic plumage, therefore the resident non-breeder??); UB juvenile; banded juvenile (Y/LG-OM) from BNCY13	RAE
10.14	UB pair present	RAE
BNCY26	[habitat 2.3.1]	
2.16	banded male (MW-Y , 1996-3) and female (h.o.) present	RAE
2.18	banded male (MW-Y) and UB female present	RAE
3.10	banded male (MW-Y) and UB female present	RAE
4.5	banded male (MW-Y) present	RAE
4.11	banded male (MW-Y) and UB female present	DRB
5.1	banded male (MW-Y) foraging on slope near BNCY18, then joins female in core of territory; later, UB pair in core of territory! (=BNCY1?)	RAE
5.2	banded male (MW-Y) and UB female near N; banded female (M-R/WLB , 1997-D; banded as nestling at the Turtle Rock fragments in 1996) visits briefly, then flies to BNCY1W	RAE
5.4	banded male (MW-Y) and UB female incubating N ¹ /3EE in <i>Eriogonum</i>	RAE
5.11	N ¹ /4EE in <i>Eriogonum</i>	RAE
5.16	N ¹ predated/destroyed	RAE
5.24	male (MW-Y) at N ² in <i>Artemisia</i> , apparently on EE	DRB
5.29	UB female at N ² /EE in <i>Artemisia</i>	DRB
5.31	N ² /EE in <i>Artemisia</i>	DRB
6.2	N ² /3YY1E in <i>Artemisia</i>	DRB
6.28	banded male (MW-Y) and UB female tending 3-4 fledglings	RAE
7.10	banded male (MW-Y) and female (banded: BM-W/R , 1997-60) tending 4 fledglings (banded: LG/YM-LG , 1997-61; LG/YM-DG , 1997-62; LG/YM-P , 1997-63; LG/YM-DB , 1997-64)	DRB
10.12	banded pair (female BM-W/R ; male MW-Y)	RAE
10.23	banded pair (female BM-W/R ; male MW-Y)	RAE
12.3	banded pair (female BM-W/R ; male MW-Y)	RAE

12.31	banded pair (female BM-W/R ; male MW-Y)	RAE
BNCY27	[most of territory cleared/graded in Jan/Feb 1997, more cleared in March and May 1997; habitat was 2.3.6, habitat is 2.3.6/4.6]	
2.16	UB pair present	RAE
3.9	UB pair present; includes <i>Brassica</i> and tree tobacco west of the creek	RAE
4.6	UB male present, battles male 28, who has moved into the <i>Brassica</i> /tobacco in BNCY27W	RAE
4.13	UB pair tending N ¹ /3YY (small) in <i>Artemisia</i>	DRB
4.19	UB pair tending N ¹ /3YY (banded: R/WM-Y/LG, 1997-25; R/W-R/WM, 1997-26; R/W-DGM, 1997-27)	DRB
4.20	UB pair tending N ¹ /3YY (R/WM-Y/LG; R/W-R/WM; R/W-DGM) in <i>Artemisia</i>	DRB
5.1	UB pair tending at least two fledglings (R/WM-Y/LG; R/W-R/WM)	RAE
5.18	UB pair tending one fledgling (R/WM-Y/LG) in mustard/tree tobacco in BNCY27W	RAE
5.22	UB pair tending one fledgling in <i>Artemisia</i> patch (recently reduced ca. 15% in area according to DRB); mustard/tree tobacco in BNCY27W also considerably reduced in size	RAE, DRB
5.26	male (BB-M, 1997-44) banded today; no sign of female	DRB
6.7	male (BB-M) and UB female present	DRB
6.29	pair not found; UB juvenile present and moves to BNCY17	RAE
7.20	dispersing juvenile (R/WM-Y/LG) observed at BNCY5	DRB
10.6	pair from BNCY17 also here	RAE
10.12	dispersed young male (R/WM-Y/LG) alone at BNCY18	RAE
BNCY28	[most of territory cleared/graded in Jan/Feb 1997, remainder cleared in March 1997; habitat now 4.6]	
2.16	pair (male DG-LGM, 1996-9 ; female O-YM, 1996-10) present in <i>Brassica</i> /ruderal and remnant CSS	RAE
3.9	banded pair (male DG-LGM ; female O-YM) in <i>Brassica</i> trim at slope top	RAE
4.6	banded pair (male DG-LGM ; female O-YM) foraging in <i>Brassica</i> /tree tobacco in BNCY27W	RAE
4.13	male (banded?) only found	DRB
April/May	not found on subsequent visits	RAE
6.29	banded female (O-YM) found at BNCY16	RAE
10.14	banded female (O-YM) "paired" at BNCY16	RAE
BNCY29	[most of territory cleared/graded in Jan/Feb 1997; remainder in March 1997; habitat was 2.3.7]	
2.16, 3.9	vacant	RAE
BNCY30	[mostly cleared/graded in Jan/Feb 1997, more cleared in May 1997; habitat was 2.3.1/4.6, now 2.8 (deerweed)/4.6]	
	Feb/Mar male moved to slopes at far N end of BNCY24	RAE
2.16	banded male (MY/LG-R, 1996-18) and UB female on slopes at far N end of BNCY24	RAE
3.9	banded male (MY/LG-R) and UB female NB in deerweed at far N end of BNCY24	RAE
4.6	male (MY/LG-R) and UB female moved back here, possibly incubating	RAE, DRB
4.12	male (MY/LG-R) and UB female N ¹ B in <i>Lessingia</i>	DRB
4.20	male (MY/LG-R) incubating at N ¹ in <i>Lessingia</i>	DRB
5.1	male (MY/LG-R) and UB female incubating N ¹ /4EE in <i>Lessingia</i>	RAE
5.11	N ¹ /4YY in <i>Lessingia</i>	RAE
5.16	N ¹ site destroyed by construction activities; fate of YY unknown	RAE
5.17	male (MY/LG-R) and UB female tending four fledglings in <i>Lotus scoparia</i> and <i>Hirschfeldia</i>	RAE
5.24	female (B-MDB, 1997-34) and "all" three fledglings (Y/LG-BM, 1997-35; Y/LG-R/WM, 1997-36; PDB-M, 1997-37) banded	DRB
6.4	entire banded family on slopes and in riparian bottom between BNCY30 and BNCY23	DRB
6.7	banded pair (male MY/LG-R , female B-MDB) tending at least two banded juveniles	DRB
6.28	heard only	RAE
6.29	dispersing juvenile (PDB-M) seen at BNCY15	RAE
10.6	banded pair (male MY/LG-R , female B-MDB) foraging in <i>Hirschfeldia</i> etc.	RAE
10.14	dispersed female (PDB-M) "paired" at BNCY15	RAE
BNCY31	[habitat 2.3.1]	
March	pair present	JNK
4.5	UB pair; nest exchange?	RAE
4.14	UB male tending N ¹ /3YY (banded: LGM-R/W, 1997-12; DGM-R/W, 1997-13; PM-R/W, 1997-14) in <i>S. mellifera</i>	RAE, DRB
4.23	at least 2 fledglings present, including PM-R/W	JNK
5.1	UB pair tending three fledglings (LGM-R/W; DGM-R/W; PM-R/W)	RAE
5.30	UB pair present	DRB
5.31	dispersing juvenile (PM-R/W) seen W of BNCY7	DRB
6.3	UB pair tending new N ² /3EE in <i>Artemisia</i> ;	

	dispersing juvenile (PM-R/W) now back on natal territory and chased into willows by UB male	DRB
6.28	UB pair present, N ² empty and apparently failed	RAE
6.30	not found	RAE
June/July	dispersing juvenile (DGM-R/W) present at Coyote Canyon	Paul Galvin
7.15	pair present (female banded: RM-W/R, 1997-74) with 2 juveniles (one banded: LG/YM-B, 1997-73)	DRB
7.21	UB male present and one juvenile (banded: OM-LG/Y, 1997-82; may not be local product)	DRB
7.29	UB male present and apparently alone	RAE
10.13	banded male (OM-LG/Y) "paired" with UB female	RAE
BNCY-B	[most of territory cleared in Jan/Feb 1997; habitat was 2.3.6/2.3.10, habitat is 2.8.1/4.6]	
4.16	UB male tending N ¹ /3YY (small) in <i>Artemisia</i>	RAE
4.18	N ¹ /2YY	DRB,RAE
5.1	UB pair tending two fledglings	RAE
6.6	UB female on new N ² /3EE in <i>Artemisia</i>	DRB
6.30	UB male (head molt begun, therefore nesting over??) advertising throughout the cleared core of his former territory, now regrowing with ruderal vegetation; female not found; N ² apparently failed	RAE
7.20	pair present and banded (female M-W/RP, 1997-80; male LBB-M, 1997-81)	DRB
10.6	pair present (male banded but combination not seen; female unseen)	RAE
BNCY-C	[habitat 4.1(<i>Brassica</i>)/4.6]	
4.16	UB pair foraging together	RAE
6.30	UB pair foraging together on all three sides of the intersection	RAE
BNCY-D	[habitat 4.6]	
4.16	UB male tending N ¹ /2-3YY (large) in <i>Cynara</i>	RAE
4.18	N ¹ now empty; failed?	DRB,RAE

APPENDIX C

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 1998

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 1998¹

		Observer(s)
BNCY1	[bisected by Bonita Canyon Road - now limited to the south side; habitat ² 2.3.1/7.3, a portion revegetated]	
1.4	none found	RAE
2.27	UB pair present	RAE
3.30	UB male present	DRB
4.1	UB pair present	DRB
5.13	UB pair present	DRB
5.18	UB pair present	DRB
5.24	not found	DRB
7.5	UB pair present; no action	DRB
7.15	UB pair present; no action	DRB
10.30	none found	RAE
BNCY2	[habitat 2.3.4/2.3.1, a small portion revegetated]	
1.4	banded pair (male RM-LG/Y , 1997-69, from BNCY11; female MR/W-DB , 1996-28) in 2W	RAE
3.27	banded pair (male M-W/RLG , 1997-79, from BNCY15; female MR/W-DB) at N ¹ /4EE in <i>Artemisia</i> in BNCY2/11	DRB
3.28	banded male (M-W/RLG) present in BNCY2	DRB
3.31	banded pair (male M-W/RLG , female MR/W-DB) present in BNCY2/11; N ¹ /4EE failed (predation)	DRB
5.12	banded pair (male M-W/RLG , female MR/W-DB) at N ² /1Y2EE in <i>Eriogonum</i> (edge of BNCY18)	DRB
5.14	banded pair (male M-W/RLG , female MR/W-DB) present; N ² failed (rain?)	DRB
5.17	banded pair (male M-W/RLG , female MR/W-DB) N ³ B in <i>Isocoma</i> along fence near BNCY18	DRB
5.22	banded pair (male M-W/RLG , female MR/W-DB) at N ³ /1E in <i>Isocoma</i>	DRB
5.27	banded pair (male M-W/RLG , female MR/W-DB) N ⁴ B in <i>Artemisia</i> at the base of BNCY2	DRB
5.29	N ⁴ now looks complete	DRB
7.3	banded pair (male M-W/RLG , female MR/W-DB) present in 2/11/18; N ⁴ failed	DRB
7.11	banded pair (male M-W/RLG , female MR/W-DB) present in 2/11/18; banded juvenile (M-RW/R , 1998-B = female?) also present	DRB
9.29	pair (male M-W/RLG with banded - UK - female) present; banded female (MW/R-R , 1997-78) and UB male (from BNCY5E) moved from css at the bottom of BNCY2 through mulefat to the mustard below BNCY3	RAE
10.28	banded male (M-W/RLG) and UK female present	RAE
11.30	banded pair (male M-W/RLG , female YM-DB) present in lower BNCY2; banded male (W/R-MY/LG , 1998-D; banded at UCI6 in 1998) between BNCY2, BNCY3, and BNCY5	RAE
BNCY3	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1; habitat is 2.3.1/4.6(<i>Brassica</i>); remainder of habitat cleared in July 1998]	
1.4	banded female (MW/R-R , 1997-70; later at BNCY5E) with UB male	RAE
3.28	banded female (unknown) with UB male	DRB
4.1	none found	DRB
5.11	unknown male seen (same as BNCY5E?)	DRB
8.29	UB male (still with largely black cap) in ruderal vegetation below BNCY3	RAE
9.29	banded female (MW/R-R) and UB male (from BNCY5E) moved from css at the bottom of BNCY2 through mulefat to the mustard below BNCY3	RAE
10.28	banded female (UK) and UK male in mustard below BNCY3	RAE
BNCY4	[W portion of BNCY5 from 1994-1997; juveniles observed in June 1994 may have come from elsewhere; habitat 2.4/2.3.1]	
1.4	banded male (LBP-M , 1996-2) with UB female; another bird heard only	RAE
2.27	one bird heard only	RAE
3.27	banded female (DBM-Y/LG , 1997-22; born at BNCY6 in 1997) with banded male (LBP-M) (failed N ¹ /3EE found in <i>Artemisia</i> - predation?)	RAE

1 Band colors: B, black; DB, dark blue; DG, dark green; LB, light blue; LG, light green; M, metal (USFWS); O, orange; P, purple; R, red; W, white; Y, yellow; R/W, red over white split-color band, etc.

2 Habitat designations follow Gray and Bramlet (1992): 2.3.6 (Sagebrush Scrub), 2.3.7 (Buckwheat Scrub), 2.3.10 (Mixed Sage Scrub), 2.3.12 (Sagebrush-Coyote Bush Sage Scrub), 2.7 (Chenopod Scrub), 2.8.1 (Sagebrush-Grassland), 2.8.2 (Buckwheat-Grassland), 2.8.5 (Mixed Sage Scrub-Grassland), 4.1 (Annual Grassland), 4.6 (Ruderal), 7.3 (Mulefat Scrub)

3.30	banded female (DBM-Y/LG) with banded male (LBP-M)	RAE
3.31	banded female (DBM-Y/LG) with banded male (LBP-M)	DRB
5.11	banded pair (female DBM-Y/LG, male LBP-M) with fledglings	DRB
5.15	banded pair (female DBM-Y/LG, male LBP-M) with three fledglings young banded: DG-MW/R, 1998-9; W/R-MLG, 1998-10; and W/R-MLB, 1998-11)	DRB
7.3	three birds present (UK male; banded juvenile - combo. UK; UK female/juvenile), status unclear	DRB
7.4	banded female (DBM-Y/LG) chasing banded juvenile (M-RW/R, 1998-B, from UCI3/8); UK male and UB juvenile also present	DRB
7.12	banded pair (female DBM-Y/LG, male LBP-M) present; also banded juvenile (M-RW/R = female?)	DRB
10.28	banded female (UK) present at bottom of slope	RAE
10.29	banded pair (female MDG-R, 1998-39, banded at BNCY7; male UK, probably DB-MLG/Y, 1998-C) on SJHTC slopes to west, also ventured into willows and cat-tails (and one once flew across to BNCY7?)	RAE
11.30	banded pair (female DBM-Y/LG, male LBP-M) present; banded pair (female MDG-R; male DB-MLG/Y, from Crystal Cove Bluffs) on SJHTC slopes to the west	RAE
BNCY5	[habitat 2.3.1, most of it revegetated]	
2.27	banded female (MW/R-R, 1997-70; from BNCY3) with UB male S of spillway, second female (unk) displaced from 5E	RAE
3.27	banded female (MW/R-R) with UB male at N ¹ /2EE in <i>Encelia</i> south of spillway	DRB
3.30	banded female (MW/R-R) with UB male south of spillway	RAE
5.11	not found; male in BNCY3 may have been this one	DRB
5.12	UB male moved into <i>Brassica</i> below	DRB
5.15	banded female (MW/R-R) and UB male N ² B in <i>Artemisia</i>	DRB
5.17	banded female (MW/R-R) and UB male N ² B in <i>Artemisia</i>	DRB
5.22	N ² looks complete	DRB
5.29	UB male on N ² /EE in <i>Artemisia</i>	DRB
7.3	banded female (MW/R-R) and UB male present, N ² failed	DRB
7.7	female (MW/R-R) and UB male present; also banded juvenile (M-RW/R, 1998-B, from UCI3/8)	DRB
9.29	banded female (MW/R-R) and UB male moved from css at the bottom of BNCY2 through mulefat to the mustard below BNCY3	RAE
10.28	banded female (MW/R-R) and UK male present	RAE
BNCY6	[habitat 2.3.1, much of it revegetated]	
1.4	none found	RAE
3.27	banded female (WM-Y/LG, 1997-24) and UB male N ¹ B	DRB
3.30	UB male N ¹ B (platform) in <i>Artemisia</i> in 6W	RAE
5.11	unknown female present	DRB
5.14	banded female (WM-Y/LG) and UB male N ² B in <i>Artemisia</i>	DRB
5.22	banded female (WM-Y/LG) at N ² /3EE	DRB
7.4	banded female (WM-Y/LG) with male and four fledglings (all banded: male MR-R, 1998-31; young PM-DG, 1998-32; M-LGDG, 1998-33; MDB-DG, 1998-34; MDB-DB, 1998-35)	DRB
10.28	banded pair (male MR-R, female WM-Y/LG) at far east end	RAE
BNCY7	[most of territory cleared/graded in Jan/Feb 1997, more impacted in June 1997, habitat 2.3.1/4.6(<i>Brassica</i>); upper 40% of remaining habitat cleared in July 1998]	
1.4	banded male (M-BB, 1996-29, from BNCY9) with unknown female in lower BNCY7 & lower BNCY9	RAE
3.28	pair (unknown) at N ¹ /4EE in <i>Artemisia</i>	DRB
4.1	banded pair (male M-BB, female W/RM-P, 1997-71, BNCY7 in 1997) present in BNCY7/9; another banded female seen (possibly MW/R-R, 1997-70, from BNCY5E)	DRB
4.27	banded pair (male M-BB, female W/RM-P) tending three fledglings	MM
5.4	banded pair (male M-BB, female W/RM-P) tending three fledglings	MM
5.11	banded male (M-BB) present	DRB
5.12	banded pair (male M-BB, female W/RM-P) with fledglings	DRB
5.15	banded pair (male M-BB, female W/RM-P) with three fledglings; young banded: O-MW/R, 1998-12; O-MY/LG, 1998-13; and W/R-MO, 1998-14	DRB
5.27	three juveniles present, one (W/R-MO) with herbicide on its legs; UB male in BNCY9	MM
6.5	juveniles present, but no sign of adults	MM
6.12	banded pair (male M-BB, female W/RM-P) present	MM
6.19	banded pair (male M-BB, female W/RM-P) at N ² /YY in <i>Artemisia</i> ; banded juvenile (Y/LG-MP, 1998-23, from BNCY18) chased away	MM
6.27	banded pair (male M-BB, female W/RM-P) tending two fledglings	MM

6.30	banded pair (male M-BB , female W/RM-P) tending two fledglings; two juveniles (Y/LG-MP ; UB) also present	MM
7.6	UK male and two juveniles (one banded, not on natal territory: MDG-R , 1998-39) present	DRB
7.7	banded pair (male M-BB , female W/RM-P) with two fledglings (banded: MDB-W , 1998-40; MDG-LG , 1998-41) in BNCY7/9 ; foreign juvenile (MDG-R) still present	DRB
7.17	banded male (M-BB) tending two fledglings (MDB-W , MDG-LG); juvenile (Y/LG-MP) chased away	MM
7.25	banded male (M-BB) tending two fledglings (MDB-W , MDG-LG)	MM
10.28	none found	RAE
BNCY8	[cleared/graded in Jan/Feb 1997; habitat was 2.3.1]	
BNCY9	[most of territory cleared in Jan/Feb 1997; habitat 2.3.1/4.6(<i>Brassica</i>); upper 75% of remaining habitat cleared in July 1998]	
1.4	banded male (M-BB , 1996-29) with unknown female in lower BNCY7 & lower BNCY9	RAE
rest of season	merged with BNCY7	DRB
BNCY10	[cleared/graded in Jan/Feb 1997; habitat was 2.3.1]	
BNCY11	[partially cleared/graded in Jan/Feb 1997; habitat 2.3.10(<i>Artemisia/Toxocodendron/Mimulus/ Eriogonum</i>), some of it revegetated]	
1.4	none found, but see BNCY2 (male RM-LG/Y , 1997-69 there)	RAE
3.30	none found	RAE
9.29	male (MDB-Y , 1998-47; from BNCY17) and female (MP-Y , 1998-44; banded at BNCY26) present	RAE
10.28	banded male (MDB-Y) and banded female (MP-Y) present	RAE
11.30	banded pair (male MDB-Y , female MP-Y) present	RAE
BNCY12	[most of territory cleared/graded in Jan/Feb 1997, more cleared in June/July 1997; habitat was 2.4/2.8/4.6; habitat is 4.6(<i>Brassica</i>)/2.3.6(trace)]	
1.4,3.15,3.29,5.19,10.22	none found	RAE,DRB
BNCY13	[habitat 2.3.1/4.6(<i>Brassica</i>)]	
1.4,3.15	none found	RAE
3.29	UB pair at N ¹ /4EE in <i>Encelia</i>	DRB
5.13	UB male present	DRB
5.20	UB pair present	DRB
7.8	UB pair present in willows; no action	DRB
10.22	none found	RAE
BNCY14	[habitat 7.3/2.3.1/4.6; heavy sedimentation December 1997- February 1998; considerable clearing in Oct. 1998]	
2.27,4.1	none found	RAE,DRB
10.30	UB pair in mulefat and scrub south of the road	RAE
BNCY15	[broad strip along MacArthur cleared in late summer 1997; habitat 2.3.9/2.7/7.3]	
1.4	unknown male driven back by BNCY16 male	RAE
3.15	banded male (DBLB-M , 1997-78) paired with UB female	RAE
3.29	none found	DRB
5.18	banded male (DBLB-M) and UB female at N ¹ /5YY in <i>Atriplex</i>	DRB
5.25	banded male (DBLB-M) and UB female at N ¹ /5YY in <i>Atriplex</i>	DRB
5.27	banded male (DBLB-M) and UB female at N ¹ /5YY in <i>Atriplex</i>	DRB
5.28	banded male (DBLB-M) and UB female at N ¹ /5YY in <i>Atriplex</i> ; young banded: LG/Y-MLB , 1998-24; Y/LG-MB , 1998-25; LG/Y-MDG , 1998-26; M-LG/YB , 1998-27; and M-LG/YLB , 1998-28	DRB
	[successful fledgling: M-LG/YLB nested at BNCY7 the following year	
7.8	banded male (DBLB-M) and UB female chasing UB juvenile, eventually into BNCY25 ; no action	DRB
7.11	banded male (DBLB-M) and UB female present; no action	DRB
7.26	banded male (DBLB-M) and UB female present; no action	RAE
10.22	none found	RAE
BNCY16	[broad strip along MacArthur cleared in late summer 1997; habitat 2.3.10/2.3.9/2.7]	
1.4	unknown male drives off BNCY15 male	RAE
3.15	banded pair (male: BM-DB 1997-6; female: O-YM , 1996-10) present	RAE
3.29	banded pair (male: BM-DB ; female: O-YM) at N ¹ /4EE in <i>Atriplex</i>	DRB
5.18	banded female (O-YM) with two juveniles	DRB
5.19	unknown male with two juveniles	DRB
5.20	banded pair (male: BM-DB ; female: O-YM) with two juveniles; unknown male driven off to north young banded: R-MLG/Y , 1998-18 and B-MLG/Y , 1998-19	DRB
7.8	banded pair (male: BM-DB ; female: O-YM) at N ² /3EE in <i>Atriplex</i>	DRB
7.9	N ² /3EE in <i>Atriplex</i>	DRB

	7.26	banded female (O-YM) with UK male; N ² apparently failed	RAE
	10.21	dispersed young male (R-MLG/Y) with UB female found at UCI4/5	RAE
	10.22	none found	RAE
BNCY17		[most of territory cleared/graded in Jan/Feb 1997; habitat 2.3.6/4.6]	
	1.4	unknown male with UB female	RAE
	3.15	"advertising" UB female moves through grasslands to slopes across from BNCY12	RAE
	3.29	UB pair N ¹ B in <i>Artemisia</i>	DRB
	5.19	UB pair present	DRB
	7.11	UB pair with two fledglings in BNCY17/27	DRB
	7.12	banded the entire family (male MW-LB, 1998-45; female YM-R, 1998-46; fledglings MDB-Y, 1998-47; MLG-LG, 1998-48)	DRB
	9.29	banded young male (MDB-Y) present at BNCY11	RAE
	10.22	banded pair (male MW-LB; female YM-R) present	RAE
BNCY18		[habitat 2.4/2.3.1, much of it revegetated]	
	1.4	none found	RAE
	2.27	banded male (combination unknown) present	RAE
	3.27	banded pair (male: MW-B, 1997-75, from BNCY2; female:LBDB-M, 1997-43) at N ¹ /4EE in <i>Encelia</i>	DRB
	4.1	banded male (MW-B; from BNCY2) with banded female (LBDB-M) at N ¹ /4EE in <i>Encelia</i>	DRB
	5.11	banded female (LBDB-M) with UB male at N ² /4EE in <i>Isocoma</i>	DRB
	5.16	banded female (LBDB-M) with UB male at N ² /3YY1E in <i>Isocoma</i>	DRB
	5.23	banded female (changed to LB-MDB) and UB male at N ² /3YY1E in <i>Isocoma</i>	DRB
	5.27	banded female (LB-MDB) and UB male present but N ² failed; unknown juvenile banded: Y/LG-MP, 1998-23	DRB
	5.29	banded female (LB-MDB) and UB male N ² B in <i>Isocoma</i>	DRB
	7.3	banded female (LB-MDB) and UB male with 3 fledglings (2 banded: MDG-W, 1998-29; MP-W, 1998-30); two other birds present, one banded (M-RW/R, 1998-B, from UCI 3/8) and one UK	DRB
	7.5	banded female (LB-MDB) and UB male with 3 fledglings (UB, MDG-W, MP-W)	DRB
	7.8	banded juvenile (M-RW/R) with UB juvenile (siblings or incipient pair?)	DRB
	7.10	banded female (LB-MDB) and UB male with 3 fledglings (UB, MDG-W, MP-W)	DRB
	8.29	banded juvenile (MDG-W) loosely associating with BNCY26 pair and UB juvenile at BNCY26 border	RAE
	10.28	UB female at BNCY2/18 interface; banded female (LB-MDB) and UB male present in core of BNCY26	RAE
	11.30	banded female (LB-MDB) and UB male at BNCY18/26	RAE
BNCY19		[perhaps not previously a territory; male seen occasionally in 1994, crossed to UCI; habitat 2.3.1/2.3.6]	
	1.4.	male (M-LG/YR, 1998-A, banded as a nestling at TRFRA6 on 5.24.97; seen again at UCI7 with UB female 10.21.98) with female (PM-Y/LG, 1997-20, banded as a fledgling at BNCY6 on 4.18.97)	RAE
	3.27	banded female (PM-Y/LG) and UB male N ¹ B in <i>Artemisia</i>	DRB
	3.30	banded female (PM-Y/LG) with UB male	RAE
	5.11	banded female (PM-Y/LG) and UB male with fledglings	DRB
	5.14	banded female (PM-Y/LG) and UB male with fledglings	DRB
	5.15	banded female (PM-Y/LG) and male (banded: Y-MLG/Y, 1998-8) with three fledglings; young banded: LG-MLG/Y, 1998-5; DB-MW/R, 1998-6; and W/R-MW, 1998-7	DRB
	5.22	banded pair (female PM-Y/LG; male Y-MW/R) with three fledglings (LG-W/RM, DB-W/RM, W/R-RM)	DRB
	7.3	banded male (Y-MW/R) present in adjacent mulefat/elderberry; <i>Encelia</i> fading	DRB
	7.4	banded male (Y-MW/R) present "with" an UB bird (female/juvenile) in css	DRB
	7.7	banded pair (male Y-MW/R, female PM-Y/LG) present in css and mulefat/elderberry	DRB
	10.28	none found	RAE
	11.30	banded male (M-RW/R, 1998-B; from UCI3/8) 'paired' with UB female	RAE
BNCY20		[habitat eliminated by New Ford Road construction; not used since 1994; habitat was 7.3/2.8]	
BNCY21		[perhaps never a territory; family groups seen in 1994 & 1995 may have come from elsewhere (e.g., BNCY25); habitat was 2.7/2.3.9]	
BNCY22		[habitat eliminated by SJHTC construction; not used since 1994; habitat was 2.7]	
BNCY23		[partially cleared/graded in Jan/Feb 1997, upper three-fourths of remaining habitat cleared in July 1998; habitat 2.3.1]	
	1.4	not found	RAE
	3.31	male (BM-W, 1997-1) with female (BM-Y/LG, 1997-23; fledged at BNCY6 in 1997) at N ¹ /4EE in <i>Encelia</i>	DRB
	4.27	banded male (BM-W) incubating at N ¹ in <i>Encelia</i>	MM
	5.4	banded male (BM-W) incubating at N ¹ in <i>Encelia</i>	MM
	5.11	banded pair (male BM-W; female BM-Y/LG) present	DRB

5.12	banded pair (male BM-W ; female BM-Y/LG) at N ² /4EE in <i>Artemisia</i>	DRB
5.17	banded pair (male BM-W ; female BM-Y/LG) at N ² /4EE in <i>Artemisia</i>	DRB
5.20	N ² failed; banded pair (male BM-W ; female BM-Y/LG) N ³ B in <i>Encelia</i>	DRB
6.5	one incubating at N ⁴ in <i>Artemisia</i>	MM
6.12	pair incubating at N ⁴ in <i>Artemisia</i>	MM
6.19	pair tending fledglings	MM
6.27	banded pair (male BM-W ; female BM-Y/LG) with four fledglings	MM
6.30	banded pair (male BM-W ; female BM-Y/LG) with four fledglings	MM
7.6	banded pair (male BM-W ; female BM-Y/LG) with three fledglings (banded: OM-P, 1998-36; WM-P, 1998-37; LGM-O, 1998-38) in mulefat, along the creek, and coastal sage scrub on SJHTC slopes	DRB
7.17	pair (male BM-W ; female BM-Y/LG) with fledglings in revegetation area between BNCY7 and BNCY23	MM
7.25	pair (male BM-W ; female BM-Y/LG) with fledglings in mulefat and revegetation area between BNCY7 and BNCY23; core of territory now cleared	MM
10.29	none found	RAE
BNCY24	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1/4.6]	
BNCY25	[habitat 2.7/7.3/2.3.13]	
1.4	banded female (Y/LGM-DG, 1997-3 ; born at BNCY23 in 1997) "paired" with UB male	RAE
3.15	banded female (Y/LGM-DG) "paired" with UB male	RAE
3.29	banded female (Y/LGM-DG) and UB male at N ¹ /4EE in <i>Atriplex</i>	DRB
5.16	UB male with three juveniles	DRB
5.20	UB male with juvenile(s)	DRB
5.22	male (banded: LB-MW/R, 1998-20) with two juveniles (banded: DB-MY/LG, 1998-21 and P-MW/R, 1998-22); female now apparently absent	DRB
7.8	banded male (LB-MW/R) with UB female (=new mate); no action	DRB
10.22	banded male (LB-MW/R) with UB female	RAE
BNCY26	[habitat 2.3.1/7.3, some of it revegetated]	
1.4	one heard only	RAE
1.27	banded pair present (female BM-W/R, 1997-60 ; male MW-Y, 1996-3)	RAE
2.27	banded pair present (female BM-W/R ; male MW-Y), first in 26N, then 26S	RAE
3.30	banded pair (female BM-W/R ; male MW-Y) N ¹ B in <i>Artemisia</i>	DRB
5.12	banded pair (female BM-W/R ; male MW-Y) with fledglings	DRB
5.14	banded pair (female BM-W/R ; male MW-Y) with four fledglings; young banded: LG/Y-PM, 1998-1; LG/Y-OM, 1998-2; W-MLG/Y, 1998-3; and LG/Y-RM, 1998-4	DRB
7.3	banded pair (female BM-W/R ; male MW-Y) carrying food to unseen young/nest	DRB
7.5	banded pair (female BM-W/R ; male MW-Y) tending N ² /4YY in <i>Encelia</i>	DRB
7.9	banded pair (female BM-W/R ; male MW-Y) tending four fledglings (two banded: LGM-LG, 1998-42; OM-LB, 1998-43); UB juvenile of unknown origin also present (banded: MP-Y, 1998-44)	DRB
7.26	banded male (MW-Y) tending 3-4 juveniles (one banded: OM-LB ; two UB)	RAE
8.29	banded pair (female BM-W/R ; male MW-Y) loosely associating with two juveniles (MDG-W, 1998-29 , from BNCY18, and one UB) at BNCY18 interface	RAE
9.29	banded pair (female BM-W/R ; male MW-Y) on church lot, then in BNCY26; dispersed juvenile female at BNCY11	RAE
10.28	banded female (LB-MDB) and UB male (from BNCY18) in core of territory	RAE
BNCY27	[most of territory cleared/graded in Jan/Feb 1997, more cleared in March and May 1997; habitat was 2.3.6/4.6]	
1.4,3.29	none found	RAE,DRB
	rest of season incorporated in BNCY17	
BNCY28	[most of territory cleared/graded in Jan/Feb 1997, remainder cleared in March 1997; habitat was 2.8/4.6]	
BNCY29	[most of territory cleared/graded in Jan/Feb 1997; remainder in March 1997; habitat was 2.3.7]	
BNCY30	[mostly cleared/graded in Jan/Feb 1997, more cleared in May 1997, gully occupied in 1997 graded between Oct. 97 & Jan. 98; habitat was 2.3.1, then 2.8 (deerweed)/4.6; now gone]	
1.4.3.15,3.31,5.20	none found	RAE,DRB
10.22	UB pair present (and apparently settled) in ruderal vegetation, especially <i>Hirschfeldia</i>	RAE
BNCY31	[habitat 2.3.6/2.3.1, all of it revegetated]	
1.4	none found	RAE
2.27	male (OM-LG/Y, 1997-82) foraging with UB female	RAE
3.30	banded male (OM-LG/Y) and UB female N ¹ B in <i>Eriogonum</i>	DRB
5.13	banded male (OM-LG/Y) and UB female with fledglings	DRB

5.17	banded male (OM-LG/Y) and UB female with two fledglings (one banded: W-MW/R, 1998-15)	DRB
5.18	banded male (OM-LG/Y) and female (banded: O-MDB, 1998-16) with two fledglings (one banded: LG/Y-YM, 1998-17; plus W-MW/R)	DRB
7.5	banded pair (male OM-LG/Y; female O-MDB) tending N ² /2YY1E in <i>Artemisia</i>	DRB
7.9	banded pair (male OM-LG/Y; female O-MDB) present, N ² failed	DRB
10.30	none found; young female (LG/Y-YM) found southeast of BNCY-B; two pairs (UB male, UK female; UK male, UB female) south of BNCY31	RAE
BNCY-A	[habitat 2.3.1]	
BNCY-B	[most of territory cleared in Jan/Feb 1997; habitat was 2.3.6/2.3.10, habitat is 2.8.1/4.6]	
4.1	none found	DRB
10.30	UB pair present; also banded female (LG/Y-YM, 1998-17; from BNCY31) with UB male in ruderal vegetation SE of BNCY-B	RAE
BNCY-C	[habitat 4.1(<i>Brassica</i>)/4.6]	
BNCY-D	[habitat 4.6]	
BNCY-E	[habitat 2.3.10 (<i>Artemisia/Eriogonum/Baccharis pilularis</i>)]	
3.30	pair (male UB) present	DRB
5.29	pair (male UB; female RM-W/R, 1997-74, = BNCY31 in 1997) N ¹ B in <i>Artemisia</i> and with 2+ juveniles	DRB
7.7	pair (male UB; female RM-W/R) present; no action	DRB
BNCY-F	[not included in banding totals discussed in text; habitat 2.3.10 (<i>Artemisia/Eriogonum</i> etc.)]	
5.30	four local juveniles (siblings?) banded (M-LG/YR/W, M-Y/LGR/W, OM-DB, MP-DG)	DRB

APPENDIX D

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 1999

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 1999¹

		Observer(s)
BNCY1	[bisected by Bonita Canyon Road - now limited to the south side; merged with BNCY31 in 1999; part of the site cleared for storm drain construction in October 1999; habitat ² 2.3.1/2.3.6/2.8, a portion revegetated]	
1.3	none found	RAE
1.14	banded female (O-MDB, 1998-16; from BNCY31) with UB male	RAE
2.25	heard only	RAE
3.3	banded female (O-MDB) with UB male in northern BNCY31 and BNCY1	DRB
3.4	banded female (O-MDB) with UB male in northern BNCY31 and BNCY1	DRB
4.8	banded female (O-MDB) with UB male in BNCY31	DRB
4.25	two UB males battling (BNCY31 male plus a "floater"?)	DRB
4.26	UB male present (who?)	DRB
May-July	none found, but see BNCY31	DRB
9.20	banded pair (female O-MDB; male RY-M, 1999-38; from BNCY31) in BNCY1W	RAE
BNCY2	[habitat 2.4/2.3.1, a small portion revegetated]	
1.3	two "pairs" present in lower BNCY2: the 1998 pair (male M-W/RLG, 1997-79, female YM-DB, 1996-28) and a banded male (W/R-MY/LG, 1998-D; nestling at UCI in 1998) with UB female	RAE
1.14	banded female (MP-W, 1998-30; born at BNCY18 in 1998) "alone" in lower BNCY2; others heard only	RAE
3.1	banded pair (male M-W/RLG, female YM-DB) present, plus UB female (chased into mulefat below)	DRB
4.8	banded pair (male M-W/RLG, female YM-DB) present	DRB
4.24	banded pair (male M-W/RLG, female YM-DB) with N ¹ /3EE in <i>Artemisia</i>	DRB
4.28	banded female (YM-DB) on N ¹ /3EE in <i>Artemisia</i>	DRB, MCM
5.14	N ¹ /3YY in <i>Artemisia</i>	MCM
5.16	three nestlings banded (M-R/WY/LG, 1999-4; M-R/WW/R, 1999-5; MLG/Y-LB, 1999-6)	MCM
5.25	banded pair (M-W/RLG and YM-DB) tending 2-3 young (including M-R/WW/R and MLG/Y-LB); UB male also present at BNCY2/11	RAE
6.6	banded pair (M-W/RLG and YM-DB) with 3 young (M-R/WY/LG, M-R/WW/R and MLG/Y-LB)	DRB
6.10	banded pair (M-W/RLG and YM-DB) with 3 young (M-R/WY/LG, M-R/WW/R and MLG/Y-LB)	DRB
7.8	banded young (MY/LG-LG/Y, 1999-13; from BNCY19) at top of territory	DRB
7.9	dispersed juvenile (M-R/WW/R) at BNCY26	DRB
7.11	banded pair (M-W/RLG and YM-DB) present - no action;	
	banded young (MO-P, 1999-C; from UCI6) at top of territory	DRB
7.15	banded pair (M-W/RLG and YM-DB) chasing UB juvenile; no action	DRB
7.17	dispersed juvenile (M-R/WW/R) at BNCY26	DRB
7.27	"dispersed" juvenile (PM-P, 1999-31, from BNCY18N) in lower BNCY2;	
	banded juvenile (MO-P) with banded male (M-W/RLG?) in upper BNCY2/11	RAE
9.19	banded pair (M-W/RLG and YM-DB) in lower BNCY2 and at the BNCY2/11 boundary	RAE
11.6	banded pair (male M-W/RLG, female YM-DB) in lower BNCY2; banded male (W/R-MY/LG, 1998-D) with banded female (MW/R-R, 1997-70) in lower BNCY2 and adjacent mulefat	RAE
12.3	banded pair (male W/R-MY/LG; female MW/R-R) in lower BNCY2	RAE
BNCY3	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1; remainder of habitat cleared in July 1998]	
1.3	none found	RAE
7.15	banded juvenile (WM-O, 1999-16; from BNCY7) present	DRB
9.19	banded male (combination?) here and in the mulefat below	RAE
BNCY4	[W portion of BNCY5 from 1994-1997; juveniles observed in June 1994 may have come from elsewhere; habitat 2.3.10(<i>Encelia/Eriogonum/Opuntia</i>)]	
1.3	banded male (LBP-M, 1996-2; as in 1997/98) "alone;" none found on SJHTC slopes to the west	RAE
3.2	pair (male LBP-M; female DBM-Y/LG, 1997-22, as in 1998) present, plus UB "pair" at west end (=BNCY34)	DRB
4.8-12	banded pair (male LBP-M; female DBM-Y/LG) N ¹ B in <i>Artemisia</i>	DRB

1 Band colors: B, black; DB, dark blue; DG, dark green; LB, light blue; LG, light green; M, metal (USFWS); O, orange; P, purple; R, red; W, white; Y, yellow; R/W, red over white split-color band, etc.

2 Habitat designations follow Gray and Bramlet (1992): 2.3.6 (Sagebrush Scrub), 2.3.7 (Buckwheat Scrub), 2.3.10 (Mixed Sage Scrub), 2.3.12 (Sagebrush-Coyote Bush Sage Scrub), 2.7 (Chenopod Scrub), 2.8.1 (Sagebrush-Grassland), 2.8.2 (Buckwheat-Grassland), 2.8.5 (Mixed Sage Scrub-Grassland), 4.1 (Annual Grassland), 4.6 (Ruderal), 7.3 (Mulefat Scrub)

4.25	banded pair (male LBP-M; female DBM-Y/LG) with N ¹ /2EE in <i>Artemisia</i>	DRB
4.28	banded female (DBM-Y/LG) on N ¹ /2EE in <i>Artemisia</i>	DRB,MCM
5.14	banded pair (male LBP-M; female DBM-Y/LG) present; N ¹ disassembled	MCM
5.19	banded male (LBP-M) present	RAE
6.5	banded pair (male LBP-M; female DBM-Y/LG) N ² B in <i>Artemisia</i>	DRB
6.10	banded pair (male LBP-M; female DBM-Y/LG) at N ² /3EE in <i>Artemisia</i>	DRB
7.7	banded pair (male LBP-M; female DBM-Y/LG) present; N ² failed	DRB
7.7	banded pair (male LBP-M; female DBM-Y/LG) present; no action	DRB
7.10	banded pair (male LBP-M; female DBM-Y/LG) present; no action	DRB
7.15	banded pair (male LBP-M; female DBM-Y/LG) present; no action	DRB
9.19	banded pair (male LBP-M; female DBM-Y/LG) present here and in the reveg. above; also see BNCY7	RAE
BNCY5	[included BNCY4 in 1996 and 1997; habitat 2.3.1/4.6, most of it revegetated; entire territory eliminated in August/September 1999]	
1.3	UB male with UK female	RAE
2.25	banded female (MW/R-R, 1997-70, as in 1998) and UB male in adjacent mulefat and elderberry	RAE
3.6	banded female (MW/R-R) and UB male present	DRB
4.8-12	banded female (MW/R-R) and UB male present; also an UK gnatcatcher on 4.12	DRB
4.25	female (MW/R-R) now with male (M-LG/YLB, 1998-28; banded as young at BNCY15 in 1998)	DRB
6.5	banded female (MW/R-R) with an UB male again - no action	DRB
6.10	not found	DRB
6.13	UB male (and banded female?) primarily in riparian vegetation and <i>Conium</i> - no action	DRB
7.15	banded female (MW/R-R) and UB male present, mostly in mulefat and <i>Conium</i> , also in lower BNCY3; no action	DRB
9.19	banded female (MW/R-R) in mulefat/ <i>Sambucus/Conium</i> between BNCY5 and BNCY3; later in lower BNCY2	RAE
11.6	female (MW/R-R) with male (M-W/RLG, 1997-79) in lower BNCY2 and adjacent mulefat	RAE
BNCY6	[habitat 2.3.1/2.8, much of it revegetated]	
1.3	banded male (Y-MW/R, 1999-A; banded at Sand Canyon Reservoir in 1998) with UB female at east end; no sign of the 1998 pair	RAE
3.2	pair (female WM-Y/LG, 1997-24, as in 1998; male Y-MW/R) at west end, UB female at east end	DRB
4.12	banded pair (female WM-Y/LG; male Y-MW/R) with N ¹ /4EE in <i>Artemisia</i>	DRB
4.24	banded pair (female WM-Y/LG; male Y-MW/R) with N ¹ /3YY1E in <i>Artemisia</i>	DRB
4.27	banded pair (female WM-Y/LG; male Y-MW/R) with N ¹ /3YY1E in <i>Artemisia</i> ; young banded: OM-R, 1999-1; LGM-DG, 1999-2; DBM-LB, 1999-3	DRB
5.19	banded pair (female WM-Y/LG; male Y-MW/R) with 2-3 fledglings (including OM-R and DBM-LB) in dense coyote bush nursery	RAE
6.6	banded male (Y-MW/R) present; also banded female (UNK, metal on right leg)	DRB
6.10	one bird (UNK female?) present	DRB
6.13	banded male (Y-MW/R) and UK female at N ² /3EE in <i>Artemisia</i>	DRB
7.7	banded pair (female WM-Y/LG; male Y-MW/R) with 4 UB fledglings	DRB
7.15	banded pair (female WM-Y/LG; male Y-MW/R) with 4 fledglings (3 banded: M-DBY, 1999-40; LGP-M, 1999-41; RW-M, 1999-42)	DRB
9.20	none found	RAE
BNCY7	[most of territory cleared/graded in Jan/Feb 1997, more impacted in June 1997 and July 1998, habitat 2.3.1; remainder of BNCY9 incorporated here in 1998]	
1.3	none found	RAE
3.4	banded male (M-BB, 1996-29, as in 1998) with UB female	DRB
4.13	banded male (M-BB) with UB female; no birds found on the revegetated slopes to the west, although the scrub is nearly ready	DRB
4.24	banded male (M-BB) and UB female with N ¹ /3EE in <i>Artemisia</i>	DRB
4.28	UB female on N ¹ /3EE in <i>Artemisia</i>	DRB,MCM
5.14	banded male (M-BB) and UB female copulating; N ¹ disassembled	MCM
6.6	banded male (M-BB) and UB female at N ² /2YY in <i>Artemisia</i>	DRB
6.9	male (M-BB) and UB female at N ² /2YY (banded: YM-LG, 1999-15; WM-O, 1999-16) in <i>Artemisia</i>	DRB
6.12	banded male (M-BB) and UB female at N ² /2YY (YM-LG, WM-O) in <i>Artemisia</i>	DRB
6.17	banded male (M-BB) and UB female with 2 fledglings (YM-LG, WM-O)	DRB
6.24	banded male (M-BB) and UB female with 2 fledglings (YM-LG, WM-O) in mulefat below	RAE
7.8	banded male (M-BB) and UB female with one juvenile (YM-LG)	DRB

7.15	banded male (M-BB) and UB female present; dispersed juvenile (WM-O) at BNCY3	DRB
9.19	5-6 birds in lower BNCY7 and the "no-man's-land" between BNCY7 and BNCY4: 2-3 UB females, one UB male, banded male (M-R/WY/LG, 1999-4; born at BNCY2 in 1999), banded male (M-RO, 1999-E; born at Crystal Cove, CCB9, in 1999)	RAE
BNCY8	[cleared/graded in Jan/Feb 1997; habitat was 2.3.1]	
BNCY9	[most of territory cleared in Jan/Feb 1997; upper 75% of remaining habitat cleared in July 1998; remaining habitat merged with BNCY7 in 1998; habitat was 2.3.1]	
Jan. - Apr.	none found	RAE,DRB
BNCY10	[cleared/graded in Jan/Feb 1997; habitat was 2.3.1]	
BNCY11	[partially cleared/graded in Jan/Feb 1997; habitat 2.3.10(<i>Artemisia/Toxocodendron/Mimulus/ Eriogonum</i>), some of it revegetated]	
1.3	banded male (MDB-Y, 1998-47; banded at BNCY17 in 1998) with UK female	RAE
1.14	banded pair (male MDB-Y; female MP-Y, 1998-44, banded at BNCY26 in 1998) present	RAE
3.1	banded pair (male MDB-Y; female MP-Y) present	DRB
4.8	banded pair (male MDB-Y; female MP-Y) N ¹ B in <i>Artemisia</i>	DRB
4.12	banded pair (male MDB-Y; female MP-Y) present, N ¹ now gone	DRB
4.14	banded pair (male MDB-Y; female MP-Y) N ² B in <i>Artemisia</i>	DRB
4.24	banded pair (male MDB-Y; female MP-Y) present near N ² in <i>Artemisia</i>	DRB
5.14	N ² /3YY in <i>Artemisia</i>	MCM
5.16	N ² /3YY in <i>Artemisia</i>	MCM
5.17	three nestlings banded (MLB-P, 1999-8; MR/W-LG/Y, 1999-9; W/R-OM, 1999-10)	MCM
5.19	banded pair (male MDB-Y; female MP-Y) at N ² /3YY in <i>Artemisia</i>	RAE
5.25	banded female (MP-Y) tending banded fledgling (MLB-P); UB male also present at BNCY2/11; banded male and other young not found	RAE
6.6	banded female (MP-Y) and UB (new, see 5.25) male N ³ B in <i>Encelia</i>	DRB
6.10	banded female (MP-Y) and UB male at N ³ /4EE in <i>Encelia</i>	DRB
7.7	banded female (MP-Y) and UB male present; N ³ abandoned (EE still present)	DRB
7.15	banded female (MP-Y) and UB male present; no action	DRB
9.19	banded female (MP-Y) and UB male present	RAE
11.6	banded female (MP-Y) alone?	RAE
BNCY12	[most of territory cleared/graded in Jan/Feb 1997, more cleared in June/July 1997; habitat was 2.4/2.8/4.6; habitat is 4.6(<i>Brassica</i>)/2.3.6(trace); merged with BNCY17 in 1999]	
Jan. - Apr.	none found	RAE,DRB
6.8	pair (male MW-LB, 1998-45; female YM-R, 1998-46) from BNCY17 relocated here: N ³ B in <i>Artemisia</i>	DRB
7.11	N ³ failed, birds back at BNCY17	DRB
BNCY13	[habitat 2.3.1/4.6(<i>Brassica</i>)]	
1.3	banded male (MDB-DB, 1998-35; banded at BNCY6 in 1998) with UB female	RAE
3.7	banded male (MDB-DB) with UB female	DRB
3.8	banded male (MDB-DB) with UB female	DRB
4.20	banded male (MDB-DB) with UB female; observed copulating	DRB
6.7	banded male (MDB-DB) and UB female at N ¹ /4EE in <i>Artemisia</i>	DRB
6.10	banded male (MDB-DB) and UB female at N ¹ /1Y,2EE in <i>Artemisia</i>	DRB
6.17	banded male (MDB-DB) and UB female at N ¹ /2EE,1Y (banded: OM-W, 1999-33) in <i>Artemisia</i>	DRB
6.24	banded male (MDB-DB) ranging widely; female and fledgling not found	RAE
6.25	banded male (MDB-DB) and UB female foraging together; N ¹ apparently failed	RAE
7.11	pair (male: MDB-DB; female UB) present; N ¹ now has 2EE on a new lining over the two old EE (=N ²)	DRB
7.16	pair (male: MDB-DB; female UB) present - no action; N ² disturbed (1 old and 1 new E now gone)	DRB
9.21	none found	RAE
BNCY14	[habitat 7.3/2.3.1/4.6; heavy sedimentation December 1997- February 1998; considerable clearing in Oct. 1998; remainder cleared in Jan./Feb. 1999 -resprouted - then graded in August 1999]	
1.3	none found	RAE
5.6	UB pair at N ¹ /4EE in mulefat sprout	RAE
5.19	UB pair at N ¹ /4YY in mulefat sprout	RAE
5.23	UB pair at N ¹ /4YY in mulefat sprout	MCM
5.25	UB pair at N ¹ /4YY in mulefat sprout	RAE
6.7	UB pair tending 3 fledglings in lower BNCY-B	DRB
6.10	not found	DRB

6.14	pair (male banded: RM-R, 1999-26) tending three young (banded: DGM-O, 1999-23; PM-Y, 1999-24; YM-W, 1999-25) in lower BNCY-B	DRB
7.7	banded juvenile (DGM-O) still in lower BNCY-B; others not found	DRB
7.8	no birds found in extensive search of this and surrounding areas	DRB
8.6	dispersed juvenile (PM-Y) on the Coyote Canyon landfill (CCL9/10)	A. Wolf
BNCY15	[broad strip along MacArthur cleared in late summer 1997; habitat 2.3.9/2.7/7.3]	
1.3	banded male (DBLB-M, 1997-78 ; as in 1998) with UB female	RAE
3.7	banded male (DBLB-M) with UB female	DRB
4.26	banded male (DBLB-M) and UB female at N ¹ /4YY in <i>Baccharis pilularis</i>	DRB
4.28	banded male (DBLB-M) and UB female with four just-fledged YY	DRB,MCM
6.8	banded male (DBLB-M) and UB female at N ² /4EE in <i>Artemisia</i>	DRB
6.11	N ² /4EE in <i>Artemisia</i>	DRB
6.15	UB female at N ² /4EE in <i>Artemisia</i>	DRB
7.9	heard only	DRB
7.13	banded male (DBLB-M) and UB female present - no action; N ² failed	DRB
9.24	none found	RAE
BNCY16	[broad strip along MacArthur cleared in late summer 1997; southern tip of remainder cleared in 1999; habitat 2.3.10/2.3.9/2.7]	
1.3	banded pair (as in 1998: male BM-DB, 1997-6 , female O-YM, 1996-10) present	RAE
3.7	banded pair (male BM-DB , female O-YM) present	DRB
4.14	banded pair (male BM-DB , female O-YM) N ¹ B in <i>Atriplex</i>	DRB
4.26	banded pair (male BM-DB , female O-YM) at N ¹ /3EE in <i>Atriplex</i>	DRB
4.28	banded pair (male BM-DB , female O-YM) at N ¹ /3EE in <i>Atriplex</i>	DRB,MCM
5.14	N ¹ /3YY in <i>Atriplex</i>	MCM
5.16	three fledglings observed, one banded (MLG/Y-LG/Y, 1999-7)	MCM
6.8	banded pair (male BM-DB , female O-YM) with 3 juveniles (including MLG/Y-LG/Y)	DRB
7.9	banded pair (male BM-DB , female O-YM) present; no action dispersed juvenile (MLG/Y-LG/Y) at BNCY26	DRB
7.13	banded pair (male BM-DB , female O-YM) present; no action	DRB
9.24	banded male (BM-DB) with UB female	RAE
BNCY17	[most of territory cleared/graded in Jan/Feb 1997, BNCY27 incorporated in 1998, approximately half of remainder lost in 1999; BNCY12 incorporated in 1999; habitat 2.3.6/4.6]	
1.3	pair (as in 1998: male MW-LB, 1998-45 , female YM-R, 1998-46) on ruderal slopes across the valley	RAE
3.6	banded pair (female YM-R ; male presumably MW-LB) present	DRB
4.24	banded pair (female YM-R ; male MW-LB) at N ¹ /4EE in <i>Artemisia</i>	DRB
5.14	banded pair (female YM-R ; male MW-LB) N ² B in <i>Artemisia</i> ; N ¹ failed	MCM
6.8	N ² failed; banded pair (female YM-R ; male MW-LB) moved to BNCY12 (N ³ B)	DRB
7.11	banded pair (female YM-R ; male MW-LB) in the ditch; male chased UK juvenile	DRB
7.17	banded pair (female YM-R ; male MW-LB) in the ditch; no action	DRB
9.24	none found	RAE
BNCY18	[habitat 2.3.1/2.4, much of it revegetated]	
1.3	none found, but the 1998 pair (female LB-MDB, 1997-43 , male UB) was at BNCY26	RAE
2.25	banded female (LB-MDB) with UB male	RAE
3.1	banded female (LB-MDB) and UB male NB in <i>Encelia</i> at far east end (=BNCY26)	DRB
BNCY18N("E")		
3.23	banded male (W/R-MY/LG, 1998-D) present on the south side of the dam	RAE
4.6	banded male (W/R-MY/LG ; nestling at UCI in 1998) with UB female	DRB
4.25	banded male (W/R-MY/LG) with UB female	DRB
4.27	banded male (W/R-MY/LG) with UB female	DRB
6.5	banded male (W/R-MY/LG) on N ¹ /3EE in <i>Artemisia</i>	DRB
6.6	banded male (W/R-MY/LG) and UB female present	DRB
6.9	banded male (W/R-MY/LG) and UB female at N ¹ /2YY,1E in <i>Artemisia</i>	DRB
6.16	banded male (W/R-MY/LG) and UB female at N ¹ /1E,2YY (banded: PM-P, 1998-31; WM-LB, 1998-32) in <i>Artemisia</i>	DRB
6.24	banded male (W/R-MY/LG) and UB female tending two fledglings (PM-P, WM-LB)	RAE
7.8	banded male (W/R-MY/LG) and UB female tending two juveniles (PM-P, WM-LB)	DRB
7.17	banded male (W/R-MY/LG) and UB female tending two juveniles (PM-P, WM-LB)	DRB
7.27	banded male (W/R-MY/LG) with banded female/juvenile (Y/LGM-P?) in upper BNCY2/18;	

	“dispersed” juvenile (PM-P) in lower BNCY2	RAE
9.19	banded male (W/R-MY/LG) with two UB females on the church fence at the BNCY2/18 border	RAE
9.20	banded male (W/R-MY/LG) alone at the BNCY18/26 border and onto the church property	RAE
10.24	banded male (W/R-MY/LG) and UB female in lower BNCY2	RAE
11.6	banded male (W/R-MY/LG) with banded female (MW/R-R, 1997-70) in lower BNCY2	RAE
BNCY18S(“W”)		
4.14	UB pair present	DRB
4.26	UB pair N ¹ B in a defoliated (tussock moth) <i>Eriogonum</i>	DRB
5.14	N ¹ failed	MCM
6.5	UB pair present	DRB
6.6	not found	DRB
6.24	UB pair tending 2+ UB young at the east end of BNCY26 assumed to be this pair (N location?); pair (LB-MDB, 1997-43 and UB male, from BNCY26) present, also at least one of their offspring (YDB-M, 1999-14)	RAE
8.31	UB adult male near the last BNCY26 N site	RAE
11.6	banded female (LB-MDB) with UK male on church lot S of BNCY18S	RAE
BNCY19		
	[perhaps not previously a territory; male seen occasionally in 1994, crossed to UCI; habitat with some revegetated habitat (2.3.6) along SJHTC]	
2.3.1	female (PM-Y/LG, 1997-20; as in 1998) with male (M-RW/R, 1998-B; banded at UCI in 1998)	RAE
1.3	banded pair (female PM-Y/LG; male M-RW/R) present	DRB
3.2	banded pair (female PM-Y/LG; male M-RW/R) present	DRB
4.8	banded pair (female PM-Y/LG; male M-RW/R) N ¹ B in <i>Artemisia</i>	DRB
4.12	N ¹ /2EE in <i>Artemisia</i>	DRB
4.24	banded pair (female PM-Y/LG; male M-RW/R) at N ¹ /3EE in <i>Artemisia</i>	DRB
4.25	banded male (M-RW/R) on N ¹ /3EE in <i>Artemisia</i>	DRB
4.28	banded male (M-RW/R) on N ¹ /3YY in <i>Artemisia</i>	MCM
5.14	N ¹ /3YY in <i>Artemisia</i>	MCM
5.16	N ¹ /3YY (banded: MDG-Y, 1999-11; MO-LG, 1999-12; MY/LG-LG/Y, 1999-13) in <i>Artemisia</i>	MCM
5.17	female with fledglings?	RAE
5.24	banded pair (female PM-Y/LG; male M-RW/R) with three young (MDG-Y, MO-LG, MY/LG-LG/Y)	DRB
6.5	pair with young observed in adjacent riparian woodland	A. Wolf
6.10	dispersed juvenile (MY/LG-LG/Y) at BNCY2	DRB
7.8	dispersed juvenile (MDG-Y) at BNCY26	DRB
7.9	banded juvenile (M-YO, 1999-D; from UCI4) observed	DRB
7.10	banded pair (female PM-Y/LG; male M-RW/R) present; no action	DRB
7.15	dispersed juvenile (MO-LG) on the Coyote Canyon landfill (CCL11)	DRB
7.18	none found	RAE
9.19	[habitat eliminated by New Ford Road construction; not used since 1994; habitat was 7.3/2.8]	
BNCY20		
9.20	UB male in willows at the little Ford Road bridge	RAE
10.24	UB male and UK bird in riparian mitigation site to the west	RAE
11.4	UB pair on the css slope adjacent to the riparian mitigation site	RAE
BNCY21		
	[perhaps never a territory; family groups seen in 1994 & 1995 may have come from elsewhere (e.g., BNCY25); habitat was 2.7/2.3.9]	
BNCY22		
	[habitat eliminated by SJHTC construction; not used since 1994; habitat was 2.7]	
BNCY23		
	[partially cleared/graded in Jan/Feb 1997, upper three-fourths of remaining habitat cleared in July 1998, considerable revegetation since; BNCY33 incorporated in 1999; habitat 2.3.1/2.3.6]	
1.3	one heard only	RAE
3.2	banded female (BM-Y/LG, 1997-23, as in 1998) with UB male in the creek, across the creek (BNCY33), and in BNCY23	DRB
3.4	banded female (BM-Y/LG) with UB male in the creek and across the creek (BNCY33)	DRB
4.13	banded female (BM-Y/LG) with UB male at N ¹ /EE or YY in <i>Artemisia</i>	DRB
4.24	female (M-W/R/Y/LG, 1999-B; from Sand Canyon Reservoir) and UB male present; N ¹ now empty	DRB
6.9	banded female (BM-Y/LG) and UB male at N ² /4YY in <i>Artemisia</i>	DRB
6.15	female (BM-Y/LG) and UB male at N ² /4YY (banded: WM-LG, 1999-27; RM-DG, 1999-28; LBM-P, 1999-29; DGM-W, 1999-30) in <i>Artemisia</i>	DRB
6.24	female (BM-Y/LG) and UB male tending 3+ fledglings	RAE
7.8	none found	DRB

7.12	banded female (BM-Y/LG) and UB male with one juvenile (RM-DG) in riparian and scrub	DRB
7.15	pair with two fledglings	A. Wolf
9.19	UB male present; banded female (BM-Y/LG) and UB male (same?) in BNCY33 with the BNCY32 pair	RAE
BNCY24	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1/4.6]	
BNCY25	[habitat 2.7/7.3/2.3.13]	
1.3	banded male (LB-MW/R , 1998-20; as in 1998) with UB female	RAE
3.6-7	banded male (LB-MW/R) with UB female	DRB
4.14	pair (presumably male LB-MW/R and UB female) present	DRB
4.26	pair (presumably male LB-MW/R and UB female) present	DRB
6.8	UB pair tending "three" fledglings	DRB
6.9	UB pair tending 2+ fledglings	A. Wolf
6.11	pair (banded: male RM-LB , 1999-22, female LGM-Y , 1999-17) tending four young (banded: DBM-LG , 1999-18; DGM-P , 1999-19; RM-W , 1999-20; WM-DB , 1999-21)	DRB
7.9	banded male (RM-LB) present	DRB
7.13	banded pair (male RM-LB , female LGM-Y) present; no action	DRB
9.24	none found	RAE
BNCY26	[eastern portion of BNCY18 incorporated in 1999; habitat 2.3.1, some of it revegetated]	
1.3	banded female (LB-MDB , 1997-43; at BNCY18 in 1998) with UB male; no sign of the 1998 pair	RAE
1.14	banded female (LB-MDB) with UB male; no sign of the 1998 pair	RAE
3.1	UK female present; banded female (LB-MDB) and UB male N ¹ B in <i>Encelia</i> at BNCY18/26	DRB
3.6	banded female (LB-MDB) and UB male present	DRB
3.23	UB male and UK female present	RAE
4.6	banded female (LB-MDB) and UB male present; N ¹ now gone	DRB
4.25-27	UB male present, female not observed	DRB
5.25	banded female (LB-MDB) and UB male tending 3+ juveniles	RAE
6.5	banded female (LB-MDB) and UB male tending 3 juveniles in BNCY18(S)	DRB
6.7	banded female (LB-MDB) and UB male tending 3 juveniles (one banded: YDB-M)	DRB
6.13	banded female (LB-MDB) and UB male now alone - no action	DRB
6.24	banded female (LB-MDB) and UB male now in BNCY18S, along with one juvenile (YDB-M);	RAE
7.8	banded female (LB-MDB) and UB male at N ³ /3EE in <i>Isocoma</i> near BNCY18	DRB
7.9	four banded juveniles (MLG/Y-LG/Y , 1999-7, from BNCY16; MO-P , 1999-C, from UCI6; M-R/WW/R , 1999-5, from BNCY2; MDG-Y , 1999-11 from BNCY19) present	DRB
7.15	banded female (LB-MDB) and UB male at N ³ /3YY in <i>Isocoma</i> near BNCY18S	DRB
7.17	banded female (LB-MDB) and UB male at N ³ /3YY in <i>Isocoma</i> near BNCY18S; two banded juveniles (MO-P ; M-R/WW/R) present	DRB
7.20	banded female (LB-MDB) and UB male at N ³ /3YY (banded: M-WO , 1999-43; M-LBP , 1999-45; M-OP , 1999-44, the latter a runt)	DRB
7.27	banded female (LB-MDB) and UB male tending three fledglings (M-WO , M-LBP , M-OP) near BNCY18S	RAE
8.31	UB adult male near the N ³ site (BNCY18S/26)	RAE
9.19	UB adult male (presumably this one) alone on the church lot just S of the N ³ site at BNCY18S	RAE
9.20	banded male (M-R/WW/R) alone; UB female alone; banded female (LB-MDB) at the BNCY18/26 border	RAE
10.24	banded female (MDG-Y) present	RAE
11.6	banded male (M-R/WW/R) with banded female (MDG-Y); banded female (LB-MDB) near BNCY18S	RAE
12.3	banded female (LB-MDB) with UB male here and on the church lot over toward BNCY18; banded female (MDG-Y) with UK male on the church lot adjacent	RAE
BNCY27	[most of territory cleared/graded in Jan/Feb 1997, more cleared in March and May 1997, merged with BNCY17 in 1998; habitat was 2.3.6/4.6]	
BNCY28	[most of territory cleared/graded in Jan/Feb 1997, remainder cleared in March 1997; habitat was 2.8/4.6]	
BNCY29	[most of territory cleared/graded in Jan/Feb 1997; remainder in March 1997; habitat was 2.3.7]	
BNCY30	[mostly cleared/graded in Jan/Feb 1997, more cleared in May 1997, gully occupied in 1997 graded between Oct. 97 & Jan. 98; habitat was 2.3.1, then 2.8(deerweed)/4.6; now 2.3.1/2.3.9(reveg)/4.6]	
1.3	UB "pair" present at the east end	RAE
3.4	UB pair in the adjacent riparian habitat	DRB
3.8	pair on revegetated slopes across the creek presumably these birds	A. Wolf
4.13	UB pair N ¹ B in <i>Artemisia</i>	DRB
4.24	UB pair in adjacent riparian vegetation; N ¹ now destroyed	DRB
6.9	UB pair on revegetated slopes above BNCY30	DRB

6.12	UB pair present in the riparian area and their own "core" scrub area - no action	DRB
7.8	none found	DRB
7.12	pair (banded: male RM-LG, 1999-35 , female OM-Y, 1999-34) present, no action	DRB
9.24	none found	RAE
BNCY31	[merged with BNCY1 in 1999; habitat 2.3.6/2.3.1, all of it revegetated]	
1.3	banded female (O-MDB; 1998-16 ; as in 1998) with UB male	RAE
1.14	banded female (O-MDB) with UB male at BNCY1	RAE
3.3	banded female (O-MDB) with UB male in northern BNCY31/BNCY1; lone UB female in northern BNCY31; banded male (OM-LG/Y; 1997-82 ; as in 1998) with UB female at south end	DRB
3.4	banded female (O-MDB) with UB male in northern BNCY31/BNCY1; banded male (OM-LG/Y) with UB female in BNCY-E	DRB
4.8	banded female (O-MDB) with UB male in BNCY31	DRB
4.25	UB male present (presumably one of two battling UB males in BNCY1 earlier)	DRB
6.7	banded female (O-MDB) and UB male with one juvenile near BNCY-E	DRB
6.10	banded female (O-MDB) and UB male at N ² /1E in <i>Artemisia</i> ; male chasing juvenile	DRB
6.14	banded female (O-MDB) and UB male at N ² /4EE in <i>Artemisia</i>	DRB
7.7	banded female (O-MDB) and UB male at N ² /4YY in <i>Artemisia</i>	DRB
7.15	banded female (O-MDB) and male (banded: RY-M; 1999-38) tending 2 fledglings (one banded: M-WDB; 1999-39); remainder of N ² possibly predated	DRB
9.20	banded pair (female O-MDB ; male RY-M) in BNCY1W	RAE
9.21	banded pair (female O-MDB ; male RY-M) in BNCY31	RAE
BNCY32	[habitat 2.3.6, all of it revegetated]	
1.3	none found	RAE
3.2	banded pair (male apparently DB-MLG/Y, 1998-C , from Crystal Cove Bluffs; female apparently MDG-R, 1998-39 , from BNCY7) present	DRB
3.4	banded pair (male apparently DB-MLG/Y ; female apparently MDG-R) present	DRB
3.8	banded pair (male apparently DB-MLG/Y ; female apparently MDG-R) present	DRB
3.23	banded pair (male DB-MLG/Y ; female MDG-R) present; male battles UB male in creek bed	RAE
4.13	banded male (DB-MLG/Y) present	DRB
4.24-27	banded pair (male DB-MLG/Y ; female MDG-R) at N ¹ /4YY in <i>Artemisia</i>	DRB
5.10	banded pair (male DB-MLG/Y ; female MDG-R) with 2+ fledglings	A. Wolf
5.19	banded pair (male DB-MLG/Y ; female MDG-R) with 2 fledglings	RAE
6.9	banded pair (male DB-MLG/Y ; female MDG-R) present	DRB
6.12	pair (male DB-MLG/Y ; female MDG-R) present here and on the revegetated slopes across the creek	DRB
7.8	banded pair (male DB-MLG/Y ; female MDG-R) at N ² /2YY2EE in <i>Artemisia</i>	DRB
7.12	pair (male DB-MLG/Y ; female MDG-R) at N ² /1E2YY (banded: LBM-Y, 1999-36 ; PM-O, 1999-37)	DRB
7.19	banded pair (DB-MLG/Y and MDG-R) with two fledglings (LBM-Y, PM-O) in wetlands below	DRB
9.19	banded pair (DB-MLG/Y and MDG-R) in BNCY33	RAE
BNCY33	[merged with BNCY23 in 1999; habitat 2.3.6, all of it revegetated]	
3.2	banded female (BM-Y/LG, 1997-23 , from BNCY23) with UB male here, in the creek, and in BNCY23	DRB
3.4	banded female (BM-Y/LG) with UB male here and in the creek	DRB
3.23	banded female (apparently BM-Y/LG) with UB male in the creek below BNCY32; male battle	RAE
9.19	banded pair (DB-MLG/Y, 1998-C , and MDG-R, 1998-39 ; from BNCY32); banded female (BM-Y/LG) and UB male (from BNCY23); and UB female present	RAE
BNCY34	[habitat 2.3.6 (reveg)/2.4]	
1.3	none found	RAE
3.2	UB male and UB female present, not together	DRB
3.8	UB pair present	A. Wolf
4.12	UB pair present	A. Wolf, DRB
5.10	UB pair tending 2+ juveniles	A. Wolf
5.19	UB pair at N ² /3EE in <i>Artemisia</i> ; male battled 32 male on revegetated slopes and foraged on revegetated slopes and natural scrub at W edge of BNCY4; female foraged on revegetated slopes above BNCY4	RAE
6.9	UB pair foraging along the creek - no action	DRB
6.12	UB pair foraging in natural and restored scrub - no action	DRB
7.8	UB pair present, no action	DRB
9.19	none found	RAE

BNCY-A	[habitat 2.3.1]	
BNCY-B	[most of territory cleared in Jan/Feb 1997; habitat was 2.3.6/2.3.10, habitat is 2.8.1/4.6]	
BNCY-C	[habitat 4.1(<i>Brassica</i>)/4.6]	
4.28	banded female (M-W/R/Y/LG, 1999-B; from Sand Canyon Reservoir) and UB male present	DRB,MCM
5.19	none found	RAE
BNCY-D	[habitat 4.6]	
BNCY-E	[habitat 2.3.1]	
1.3	banded female (RM-W/R, 1997-74; as in 1998) with male (OM-LG/Y, 1997-82; at BNCY31 in 1998)	RAE
3.4	banded male (OM-LG/Y) and UB female present	DRB
4.8	banded male (OM-LG/Y) and UB female present	DRB
4.26	banded male (OM-LG/Y) and UB female present	DRB
7.16	banded male (OM-LG/Y) and UB female present, no action	DRB
9.21	banded male (OM-LG/Y) "with" UK bird	RAE
BNCY-F	[habitat 2.3.1]	
1.3	none found	RAE
7.16	UB pair present, no action	DRB
BNCY-G	[habitat 2.3.1]	
7.16	UB pair present, no action	DRB

APPENDIX E

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 2000

CHRONOLOGY OF CALIFORNIA GNATCATCHER ACTIVITY IN THE BONITA CANYON ROAD STUDY AREA, 2000¹

		Observer(s)
BNCY1	[bisected by Bonita Canyon Road - now limited to the south side; merged with BNCY31 in 1999 and 2000; part of the site cleared for storm drain construction in October 1999 - estimated by DRB as 15-20% of habitat; habitat ² 2.3.1/2.3.6, most of it revegetated]	
3.2	banded pair (female O-MDB, 1998-16; male RY-M, 1999-38; as last year) in BNCY1	DRB
4.6	none found	DRB
5.14	none found	DRB
5.29	banded pair from BNCY31 (female O-MDB; male RY-M) at N/4EE in <i>Artemisia</i>	RAE
6.11	N failed; banded pair (female O-MDB; male RY-M) at new N/4EE in <i>Artemisia</i>	DRB
6.17	banded pair (female O-MDB; male RY-M) at N/4EE in <i>Artemisia</i>	DRB
6.21	N failed; banded female (O-MDB) NB in BNCY31	DRB
7.17	UK bird in BNCY1N	RAE
8.1	banded pair (female O-MDB; male RY-M) foraging together in BNCY1	RAE
9.24	none found	DRB
BNCY2	[habitat 2.3.4/2.4/2.3.1, a small portion revegetated]	
2.22	banded male(W/R-MY/LG, 1998-D; from BNCY18N) alone in mulefat and scrub below BNCY2	RAE
3.1	none found	DRB
3.6	banded pair (male W/R-MY/LG; female YM-DB, 1996-28, as in 1999) in lower BNCY2	RAE
3.7	banded pair (male W/R-MY/LG, female YM-DB) present	DRB
4.4	banded pair (male W/R-MY/LG, female YM-DB) present	DRB
4.5	banded pair (male W/R-MY/LG, female YM-DB) present	DRB,JAS,TAM
4.13	banded pair (male W/R-MY/LG, female YM-DB) at N ¹ in <i>Salvia mellifera</i>	JAS,TAM
4.17	banded pair (male W/R-MY/LG, female YM-DB) at N ¹ in <i>Salvia mellifera</i>	DRB
4.24	N ¹ /4YY (4-6 days old) in <i>Salvia mellifera</i>	JAS,TAM
5.19	banded pair (W/R-MY/LG, female YM-DB) tending 3-4 fledglings	DRB
6.11	banded male (W/R-MY/LG) now with UB female	DRB
6.20	banded male (W/R-MY/LG) and UB female present	DRB
7.4	banded male (W/R-MY/LG) present	RAE
7.15	banded male (W/R-MY/LG) and UB female present, no sign of nesting	DRB
7.17	banded male (W/R-MY/LG) present	RAE
8.31	banded male (W/R-MY/LG) with UB female below BNCY2	RAE
9.24	banded male (W/R-MY/LG) and UB female present	DRB
11.3	banded male (W/R-MY/LG) and UB female present below BNCY2	RAE
BNCY3	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1; remainder of habitat cleared in July 1998]	
BNCY4	[W portion of BNCY5 from 1994-1997; juveniles observed in June 1994 may have come from elsewhere; habitat 2.4/2.3.6]	
3.1	banded male (LBP-M, 1996-2, as last year) at "BNCY5"	DRB
3.2	banded pair (male LBP-M; female UK) at BNCY4/34	DRB
3.7	banded pair (male LBP-M; female UK) at "BNCY5"	DRB
3.27	N ¹ /3EE in <i>Artemisia</i> apparently abandoned about this date	TAM
3.30-4.1	banded pair (male LBP-M; female DBM-Y/LG, 1997-22, as in 1999) N ² B in <i>Artemisia</i>	M. Couffer
4.5	N ² /4EE in <i>Artemisia</i>	JAS,TAM
4.17	N ² /4YY in <i>Artemisia</i>	DRB
4.27-28	banded male (LBP-M) at N ² /4YY	JAS
5.1	pair tending fledglings in <i>Atriplex</i> reveg. upslope	JAS
5.4	pair tending 4 fledglings	JAS
5.18	banded pair (male LBP-M; female DBM-Y/LG) tending 3+ fledglings	DRB

1 Band colors: B, black; DB, dark blue; DG, dark green; LB, light blue; LG, light green; LP, light pink; M, metal (USFWS); O, orange; P, purple; R, red; W, white; Y, yellow; R/W, red over white split-color band, etc.

2 Habitat designations follow Gray and Bramlet (1992): 2.3.6 (Sagebrush Scrub), 2.3.7 (Buckwheat Scrub), 2.3.10 (Mixed Sage Scrub), 2.3.12 (Sagebrush-Coyote Bush Sage Scrub), 2.7 (Chenopod Scrub), 2.8.1 (Sagebrush-Grassland), 2.8.2 (Buckwheat-Grassland), 2.8.5 (Mixed Sage Scrub-Grassland), 4.1 (Annual Grassland), 4.6 (Ruderal), 7.3 (Mulefat Scrub)

5.19	banded pair (male LBP-M ; female DBM-Y/LG) tending 3 fledglings (banded: M-LBR, 2000-9 ; M-WR, 2000-10 ; M-PY, 2000-11)	DRB
6.11	dispersing juvenile (M-WR) at BNCY7	DRB
6.12	banded male (LBP-M) foraging alone	DRB
6.21	none found	DRB
6.23	dispersing juvenile (M-PY) at BNCY18	RAE
6.25	banded female (DBM-Y/LG) alone?	DRB
7.4	banded pair (male LBP-M ; female DBM-Y/LG) present	RAE
7.15	banded pair (LBP-M, DBM-Y/LG) foraging together, no sign of nesting; UB juvenile also present	DRB
7.16	dispersing juvenile (M-PY) at BNCY26	DRB
9.23	none found	DRB
BNCY5	[included BNCY4 in 1996 and 1997; habitat was 2.3.1/4.6, most of it revegetated; entire territory eliminated in August/September 1999]	
BNCY6	[habitat 2.3.1, much of it revegetated]	
3.2	banded pair (as last year: female WM-Y/LG, 1997-24 ; male Y-MW/R, 1999-A) present	DRB
4.13	banded male Y-MW/R present	DRB
4.14	banded male Y-MW/R present	TAM,JAS
4.17	banded male Y-MW/R present	TAM,JAS
4.27	banded male Y-MW/R at N ¹ /2EE in <i>Artemisia</i>	TAM,JAS
5.12	N ¹ /2YY2EE in <i>Artemisia</i>	TAM,JAS
5.21	banded male (Y-MW/R) wide ranging	DRB
6.12	banded pair (female WM-Y/LG ; male Y-MW/R) tending 3+ juveniles in coyote brush	DRB
6.18	banded pair (female WM-Y/LG ; male Y-MW/R) present, status?	DRB
6.23	none found	DRB
7.4	banded male (Y-MW/R) alone(?) at far east end	RAE
7.16	banded male (Y-MW/R) apparently paired with banded juvenile (M-BDG, 2000-6 ; from BNCY23); UB juvenile also present	DRB
7.17	banded juvenile (M-BDG) present	RAE
9.24	pair of banded hatch-years (female M-BDG ; male DBM-DB, 2000-21 , banded at BNCY11) present	DRB
BNCY7	[new territory mostly on revegetated slopes, most of old territory cleared/graded in Jan/Feb 1997, more impacted in June 1997 and July 1998, habitat now 2.3.1/2.3.10; remainder of BNCY9 incorporated here in 1998]	
3.1	banded male (combination UK) and UB female crossed creek to BNCY34	DRB
3.7	banded male (combination UK) and UB female in BNCY7/34	DRB
4.5	banded male (M-LG/YLB, 1998-28 ; born at BNCY15 in 1998, seen at BNCY5 in 1999) with UB female in mulefat	DRB
4.17	none found	DRB
4.19	banded male (M-LG/YLB) and UB female N ¹ B (lining) in <i>Artemisia</i>	DRB
5.16	UK male on N ¹ in <i>Artemisia</i>	DRB
5.19	N ¹ failed; UK male and UB female present	DRB
6.11	banded male (M-LG/YLB) and UB female present, female possibly NB; also, 2 dispersing juveniles (M-WR, 2000-10 , from BNCY5; UB) present	DRB
6.12	banded male (M-LG/YLB) and UB female present, male includes BNCY35	DRB
6.19	banded male (M-LG/YLB) and UB female present, status?	DRB
6.20	banded male (M-LG/YLB) and UB female present, status?	DRB
6.21	pair not found in BNCY7/9/35	DRB
6.24	banded male (M-LG/YLB) and UB female present, status?	DRB
7.15	banded male (M-LG/YLB) and UB foraging together in mulefat, elderberry, and willow; M-R (formerly M-WR ?) also present	DRB
9.23	dispersed young male (MLB-DB, 2000-14 , born at BNCY19) present in landscaping	DRB
BNCY8	[cleared/graded in Jan/Feb 1997; habitat was 2.3.1]	
BNCY9	[most of territory cleared in Jan/Feb 1997; upper 75% of remaining habitat cleared in July 1998; remaining habitat merged with BNCY7 in 1998; habitat was 2.3.1]	
BNCY10	[cleared/graded in Jan/Feb 1997; habitat was 2.3.1]	
BNCY11	[partially cleared/graded in Jan/Feb 1997; habitat 2.3.10(<i>Artemisia/Toxocodendron/Mimulus/Eriogonum</i>), some of it revegetated]	
2.22	banded female (MP-Y, 1998-44 ; as in 1999) and UB male (as in 1999?) present	RAE
3.1	banded female (MP-Y) and UB male present	RAE
4.4	banded female (MP-Y) and UB male N ¹ B (lining) in <i>Isocoma</i>	DRB
4.5	banded female (MP-Y) and UB male near ready N ¹ in <i>Isocoma</i>	DRB

4.13	banded female (MP-Y) and UB male at N ¹ /4EE in <i>Isocoma</i>	DRB
4.18	N ¹ abandoned (probably storm related), birds not seen	DRB
5.19	banded female (MP-Y) and UB male at N ² /4EE in <i>Encelia</i>	DRB
6.11	banded female (MP-Y) and UB male tending 3-4 juveniles	DRB
6.15	banded female (MP-Y) and male (banded: M-LBLG, 2000-22) present; also, one juvenile (banded: DBM-DB, 2000-21 ; not necessarily born here) present	DRB
6.20	one bird on N ³ /4EE in <i>Artemisia</i>	DRB
6.23	N ³ /4EE in <i>Artemisia</i>	DRB
6.24	banded female (MP-Y) on N ³ /4EE in <i>Artemisia</i>	DRB
6.25	banded pair (female MP-Y , male M-LBLG) at N ³ /4EE in <i>Artemisia</i>	DRB
7.15	banded pair (female MP-Y , male M-LBLG) tending 2+ fledglings	DRB
7.19	banded pair (female MP-Y , male M-LBLG) going to roost in <i>Toxicodendron</i> (young?); banded juvenile (MLB-DB, 2000-14 , from BNCY19) also present	DRB
7.20	banded pair (female MP-Y , male M-LBLG) tending 1 young (banded: M-LBLB, 2000-32); 3 other juveniles present, two from BNCY19 (MLB-DB and MLB-O, 2000-13) and one unknown (banded: M-OR, 2000-33)	DRB
9.24	banded pair (female MP-Y , male M-LBLG) present	DRB
BNCY12	[most of territory cleared/graded in Jan/Feb 1997, more cleared in June/July 1997; habitat was 2.4/2.8/4.6; habitat is 4.6(<i>Brassica</i>)/2.3.6(trace); merged with BNCY17 in 1999]	
BNCY13	[habitat 2.3.1/4.6(<i>Brassica</i>)]	
3.28	banded male (MDB-DB, 1998-35 ; as in 1999) and UB female present	RAE
4.6	banded male (MDB-DB) and UB female at N ¹ /4EE in <i>Artemisia</i>	DRB
4.16	banded male (MDB-DB) and UB female at N ¹ /4YY in <i>Artemisia</i>	DRB
4.18	banded male (MDB-DB) and UB female at N ¹ /4YY in <i>Artemisia</i>	DRB
5.2	banded male (MDB-DB) and UB female tending 3-4 fledglings	RAE
5.21	banded male (MDB-DB) and UB female foraging together	DRB
6.13	banded male (MDB-DB) and UB female tending N ² /3YY1E in <i>Artemisia</i>	DRB
6.17	N ² failed; banded male (MDB-DB) and UB female present	DRB
7.16	banded male (MDB-DB) and UB female tending N ³ /2YY2EE in <i>Artemisia</i>	DRB
7.19	banded male (MDB-DB) and UB female tending N ³ /2YY2EE in <i>Artemisia</i>	DRB
7.20	male (MDB-DB) and UB female tending N ³ /2EE2YY (banded: MP-R, 2000-31 ; MLB-LG, 2000-30)	DRB
8.1	banded male (MDB-DB) and UB female tending 2 banded young (MP-R, MLB-LG); pair also chased UB juvenile	RAE
9.21	banded male (MDB-DB) and UK female present	DRB
9.22	dispersed young (MP-R) at UCI7N	DRB
BNCY14	[habitat 7.3/2.3.1/4.6; heavy sedimentation December 1997- February 1998; considerable clearing in Oct. 1998; remainder cleared in Jan./Feb. 1999 -resprouted - then graded for good beginning in August 1999]	
BNCY15	[broad strip along MacArthur cleared in late summer 1997; habitat 2.3.9/2.7/7.3; much of BNCY16 incorporated in 2000]	
3.6	banded male (BM-DB, 1997-6 ; at BNCY16 in 1999) and UK female present	DRB
4.16	banded male (BM-DB) and UB female at N ¹ /1E3YY(3-4 days old) in <i>Atriplex</i>	DRB
4.18	N ¹ abandoned (probably storm related); adults not seen	DRB
5.2	none found	RAE
6.13	banded male (BM-DB) and UB female tending 3-4 young	DRB
6.14	banded male (BM-DB) and female (banded: MO-O, 2000-19) tending 4 young (banded: MR-LB, 2000-16 ; MY-DG, 2000-17 ; RM-P, 2000-18 ; MLB-DG, 2000-20)	DRB
7.18	banded pair (male BM-DB , female MO-O) present, no indication of nesting	DRB
9.21	banded male (BM-DB) and UK female present	DRB
BNCY16	[broad strip along MacArthur cleared in late summer 1997; southern tip of remainder cleared in 1999; habitat 2.3.10/2.3.9/2.7; much of territory annexed by BNCY16 in 2000]	
3.6	none found	DRB
4.16	none found	DRB
5.2	none found	RAE
6.13	none found	DRB
9.21	none found	DRB
BNCY17	[most of territory cleared/graded in Jan/Feb 1997, BNCY27 incorporated in 1998, approximately half of remainder lost in 1999; BNCY12 incorporated in 1999; habitat 2.3.6/4.6]	
3.6	none found	DRB
3.28	none found	RAE

5.21	none found	DRB
7.16	UB adult male, apparently alone, in scrub, mustard, and willows	DRB
BNCY18	[habitat 2.3.1/2.4, much of it revegetated]	
2.22	UB pair (as in 1999?) present	RAE
3.6	banded female (LB-MDB, 1997-43; BNCY26 in 1999) with UB male at BNCY18/26	RAE
3.7	banded female (LB-MDB) with UB male at BNCY18/26	RAE
4.5	banded female (LB-MDB) and UB male present	TAM,JAS
4.6	banded female (LB-MDB) and UB male present	DRB
4.7	N ¹ in <i>Encelia</i>	TAM,JAS
4.8	N ¹ /4EE in <i>Encelia</i>	TAM,JAS
4.13	banded female (LB-MDB) and UB male at N ¹ /4EE in <i>Encelia</i>	DRB
4.16	banded female (LB-MDB) and UB male at N ¹ /4EE in <i>Encelia</i>	DRB
4.19	N ¹ /4YY abandoned (probably storm related); pair N ² B in <i>Salvia mellifera</i>	TAM,JAS,DRB
4.25	N ² in <i>Salvia</i> pulled apart	TAM,JAS
5.2	N ³ /4EE in <i>Encelia</i>	TAM,JAS
5.14	banded female (LB-MDB) and UB male tending N ³ /1E,3YY (0-1 day old) in <i>Encelia</i>	DRB
5.21	N ³ failed; banded female (LB-MDB) and UB male present	DRB,RAE
6.23	dispersing juvenile (M-PY, 2000-11; from BNCY4) present at BNCY18/26	RAE
6.11	banded female (LB-MDB) and UB male at N ⁴ /1Y2EE in <i>Artemisia</i>	DRB
6.17	banded female (LB-MDB) and UB male at N ⁴ /3YY in <i>Artemisia</i>	DRB
6.20	banded female (LB-MDB) and UB male at N ⁴ /3YY (banded: MP-O, 2000-23; DBM-O, 2000-24; M-YW, 2000-25)	DRB
6.25	banded female (LB-MDB) and UB male tending 3 banded fledglings (MP-O, DBM-O, M-YW)	DRB
7.16	banded female (LB-MDB) and UB male tending 3 banded young (MP-O, DBM-O, M-YW); banded juvenile (W/R-W/RM, 2000-12, from BNCY19) also present	DRB
7.17 2-3	UB juveniles at BNCY2/18; banded juveniles (MP-O, DBM-O) at BNCY18/2	RAE
7.20	UB male present	DRB
8.22-29	dispersed female (DBM-O) at Coyote Canyon landfill (CCL14)	DK
8.31	UB male present	RAE
9.24	banded female (LB-MDB) and UB male present	DRB
9.26	banded female (LB-MDB) and UB male present	RAE
11.22	banded female (LB-MDB) at BNCY18/26	RAE
BNCY19	[perhaps not previously a territory; male seen occasionally in 1994, crossed to UCI; habitat 2.3.1 with some revegetated habitat (2.3.6) along SJHTC; minor impact from spillway construction in August/September 1999]	
3.2	none seen	DRB
3.7	banded male (M-RW/R, 1998-B) with UK female	DRB
3.30	banded pair (female PM-Y/LG, 1997-20, male M-RW/R; as in 1999) N ¹ B	M.Couffer?
4.13	banded female (PM-Y/LG) and male (M-RW/R) in scrub and willows - no action	DRB
4.17	banded pair (female PM-Y/LG; male M-RW/R) at N ² /4EE in <i>Encelia</i>	TAM
4.19	N ² failed; banded pair (female PM-Y/LG; male M-RW/R) present	TAM
4.20	banded pair (female PM-Y/LG; male M-RW/R) N ³ B	TAM,JAS
4.25	N ³ /1E in <i>Artemisia</i>	TAM,JAS
5.2	N ³ /4EE in <i>Artemisia</i>	TAM,JAS
5.12	N ³ /4YY in <i>Artemisia</i>	TAM,JAS
5.18	N ³ /4YY in <i>Artemisia</i>	DRB
5.19	banded pair (female PM-Y/LG; male M-RW/R) at N ³ /4YY (banded: W/R-W/RM, 2000-12; MLB-O, 2000-13; MLB-DB, 2000-14; BM-P, 2000-15)	DRB
5.21	banded pair (female PM-Y/LG; male M-RW/R) tending N ³ /4YY in <i>Artemisia</i>	DRB
5.29	banded pair (female PM-Y/LG; male M-RW/R) tending 4 fledglings	RAE
6.4	banded pair (female PM-Y/LG; male M-RW/R) tending 4 fledglings	A. Wolf
6.12	banded pair (PM-Y/LG; M-RW/R) tending 3-4 banded young (W/R-W/RM, MLB-O, MLB-DB)	DRB
6.13	banded male (M-RW/R) with 1+ young (MLB-DB)	RAE
6.18	banded pair (PM-Y/LG; M-RW/R) tending 3-4 banded young (W/R-W/RM, MLB-O, MLB-DB)	DRB
6.21	banded pair (PM-Y/LG; M-RW/R) with juveniles	DRB
6.23	banded pair (PM-Y/LG; M-RW/R) with 3 juveniles	DRB
7.4	banded pair (female PM-Y/LG; male M-RW/R) in <i>Salix</i>	RAE
7.16	banded male (M-RW/R) and UK female present in willows and elderberry; dispersing juvenile (W/R-W/RM) at BNCY18/26	DRB

7.19	dispersing juvenile (MLB-DB) at BNCY11	DRB
7.20	dispersing juveniles (MLB-DB and MLB-O) at BNCY11	DRB
9.23	dispersed young male (MLB-DB) at BNCY7	DRB
9.24	banded pair (PM-Y/LG ; M-RW/R) in BNCY19 and BNCY6W, male chased UK California gnatcatcher through riparian woodland into BNCY6, the female followed	DRB
BNCY20	[habitat eliminated by New Ford Road construction; not used since 1994; habitat was 7.3/2.8]	
Feb-May	none found	RAE,DRB
6.23	BNCY26 family present here	RAE
6.25	none found	DRB
9.24	none found	DRB
BNCY21	[perhaps never a territory; family groups seen in 1994 & 1995 may have come from elsewhere (e.g., BNCY25); habitat was 2.7/2.3.9]	
BNCY22	[habitat eliminated by SJHTC construction; not used since 1994; habitat was 2.7]	
BNCY23	[partially cleared/graded in Jan/Feb 1997, upper three-fourths of remaining habitat cleared in July 1998, considerable revegetation since; BNCY33 incorporated in 1999 and 2000; habitat 2.3.1/2.3.6]	
3.1	banded female (BM-Y/LG , 1997-21 ; as in 1999) and UB male present	DRB
4.5	banded female (BM-Y/LG) and UB male at N ¹ /4EE in <i>Artemisia</i>	DRB
4.18	banded female (BM-Y/LG) and UB male at N ¹ /4YY(5-6 days old) in <i>Artemisia</i>	DRB
4.19	banded female (BM-Y/LG) and UB male at N ¹ /4YY(7-8 days old) in <i>Artemisia</i>	DRB
4.28	banded female (BM-Y/LG) and UB male tending 4 fledglings	RAE
5.18	banded female (BM-Y/LG) and UB male tending fledglings and NB? in BNNCY23/33	DRB
5.19	banded female (BM-Y/LG) and male (banded: YY-M , 2000-5) tending 4 juveniles (banded: MP-P , 2000-4 ; M-BDG , 2000-6 ; M-WLB , 2000-7 ; M-RW , 2000-8) in BNNCY23	DRB
6.4	banded bird (M-PY , 2000-11 ; from BNCY4) present	AW
6.11	dispersing juvenile (MP-P) at BNCY26	DRB
6.12	pair not found (in BNCY33?); dispersing juvenile (M-WR , 2000-10 ; from BNCY5) present	DRB
6.13	banded pair (female BM-Y/LG , male YY-M) at N ² /4EE in <i>Artemisia</i> ; male (YY-M) chases BNCY32 male and juveniles at BNCY32/33 border	DRB
6.19	banded pair (BM-Y/LG , YY-M) tending N ² /3YY1E in <i>Artemisia</i> in BNCY33; juvenile (M-WR) also present	DRB
6.25	banded pair (BM-Y/LG , YY-M) tending N ² /4YY in <i>Artemisia</i> in BNCY33	DRB
7.4	N ² failed; pair (BM-Y/LG , YY-M) foraging together (BNCY23/33) and mobbing roadrunner (BNCY23)	RAE
7.16-17	dispersing juvenile (M-BDG) at BNCY6	DRB,RAE
7.18	pair (BM-Y/LG , YY-M) foraging together, no sign of nesting	DRB
9.23	banded male (YY-M) with UB female; another UB male present also; dispersed juvenile (M-BDG) at BNCY6	DRB
BNCY24	[most of territory cleared/graded in Jan/Feb 1997; habitat was 2.3.1/4.6]	
BNCY25	[habitat 2.7/7.3]	
3.6	banded male (LB-MW/R , 1998-20 ; as in 1998 and early 1999) with UB female	DRB
3.28	UK male present	RAE
4.16	UB female at N ¹ /3YY in <i>Atriplex</i>	DRB
4.18	UK male at N ¹ /3YY(7-8 days old) in <i>Atriplex</i>	DRB
4.28	none found	RAE
5.2	none found	RAE
5.16	none found	DRB
5.19	none found	DRB
6.14	none found	DRB
6.23	banded male (RM-LB , 1999-22 ; from BNCY25E) and UB juvenile present	DRB
7.18	banded male (LB-MW/R) alone in core area; UB female and UB juvenile male at creek x MacArthur	DRB
9.21	banded male (RM-LB) with UB female, also an UB male present in <i>Atriplex</i> along MacArthur	DRB
BNCY26	[eastern portion of BNCY18 incorporated in 1999; habitat 2.3.1/7.3, some of it revegetated]	
2.22	banded female (MDG-Y , 1999-11 ; born at BNCY19 in 1999) alone at south end	RAE
3.2	banded female (MDG-Y) with UB male	DRB
3.6	banded female (LB-MDB , 1997-43 ; as in 1999) with UB male at BNCY18/26	RAE
3.7	banded female (LB-MDB ; as in 1999) with UB male in "BNCY18"	DRB
3.28	banded female (MDG-Y) with UK male present	RAE
4.13	banded female (MDG-Y) and UB male present	DRB
4.17	one heard only	DRB
4.19	banded female (MDG-Y) and UB male N ¹ B in <i>Encelia</i>	DRB
4.28	banded female (MDG-Y) and UB male present	RAE

5.14	N ¹ abandoned (never completed); none found	DRB
5.21	none found	DRB
5.29	UB male present, status?	RAE
6.11	UB male present (status?), also dispersing juvenile (MP-P, 2000-4, from BNCY23) and UB juvenile	DRB
6.21	2 juveniles present: M-PY, 2000-11 (from BNCY4) and UB	DRB
6.23	banded female (MDG-Y) and UB male tending 3-4 fledglings in BNCY20; male also seen in BNCY26; dispersing juvenile (M-PY) present at BNCY18/26	RAE
6.25	banded female (MDG-Y) and male (banded: M-RR, 2000-26) tending 3 young (banded: MLG-P, 2000-27; MR-DB, 2000-28; YO-M, 2000-29)	DRB
7.16	banded pair (MDG-Y and M-RR) tending 3 young (banded: MLG-P, MR-DB, YO-M); dispersing juvenile (M-PY, from BNCY4) also present	DRB
8.31	banded female (MDG-Y) present	RAE
9.24	UK pair present	DRB
9.26	banded female (MDG-Y) with banded UK	RAE
11.3	banded female (M-PY) apparently alone	RAE
11.22	banded male (M-RR) and UK female present	RAE
BNCY27	[most of territory cleared/graded in Jan/Feb 1997, more cleared in March and May 1997, merged with BNCY17 in 1998; habitat was 2.3.6/4.6]	
BNCY28	[most of territory cleared/graded in Jan/Feb 1997, remainder cleared in March 1997; habitat was 2.8/4.6]	
BNCY29	[most of territory cleared/graded in Jan/Feb 1997; remainder in March 1997; habitat was 2.3.7]	
BNCY30	[mostly cleared/graded in Jan/Feb 1997, more cleared in May 1997, gully occupied in 1997 graded between Oct. 97 & Jan. 98; habitat was 2.3.1, then 2.8(deerweed)/4.6; now 2.3.10(reveg)/4.6]	
3.1	none seen	DRB
4.5	banded pair - as in 1999 (male RM-LG, 1999-35, female OM-Y, 1999-34) - in riparian vegetation	DRB
4.18	none found	DRB
4.19	banded female (OM-Y) alone mostly	DRB
5.16	banded male (RM-LG) investigates BNCY36 family	DRB
6.13	banded pair (male RM-LG, female OM-Y) tending 2 young	DRB
6.19	none found	DRB
7.18	banded pair (male RM-LG, female OM-Y) in landscaping and mustard	DRB
7.25	banded female (OM-Y) with UB male at BNCY38	DK
8.1	banded female (OM-Y) with UB male	DK
9.23	local pair not found; pair from BNCY36 (MP-LB, 2000-1; M-WW, 2000-2) in BNCY36 and BNCY30	DRB
BNCY31	[merged with BNCY1 in 1999; habitat 2.3.6/2.3.1, all of it revegetated]	
3.2	none seen	DRB
4.6	banded pair (female O-MDB, 1998-16; male RY-M, 1999-38) at N ¹ /3EE in <i>Artemisia</i>	DRB
4.13	banded pair (female O-MDB; male RY-M) at N ¹ /3EE in <i>Artemisia</i>	DRB
4.19	banded pair (female O-MDB; male RY-M) at N ¹ /3YY(2 days old) in <i>Artemisia</i>	DRB
5.2	N ¹ failed; banded pair (female O-MDB; male RY-M) foraged together for 20+ minutes	RAE
5.14	banded pair (female O-MDB; male RY-M) at N ² /4EE in <i>Artemisia</i>	DRB
5.29	N ² failed; banded pair (female O-MDB; male RY-M) at N ³ /4EE in <i>Artemisia</i> in BNCY1	RAE
6.11	N ³ failed; banded pair (female O-MDB; male RY-M) at new N ⁴ /4EE in <i>Artemisia</i> in BNCY1	DRB
6.17	banded pair (female O-MDB; male RY-M) at N ⁴ /4EE in <i>Artemisia</i> in BNCY1	DRB
6.21	N ⁴ in BNCY1 failed; banded female (O-MDB) N ⁵ B in BNCY31	DRB
7.16	banded male (RY-M) present; failed N ⁵ /4EE in <i>Artemisia</i>	DRB
8.1	banded pair (female O-MDB; male RY-M) foraging together in BNCY1	RAE
9.24	none found	DRB
BNCY32	[habitat 2.3.6/2.3.1, all of it revegetated]	
3.1	banded pair (male: DB-MLG/Y, 1998-C and female: MDG-R, 1998-39; as in 1999) in BNCY32/34	DRB
4.5	banded pair (male: DB-MLG/Y; female: MDG-R) present	DRB
4.17	banded pair (male: DB-MLG/Y; female: MDG-R) present	DRB
4.19	banded pair (male: DB-MLG/Y; female: MDG-R) present; male roamed widely and is possibly unmated	DRB
5.18	banded pair (male: DB-MLG/Y; female: MDG-R) tending 4 fledglings	DRB
6.12	banded pair (male: DB-MLG/Y; female: MDG-R) tending 3-4 young	DRB
6.13	male (DB-MLG/Y) and 3 young seen; also dispersing juvenile (M-WR, 2000-10; from BNCY4) present	DRB
6.20	banded pair (male: DB-MLG/Y; female: MDG-R) N ² B in <i>Artemisia</i> or <i>Encelia</i>	DRB
6.21	banded pair (male: DB-MLG/Y; female: MDG-R) N ² B in <i>Artemisia</i> (new N)	DRB
6.25	N ² and birds not found	DRB

7.4	banded pair (male: DB-MLG/Y ; female: MDG-R) present	RAE
7.15	banded pair (male: DB-MLG/Y ; female: MDG-R) present	DRB
9.23	banded pair (male: DB-MLG/Y ; female: MDG-R) present	DRB
BNCY33	[merged with BNCY23 in 1999; habitat 2.3.6, all of it revegetated]	
4.5	UB female and UK male present, mostly in riparian vegetation (=Bison bridge pair?)	DRB
4.19	none found	DRB
9.23	none found	DRB
BNCY34	[merged with BNCY32 in 2000; habitat 2.3.6 (reveg)/2.4]	
BNCY35	[habitat 2.3.1]	
6.12	banded male (M-LG/YLB, 1998-28) and UB female present in BNCY7, male visited BNCY35	DRB
6.21 2	UB juveniles present, but apart	DRB
6.24	UB juvenile near BNCY23	DRB
7.4	banded juvenile (M-R, formerly M-WR?, 2000-10?) and UB juvenile present	RAE
9.23	none found	DRB
BNCY36	[habitat 2.3.9/2.3.10/2.3.1 (revegetated)]	
3.1	banded male (YDB-M, 1999-14 ; born at BNCY26 in 1999) and UB female present	DRB
5.16	BNCY30 banded male (RM-LG, 1999-35) investigates UB pair with 2 young here	DRB
5.17	pair (banded: male MP-LB, 2000-1 , female M-WW, 2000-2) tending 2 juveniles (one banded: MLG-DG, 2000-3)	DRB
6.12	banded pair (male MP-LB , female M-WW) tending 2 juveniles (MLG-DG, UB)	DRB
6.13	banded pair (male MP-LB , female M-WW) present	DRB
7.4	banded male (MP-LB) present, escaped lunging greater roadrunner	RAE
7.18	banded pair (male MP-LB , female M-WW) foraging alone	DRB
9.23	banded pair (male MP-LB , female M-WW) in BNCY36 and BNCY30	DRB
BNCY 37	[habitat 2.3.6 (revegetated)]	
1.12	banded male (RM-LB, 1999-22 ; at BNCY25 in 1999) and UB female present	AW
4.6	banded male (RM-LB) and UB female present	AW
4.11	banded male (RM-LB) and UB female present	DK
4.18	UB female present	DK
4.25	UB female present	DK
5.2	banded male (RM-LB) and UB female tending N ¹ /4YY(1-2 days old) in <i>Artemisia</i>	DK,RAE
5.9	N ¹ /4YY(banded: W/R-Y/LGM, 2000-E; RLG/Y-M, 2000-F; Y/LG-LG/YM, 2000-G; Y/LG-MDB, 2000-H)	DK
5.15	banded male (RM-LB) and UB female tending 4 banded fledglings	DK
5.23	none found	DK
5.25	none found	DK
5.30	banded male (RM-LB) and UB female tending banded fledglings	DK
6.6	banded male (RM-LB) and UB female tending banded fledglings	DK
6.13	banded male (RM-LB) and UB female at N ² /4EE in <i>Artemisia</i>	DK
6.23	banded male (RM-LB) alone? in BNCY25	DRB
6.24	N ² /1Y3EE in <i>Artemisia</i>	DK
7.1	N ² failed; banded male (RM-LB) and UB female N ³ B in <i>Artemisia</i>	DK
7.4	N ³ in <i>Artemisia</i> complete, but empty	DK
7.11	UB female on N ³ in <i>Artemisia</i>	DK
7.18	banded male (RM-LB) on N ³ in <i>Artemisia</i>	DK
7.25	N ³ /1Y3EE in <i>Artemisia</i>	DK
8.1	N ³ failed; banded male (RM-LB) and UB female present	DK
8.8	banded male (RM-LB) and UB female present	DK
9.21	none found; banded male (RM-LB) in BNCY25	DRB
BNCY38	[habitat 2.3.6 (revegetation)]	
3.14	UB pair present	DK
3.22	UB pair N ¹ B in <i>Artemisia</i>	DK
3.28	N ¹ /1E in <i>Artemisia</i>	DK
4.4	N ¹ failed; UB pair N ² B in <i>Artemisia</i>	DK
4.11	N ² failed; UB pair at N ³ /1E in <i>Artemisia</i>	DK
4.18	UB female on N ³ /EE in <i>Artemisia</i>	DK
4.25	UB female on N ³ /EE in <i>Artemisia</i>	DK
4.28	UB female at N ³ /3YY1E in <i>Artemisia</i>	RAE
5.2	N ³ /4YY in <i>Artemisia</i>	DK

5.5	N ³ /4YY (banded: W/R-LGM, 2000-A; MW/R-DG, 2000-B; MY/LG-P, 2000-C; M-PDG, 2000-D)	DK
5.9	UB pair tending N ³ /4YY in <i>Artemisia</i>	DK
5.12	UB pair tending 4 banded fledglings (W/R-LGM, MW/R-DG, MY/LG-P, M-PDG)	DK
5.15	UB pair tending 4 banded fledglings (W/R-LGM, MW/R-DG, MY/LG-P, M-PDG)	DK
5.18	UB male tending two fledglings	DK
5.23	UB male tending two fledglings	DK
5.25	UB male tending two fledglings	DK
5.30	UB male tending two banded fledglings (MY/LG-P, M-PDG)	DK
6.4	UB male tending two banded fledglings (MY/LG-P, M-PDG)	AW
6.6	UB male chasing juvenile	DK
6.13	UB male present	DK
6.27-7.11	none found	DK
7.18	UB male present	DK
7.25	UB male with banded female (OM-Y; from BNCY30)	DK
8.1	UB male with UK female	DK
8.8	none found	DK
9.21	UB pair in riparian below	DRB
BNCY39	[habitat 2.3.6, all revegetated]	
9.15	UB juvenile present	A. Wolf
12.14	UB male present	A. Wolf
BNCY-A	[habitat 2.3.10]	
BNCY-B	[most of territory cleared in Jan/Feb 1997; habitat was 2.3.6/2.3.10, habitat is 2.8.1/4.6]	
BNCY-C	[habitat 4.1(<i>Brassica</i>)/4.6]	
BNCY-D	[habitat 4.6]	
BNCY-E	[habitat 2.3.10 (<i>Artemisia/Eriogonum/Baccharis pilularis</i>); DRB estimated 50% lost by March 2000]	
BNCY-F	[habitat 2.3.10 (<i>Artemisia/Eriogonum</i> etc.)]	
BNCY-G	[habitat 2.3.10 (<i>Artemisia/Eriogonum</i> etc.)?]	

APPENDIX F

HISTORY OF COLOR-BANDED CALIFORNIA GNATCATCHERS OBSERVED IN THIS STUDY 1996-2000

HISTORY OF COLOR-BANDED CALIFORNIA GNATCATCHERS OBSERVED IN THIS STUDY 1996-2000

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1996-1 - male (DBO-M; USFWS# 208040506; banded 2.27.96)			
2.27-7.5.96	BNCY9	paired with UB female, but no nesting	LSA 1997
9.17.96	BNCY9; cleared in Jan/Feb 1997	paired with UB female	LSA 1997
1996-2 - male (LBP-M; USFWS# 208040504; banded 2.27.96)			
2.18-6.9.96	BNCY11	nested unsuccessfully with UB female	LSA 1997
9.17.96	BNCY5	paired with UB female	LSA 1997
3.8-6.28.97	BNCY5	fledged four young with 1997-45	LSA 1998a
10.12.97	BNCY5	appeared paired with 1997-23	LSA 1998a
1.4.98	BNCY4	"paired" with UB female	LSA 1998b
3.27-7.12.98	BNCY4	fledged three young with 1997-22	LSA 1998b
11.30.98	BNCY4	paired with 1997-22	LSA 1998b
1.3.99	BNCY4	"alone"	LSA 1999
3.2-7.15.99	BNCY4	nested unsuccessfully with 1997-22	LSA 1999
9.19.99	BNCY4	with 1997-22	LSA 1999
3.1-7.15.00	BNCY4	fledged three young with 1997-22	this study
1996-3 - male (MW-Y; USFWS# 208040505; banded 2.27.96)			
2.27-7.29.96	BNCY26	nested unsuccessfully with UB female	LSA 1997
2.16-7.10.97	BNCY26	fledged four young with 1997-60	LSA 1998a
10.12.97-	BNCY26	paired with 1997-60	LSA 1998a,b
2.27.98			
3.30-7.26.98	BNCY26	fledged eight young from two broods with 1997-60	LSA 1998b
1996-4 - female (LGM-W; USFWS# 208040502; banded 2.27.96)			
2.27-7.29.96	BNCY18	fledged six young from two broods with 1996-27	LSA 1997
1996-5 - male (DBM-R; USFWS# 208040503; banded 2.27.96)			
2.27.96	BNCY18	adult	LSA 1997
1996-6 - male (R-MP; USFWS# 208040511; banded 2.29.96)			
2.29.96	BNCY12	adult	LSA 1997
1996-7 - male (PM-W; USFWS# 208040508; banded 2.29.96)			
2.29.96	BNCY15	adult	LSA 1997
1996-8 - female (LBY-M; USFWS# 208040507; banded 2.29.96)			
2.16-7.13.96	BNCY17	fledged 3-4 young from one brood with 1996-31	LSA 1997
2.16-6.29.97	BNCY17	fledged at least four young from two broods with 1996-31	LSA 1998a
1996-9 - male (DG-LGM; USFWS# 208040510; banded 2.29.96)			
2.29-6.8.96	BNCY28	fledged young (number unknown) from one brood with 1996-10	LSA 1997
2.16-3.9.97	BNCY28	paired with 1996-10 and clinging to remnants of territory	LSA 1998a

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
4.6.97	BNCY27W	paired with 1996-10 in an adjacent territory	LSA 1998a
1996-10 - female (O-YM; USFWS# 208040509; banded 2.29.96)			
2.29-6.8.96	BNCY28	fledged young (number unknown) from one brood with 1996-9	LSA 1997
2.16-3.9.97	BNCY28	paired with 1996-9 and clinging to remnants of territory	LSA 1998a
4.6.97	BNCY27W	paired with 1996-9 in an adjacent territory	LSA 1998a
6.29.97	BNCY16	alone	LSA 1998a
10.14.97	BNCY16	paired with 1997-6	LSA 1998a
3.15-7.26.98	BNCY16	fledged 2-4 young with 1997-6	LSA 1998b
1.3.99	BNCY16	paired with 1997-6	LSA 1999
3.7-7.13.99	BNCY16	fledged three young with 1997-6	LSA 1999
1996-11 - sex unknown (Y/LGM-R; USFWS# 206048503; banded 5.13.96)			
5.13.96	BNCY11	nestling	LSA 1997
1996-12 - sex unknown (R/WM-Y; USFWS# 206048504; banded 5.13.96)			
5.13.96	BNCY11	nestling	LSA 1997
1996-13 - sex unknown (R/WM-DG; USFWS# 206048505; banded 5.13.96)			
5.13.96	BNCY11	nestling	LSA 1997
1996-14 - male (R/WM-DB; USFWS# 206048509; banded 5.17.96)			
4.13-6.3.96	BNCY8	fledged three young with UB female	LSA 1997
1996-15 - sex unknown (Y/LGM-LG; USFWS# 206048506; banded 5.17.96)			
5.17.96	BNCY8	fledgling	LSA 1997
7.15.96	Turtle Rock (location 7)	juvenile	LSA 1997
1996-16 - sex unknown (Y/LGM-P; USFWS# 206048507; banded 5.17.96)			
5.17.96	BNCY8	fledgling	LSA 1997
7.11.96	BNCY2	juvenile	LSA 1997
1996-17 - sex unknown (R/WM-O; USFWS# 206048508; banded 5.17.96)			
5.17.96	BNCY8	fledgling	LSA 1997
1996-18 - male (MY/LG-R; USFWS# 206048510; banded 5.17.96)			
4.28-7.11.96	BNCY30	fledged two young with 1996-19	LSA 1997
9.17-10.3.96	BNCY30	paired with 1996-19	LSA 1997
2.16-6.7.97	BNCY30	fledged four young with 1997-34	LSA 1998a
10.6.97	BNCY30	paired with 1997-34	LSA 1998a
1996-19 - female (MR/W-Y; USFWS# 206048511; banded 5.17.96)			
4.28-7.11.96	BNCY30	fledged two young with 1996-18	LSA 1997
9.17-10.3.96	BNCY30	paired with 1996-18	LSA 1997
1996-20 - sex unknown (MY/LG-W; USFWS# 206048512; banded 5.17.96)			
5.13-20.96	BNCY30	dependent young (parents 1996-18 and 1996-19)	LSA 1997
1996-21 - sex unknown (DBM-R/W; USFWS# 206048513; banded 5.17.96)			
5.13-20.96	BNCY30	dependent young (parents 1996-18 and 1996-19)	LSA 1997
1996-22 - male (DGM-Y/LG; USFWS# 206048516; banded 5.23.96)			
4.14-5.23.96	BNCY12	fledged three young with 1996-23	LSA 1997
2.17.97	BNCY12	paired with UB female	LSA 1998a
1996-23 - female (WM-R/W; USFWS# 206048515; banded 5.23.96)			

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
4.14-5.23.96	BNCY12	fledged three young with 1996-22	LSA 1997
1996-24 - sex unknown (MR/W-B; USFWS# 206048517; banded 5.23.96)			
5.23.96	BNCY12	fledgling (parents 1996-22 and 1996-23)	LSA 1997
7.29.96	BNCY23	juvenile	LSA 1997
1996-25 - sex unknown (M-RY/LG; USFWS# 206048518; banded 5.23.96)			
5.23.96	BNCY12	fledgling (parents 1996-22 and 1996-23)	LSA 1997
1996-26 - male (RM-B; USFWS# 206048524; banded 5.26.96)			
4.14-5.26.96	BNCY15	nested unsuccessfully with UB female	LSA 1997
1996-27 - male (YM-LP; USFWS# 206048525; banded 5.27.96)			
3.25-7.29.96	BNCY18	fledged six young from two broods with 1996-4	LSA 1997
11.20.96	BNCY18/5	paired?	LSA 1997
2.16.97	BNCY18	appeared paired with UB female	LSA 1998a
1996-28 - female (MLP-DB; USFWS# 206048526; banded 5.27.96; changed to MR/W-DB on 7.16.97; changed to YM-DB on 7.11.98)			
5.27.96	BNCY18	fledgling	LSA 1997
2.16-7.16.97	BNCY2	nested unsuccessfully with 1997-75	LSA 1998a
1.4.98	BNCY2W	"paired" with 1997-69	LSA 1998b
3.27-7.11.98	BNCY2	nested unsuccessfully with 1997-79	LSA 1998b
9.29.98-1.3.99	BNCY2	paired with 1997-79	LSA 1998b, 1999
3.1-7.15.99	BNCY2	fledged three young with 1997-79	LSA 1999
9.19.99	BNCY2/11	with 1997-79	LSA 1999
11.6.99	lower BNCY2	with 1997-79	LSA 1999
3.6-5.19.00	BNCY2	raised 3-4 young with 1998-D	this study
1996-29 - male (MO-LP; USFWS# 206048527; banded 5.27.96; changed to M-BB on 7.16.97)			
5.27.96	BNCY18	fledgling	LSA 1997
7.1-11.96	BNCY11	juvenile	LSA 1997
2.16-5.17.97	BNCY9	nested unsuccessfully with UB female	LSA 1998a
5.25-7.16.97	BNCY9	paired with UB female	LSA 1998a
1.4.98	BNCY7	"paired" with unknown female	LSA 1998b
3.28-7.25.98	BNCY7	fledged 5-7 young with 1997-71	LSA 1998b
3.4-7.15.99	BNCY7	fledged two young with UB female	LSA 1999
1996-30 - sex unknown (MY/LG-LP; USFWS# 206048528; banded 5.27.96)			
5.27.96	BNCY18	fledgling (parents 1996-4 and 1996-27)	LSA 1997
1996-31 - male (YLP-M; USFWS# 206048556; banded 7.13.96; changed to YW/R-M on 4.13.97)			
2.16-7.13.96	BNCY17	fledged 3-4 young with 1996-8	LSA 1997
2.16-6.29.97	BNCY17	fledged at least four young from two broods with 1996-8	LSA 1998a
10.6.97	BNCY17	paired with UB female	LSA 1998a
1996-32 - sex unknown (OY/LG-M; USFWS# 206048557; banded 7.13.96)			
7.13.96	BNCY17	juvenile (parents 1996-8 and 1996-31)	LSA 1997
1996-33 - sex unknown (DBR/W-M; USFWS# 206048558; banded 7.13.96)			
7.13.96	BNCY17	juvenile (parents 1996-8 and 1996-31)	LSA 1997
7.29.96	BNCY23 and 8	juvenile	LSA 1997

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1996-34 - sex unknown (BR-M; USFWS# 206048559; banded 7.14.96)			
7.14.96	BNCY18	fledgling (parents 1996-4 and 1996-27)	LSA 1997
1996-35 - sex unknown (Y/LGLG-M; USFWS# 206048560; banded 7.14.96)			
7.14.96	BNCY18	fledgling (parents 1996-4 and 1996-27)	LSA 1997
1996-36 - sex unknown (W-BM; USFWS# 206048561; banded 7.14.96)			
7.14.96	BNCY18	fledgling (parents 1996-4 and 1996-27)	LSA 1997
1996-A - female (DGM-Y; USFWS# 171049930; banded 4.30.93)			
4.30-6.4.93	UCI Ecological Reserve	dependent young	LSA 1997
6.28.93	below Bonita Reservoir (BNCY3)	juvenile	LSA 1994
Aug -Oct 93	BNCY3	paired with male (R-RM)	LSA 1994
2.18-7.4.96	BNCY3	nested unsuccessfully with an unbanded male	LSA 1997
9.17.96	BNCY3	banded female seen, combination unconfirmed	LSA 1997
1996-B - female (DBW-M; USFWS# 205012159; banded 5.23.95)			
5.23.95	Crystal Cove State Park, coastal terrace	nestling	LSA 1997
2.16.96	BNCY15	with UB male	LSA 1997
4.28-5.23.96	BNCY10	paired with UB male	LSA 1997
7.1-11.96	BNCY3/10/11	paired and alone	LSA 1997
9.29.96	BNCY25	alone	LSA 1997
1996-C - male (RB-M; USFWS# 206048458; banded 6.20.96)			
6.20.96	below Sand Canyon Reservoir	nestling	LSA 1997
9.22.96	Upper Newport Bay, west side (NBB10)	paired with UB female	LSA 1997
10.2.97	Upper Newport Bay, west side (NBB10)	paired with UB female	LSA 1998a
10.14.98	Upper Newport Bay, west side (NBB10)	paired with UB female	LSA 1998b
10.18.99	Upper Newport Bay, west side (NBB10)	paired with UB female	LSA 1999
1997-1 - male (BM-W; USFWS# 206048579; banded 4.12.97)			
2.16-6.28.97	BNCY23	fledged 5-7 young from two broods with 1997-2	LSA 1998a
10.12.97	BNCY23	paired with 1997-2	LSA 1998a
3.31-7.25.98	BNCY23	fledged four young with 1997-23	LSA 1998b
1997-2 - female (R/WM-LG; USFWS# 206048580; banded 4.12.97)			
2.16-6.28.97	BNCY23	fledged 5-7 young from two broods with 1997-1	LSA 1998a
10.12.97	BNCY23	paired with 1997-1	LSA 1998a
1997-3 - female (Y/LGM-DG; USFWS# 206048581; banded 4.12.97)			
4.12.97	BNCY23	fledgling	LSA 1998a
1.4.98	BNCY25	"paired" with UB male	LSA 1998b

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
3.15-29.98	BNCY25	laid 4 eggs with 1998-20 (young fledged in May)	LSA 1998b
5.16.98+	BNCY25	not found	LSA 1998b
1997-4 - sex unknown (R/WM-W; USFWS# 206048582; banded 4.12.97)	BNCY23	fledgling	LSA 1998a
1997-5 - sex unknown (BM-O; USFWS# 206048583; banded 4.12.97)	BNCY23	fledgling	LSA 1998a
1997-6 - male (BM-DB; USFWS# 206048584; banded 4.13.97)	BNCY16	fledged three young with 1997-7	LSA 1998a
3.9-5.26.97	BNCY15	fighting UB male	LSA 1998a
6.29.97	BNCY16	paired with 1996-10	LSA 1998a
10.14.97	BNCY16	fledged 2-4 young with 1996-10	LSA 1998b
3.15-7.26.98	BNCY16	paired with 1996-10	LSA 1999
1.3.99	BNCY16	fledged three young with 1996-10	LSA 1999
3.7-7.13.99	BNCY15	fledged four young with 2000-19	this study
3.6-6.14.00	BNCY15	with 2000-19	this study
7.18.00	BNCY15	with UK female	this study
9.21.00	BNCY15		
1997-7 - female (R/WM-R/W; USFWS# 206048585; banded 4.13.97)	BNCY16	fledged three young with 1997-6	LSA 1998a
3.9-5.26.97	BNCY16		
1997-8 - male (YM-B; USFWS# 206048586; banded 4.13.97)	BNCY16	fledgling	LSA 1998a
4.13-19.97	BNCY16	with two siblings	LSA 1998a
5.18.97	ridge SE of Signal Peak	male with UK female	LSA 1998b
5.10.98			
1997-9 - sex unknown (WM-B; USFWS# 206048587; banded 4.13.97)	BNCY16	fledgling	LSA 1998a
4.13-19.97	BNCY16	with two siblings	LSA 1998a
5.18.97			
1997-10 - sex unknown (LGM-B; USFWS# 206048588; banded 4.13.97)	BNCY16	fledgling	LSA 1998a
4.13-19.97	BNCY16	with two siblings	LSA 1998a
5.18.97			
1997-11 - sex unknown (DGM-B; USFWS# 206048589; banded 4.13.97)	BNCY17	fledgling/juvenile	LSA 1998a
4.13-5.1.97			
1997-12 - sex unknown (LGM-R/W; USFWS# 206048590; banded 4.14.97)	BNCY31	nestling	LSA 1998a
4.14.97	BNCY31	fledgling	LSA 1998a
5.1.97			
1997-13 - sex unknown (DGM-R/W; USFWS# 206048591; banded 4.14.97)	BNCY31	nestling	LSA 1998a
4.14.97	BNCY31	fledgling	LSA 1998a
5.1.97	Coyote Canyon	dispersed juvenile	LSA 1998a
June/July 97			
1997-14 - sex unknown (PM-R/W; USFWS# 206048592; banded 4.14.97)	BNCY31	nestling	LSA 1998a
4.14.97	BNCY31	fledgling/juvenile	LSA 1998a
4.23-5.1.97	W of BNCY7	dispersing juvenile	LSA 1998a
5.31.97	BNCY31	juvenile back at natal territory	LSA 1998a
6.3.97			
1997-15 - sex unknown (LBM-B; USFWS# 206048593; banded 4.14.97)	BNCY9	nestling	LSA 1998a
4.14.97			

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1997-16 - sex unknown (DBM-B; USFWS# 206048594; banded 4.14.97)			
4.14.97	BNCY9	nestling	LSA 1998a
1997-17 - sex unknown (R/WM-B; USFWS# 206048595; banded 4.14.97)			
4.14.97	BNCY9	nestling	LSA 1998a
1997-18 - sex unknown (MB-W; USFWS# 206048596; banded 4.14.97)			
4.14.97	BNCY9	nestling	LSA 1998a
1997-19 - male (MB-R; USFWS# 206048598; banded 4.18.97)			
2.16-7.10.97	BNCY6	fledged 7-8 young from two broods with 1997-24	LSA 1998a
10.12.97	BNCY6	paired with 1997-24	LSA 1998a
1997-20 - female (PM-Y/LG; USFWS# 206048599; banded 4.18.97)			
4.11.97	BNCY6	nestling	LSA 1998a
4.18.97	BNCY6	fledgling	LSA 1998a
1.4.98	BNCY19	"paired" with 1998-A	LSA 1998b
3.27-7.7.98	BNCY19	fledged three young with 1998-8	LSA 1998b
1.3.99	BNCY19	"paired" with 1998-B	LSA 1999
3.2-7.15.99	BNCY19	fledged three young with 1998-B	LSA 1999
3.7-6.23.00	BNCY19	fledged four young with 1998-B	this study
7.4-9.24.00	BNCY19	paired with 1998-B	this study
1997-21 - sex unknown (LBM-Y/LG; USFWS# 206048600; banded 4.18.97)			
4.11.97	BNCY6	nestling	LSA 1998a
4.18.97	BNCY6	fledgling	LSA 1998a
5.31.97	W of BNCY7	dispersing juvenile	LSA 1998a
1997-22 - female (DBM-Y/LG; USFWS# 211036901; banded 4.18.97)			
4.11.97	BNCY6	nestling	LSA 1998a
4.18.97	BNCY6	fledgling	LSA 1998a
5.16.97	BNCY6	part of loose family group	LSA 1998a
6.1.97	BNCY5	dispersed juvenile	LSA 1998a
3.27-7.12.98	BNCY4	fledged three young with 1996-2	LSA 1998b
11.30.98	BNCY4	paired with 1996-2	LSA 1998b
3.2-7.15.99	BNCY4	nested unsuccessfully with 1996-2	LSA 1999
9.19.99	BNCY4	paired with 1996-2	LSA 1999
3.30-7.15.00	BNCY4	fledged three young with 1996-2	this study
1997-23- female (BM-Y/LG; USFWS# 211036902; banded 4.18.97)			
4.11.97	BNCY6	nestling	LSA 1998a
4.18.97	BNCY6	fledgling	LSA 1998a
5.22-6.28.97	BNCY5	dispersed juvenile	LSA 1998a
10.12.97	BNCY5	appeared paired with 1996-2	LSA 1998a
12.3.97	BNCY5	appeared paired with 1997-76	LSA 1998a
3.31-7.25.98	BNCY23	fledged four young with 1997-1	LSA 1998b
3.2-7.12.99	BNCY23/33	fledged 3-4 young with UB male	LSA 1999

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information	
	9.19.99	BNCY33	with UB male, 1998-C, and 1998-39	LSA 1999
	3.1-7.18.00	BNCY23/33	fledged four young with 2000-5	this study
1997-24 - female (WM-Y/LG; USFWS# 211036903; banded 4.18.97)	2.16-7.10.97	BNCY6	fledged 7-8 young from two broods with 1997-19	LSA 1998a
	10.12.97	BNCY6	paired with 1997-19	LSA 1998a
	3.27-7.4.98	BNCY6	fledged four young with 1998-31	LSA 1998b
	10.28.98	BNCY6	paired with 1998-31	LSA 1998b
	3.2-7.15.99	BNCY6	fledged 6-7 young from two broods with 1999-A	LSA 1999
	3.2-6.18.00	BNCY6	fledged 3+ young with 1999-A	this study
1997-25 - male (R/W-M-Y/LG; USFWS# 211036904; banded 4.19.97)	4.13-20.97	BNCY27	nestling	LSA 1998a
	5.1-18.97	BNCY27	dependent young	LSA 1998a
	7.20.97	BNCY5	dispersing juvenile	LSA 1998a
	10.12.97	BNCY18	alone	LSA 1998a
1997-26 - sex unknown (R/W-R/W-M; USFWS# 211036905; banded 4.19.97)	4.13-20.97	BNCY27	nestling	LSA 1998a
	5.1.97	BNCY27	fledgling	LSA 1998a
1997-27 - sex unknown (R/W-DGM; USFWS# 211036906; banded 4.19.97)	4.13-20.97	BNCY27	nestling	LSA 1998a
1997-28 - sex unknown (R/W-DBM; USFWS# 211036911; banded 4.21.97)	4.18-21.97	BNCY1	nestling	LSA 1998a
1997-29 - sex unknown (Y/LG-Y/LGM; USFWS# 211036912; banded 4.21.97)	4.18-21.97	BNCY1	nestling	LSA 1998a
1997-30 - sex unknown (Y/LG-RM; USFWS# 211036913; banded 4.21.97)	4.18-21.97	BNCY1	nestling	LSA 1998a
1997-31 - female (Y/LG-LGM; USFWS# 211036914; banded 5.24.97)	2.17-6.28.97	BNCY13	fledged 3-4 young with UB male	LSA 1998a
1997-32 - sex unknown (Y/LG-OM; USFWS# 211036915; banded 5.24.97)	4.19-5.1.97	BNCY13	nestling	LSA 1998a
	5.4-24.97	BNCY13	fledgling/juvenile	LSA 1998a
	6.29.97	BNCY25	dispersing juvenile	LSA 1998a
1997-33 - sex unknown (Y/LG-LBM; USFWS# 211036916; banded 5.24.97)	4.19-5.1.97	BNCY13	nestling	LSA 1998a
	5.4-24.97	BNCY13	fledgling/juvenile	LSA 1998a
1997-34 - female (B-MDB; USFWS# 211036917; banded 5.24.97)	2.16-6.7.97	BNCY30	fledged four young with 1996-18	LSA 1998a
	10.6.97	BNCY30	paired with 1996-18	LSA 1998a
1997-35 - male (Y/LG-BM; USFWS# 211036918; banded 5.24.97)	5.11.97	BNCY30	nestling	LSA 1998a
	5.16-6.4.97	BNCY30	fledgling/juvenile	LSA 1998a
	5.10.98	ridge SE of Signal Peak	with UK female	LSA 1998b
1997-36 - sex unknown (Y/LG-R/W-M; USFWS# 211036919; banded 5.24.97)	5.11.97	BNCY30	nestling	LSA 1998a

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1997-37 - female (PDB-M; USFWS# 211036920; banded 5.24.97)	5.16-6.4.97 BNCY30	fledgling/juvenile	LSA 1998a
	5.11.97 BNCY30	nestling	LSA 1998a
	5.16-6.4.97 BNCY30	fledgling/juvenile	LSA 1998a
	6.29.97 BNCY15	dispersing juvenile	LSA 1998a
	7.19.97 BNCY15N	paired with 1997-79	LSA 1998a
	10.14.97 BNCY15	paired with UK male	LSA 1998a
1997-38 - sex unknown (B-MB; USFWS# 211036921; banded 5.25.97)	5.2-11.97 BNCY18	nestling	LSA 1998a
	5.16-31.97 BNCY18	fledgling/juvenile	LSA 1998a
1997-39 - sex unknown (BDG-M; USFWS# 211036922; banded 5.25.97)	5.2-11.97 BNCY18	nestling	LSA 1998a
	5.16-31.97 BNCY18	fledgling/juvenile	LSA 1998a
	6.28.97 BNCY5	dispersing juvenile	LSA 1998a
1997-40 - sex unknown (BR/W-M; USFWS# 211036923; banded 5.25.97)	5.2-11.97 BNCY18	nestling	LSA 1998a
	5.16-31.97 BNCY18	fledgling/juvenile	LSA 1998a
1997-41 - sex unknown (BY/LG-M; USFWS# 211036924; banded 5.25.97)	5.2-11.97 BNCY18	nestling	LSA 1998a
	5.16-31.97 BNCY18	fledgling/juvenile	LSA 1998a
1997-42 - male (R/W-MR/W; USFWS# 211036925; banded 5.25.97)	3.8-6.28.97 BNCY18	fledged four young with 1997-43	LSA 1998a
	10.12.97 BNCY18	paired with 1997-43	LSA 1998a
1997-43 - female (LBDB-M; USFWS# 211036926; banded 5.25.97; changed to LB-MDB on 5.23.98)	3.8-6.28.97 BNCY18	fledged four young with 1997-42	LSA 1998a
	10.12.97 BNCY18	paired with 1997-42	LSA 1998a
	3.27-4.1.98 BNCY18	nested unsuccessfully with 1997-75	LSA 1998b
	5.11-7.10.98 BNCY18	fledged three young with UB male	LSA 1998b
	10.28.98- 1.14.99 BNCY26	paired with UB male	LSA 1998b, 1999
	2.5-7.27.99 BNCY26/18S	fledged 6-7 young from two broods with UB male	LSA 1999
	9.20.99 BNCY26/18	alone	LSA 1999
	11.6.99 adjacent BNCY18	with UK male	LSA 1999
	12.3.99 BNCY26 and vicinity	with UB male	LSA 1999
	3.6-7.16.00 BNCY18	fledged three young with UB male	this study
	9.24-26.00 BNCY18	with UB male	this study
	11.22.00 BNCY18/26	present	this study
1997-44 - male (BB-M; USFWS# 211036927; banded 5.26.97)	2.16-6.7.97 BNCY27	fledged 2+ young with UB female	LSA 1998a
1997-45 - female (R/WB-M; USFWS# 211036932; banded 6.1.97)	3.8-6.28.97 BNCY5	fledged four young with 1996-2	LSA 1998a
	10.12.97 BNCY5	alone	LSA 1998a
1997-46 - male (Y/LGY/LG-M; USFWS# 211036933; banded 6.1.97)	5.17-25.97 BNCY5	nestling	LSA 1998a

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
5.29-6.1.97	BNCY5	fledgling	LSA 1998a
6.28.97	BNCY5	juvenile	LSA 1998a
4.20.98	Coyote Canyon landfill (CCL2)	with UB female	LSA 1998b
3.2-7.27.99	CCL2	fledged one young with UB female	LSA 1999
6.16-20.00	CCL2	nesting with UB female	J.N. Ko
8.22-29.00	CCL2/11	with UB female	D. Kamada
1997-47- sex unknown (R/WY/LG-M; USFWS# 211036934; banded 6.1.97)			
5.17-25.97	BNCY5	nestling	LSA 1998a
5.29-6.1.97	BNCY5	fledgling	LSA 1998a
1997-48- sex unknown (B-MR/W; USFWS# 211036935; banded 6.1.97)			
5.17-25.97	BNCY5	nestling	LSA 1998a
5.29-6.1.97	BNCY5	fledgling	LSA 1998a
6.28.97	BNCY5	juvenile	LSA 1998a
1997-49- sex unknown (R/W-Y/LGM; USFWS# 211036940; banded 6.4.97)			
5.28-6.4.97	BNCY23	nestling	LSA 1998a
1997-50- sex unknown (W/RM-R; USFWS# 211036941; banded 6.4.97)			
5.28-6.4.97	BNCY23	nestling	LSA 1998a
6.28.97	BNCY23	fledgling	LSA 1998a
1997-51- sex unknown (LG/YM-R; USFWS# 211036942; banded 6.4.97)			
5.28-6.4.97	BNCY23	nestling	LSA 1998a
6.28.97	BNCY23	fledgling	LSA 1998a
1997-52- sex unknown (W/RM-Y; USFWS# 211036943; banded 6.7.97)			
5.26.97	BNCY17	nestling	LSA 1998a
6.7.97	BNCY17	fledgling	LSA 1998a
1997-53- sex unknown (W/RM-LG; USFWS# 211036944; banded 6.7.97)			
5.26.97	BNCY17	nestling	LSA 1998a
6.7.97	BNCY17	fledgling	LSA 1998a
6.29.97	BNCY17	juvenile	LSA 1998a
1997-54- sex unknown (LG/YM-Y; USFWS# 211036945; banded 6.7.97)			
5.26.97	BNCY17	nestling	LSA 1998a
6.7.97	BNCY17	fledgling	LSA 1998a
1997-55- male (LG/YM-O; USFWS# 211036946; banded 6.8.97)			
3.8-6.8.97	BNCY19	nested unsuccessfully with 1997-56	LSA 1998a
1997-56- female (MLG/Y-Y; USFWS# 211036947; banded 6.8.97)			
3.8-6.8.97	BNCY19	nested unsuccessfully with 1997-55	LSA 1998a
6.17-7.17.97	UCI Preserve (UCI7)	displaced, "paired" with juvenile male	LSA 1998a
1997-57- sex unknown (W/RM-W; USFWS# 211036948; banded 7.10.97)			
6.28-7.10.97	BNCY6	fledgling/juvenile	LSA 1998a
1997-58- sex unknown (LG/YM-W; USFWS# 211036949; banded 7.10.97)			
6.28-7.10.97	BNCY6	fledgling/juvenile	LSA 1998a
1997-59- sex unknown (W/RM-O; USFWS# 211036950; banded 7.10.97)			
6.28-7.10.97	BNCY6	fledgling/juvenile	LSA 1998a
1997-60- female (BM-W/R; USFWS# 211036951; banded 7.10.97)			
2.16-7.10.97	BNCY26	fledged four young with 1996-3	LSA 1998a

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
10.12.97- 2.27.98	BNCY26	paired with 1996-3	LSA 1998a,b
3.30-7.26.98	BNCY26	fledged eight young from two broods with 1996-3	LSA 1998b
8.29-9.29.98	BNCY26	paired with 1996-3	LSA 1998b
1997-61- sex unknown (LG/YM-LG; USFWS# 211036952; banded 7.10.97)			
6.2.97	BNCY26	nestling	LSA 1998a
6.28-7.10.97	BNCY26	fledgling/juvenile	LSA 1998a
1997-62 - female (LG/YM-DG; USFWS# 211036953; banded 7.10.97; changed to MLG-ODG [sic] 6.5.98)			
6.2.97	BNCY26	nestling	LSA 1998a
6.28-7.10.97	BNCY26	fledgling/juvenile	LSA 1998a
6.5-7.13.98	near Laguna Reservoir (NLL17)	paired with banded male	LSA 1998b
6.17.99	NLL17	paired with UB male	LSA 1999
1997-63- sex unknown (LG/YM-P; USFWS# 211036954; banded 7.10.97)			
6.2.97	BNCY26	nestling	LSA 1998a
6.28-7.10.97	BNCY26	fledgling/juvenile	LSA 1998a
1997-64- sex unknown (LG/YM-DB; USFWS# 211036955; banded 7.10.97)			
6.2.97	BNCY26	nestling	LSA 1998a
6.28-7.10.97	BNCY26	fledgling/juvenile	LSA 1998a
1997-65- sex unknown (W/RM-LB; USFWS# 211036956; banded 7.12.97)			
6.28-7.12.97	BNCY11	fledgling/juvenile	LSA 1998a
1997-66- sex unknown (BM-LG/Y; USFWS# 211036957; banded 7.12.97)			
6.28-7.12.97	BNCY11	fledgling/juvenile	LSA 1998a
1997-67- female (W/RM-DB; USFWS# 211036958; banded 7.12.97)			
2.16-7.12.97	BNCY11	fledged three young with 1997-69	LSA 1998a
10.12.97	BNCY11	paired with 1997-69	LSA 1998a
1997-68- sex unknown (LG/YM-DB; USFWS# 211036959; banded 7.12.97)			
6.28-7.12.97	BNCY11	fledgling/juvenile	LSA 1998a
1997-69- male (RM-LG/Y; USFWS# 211036960; banded 7.12.97)			
1.31-7.12.97	BNCY11	fledged three young with 1997-67	LSA 1998a
10.12.97	BNCY11	paired with 1997-67	LSA 1998a
1.4.98	BNCY2W	"paired" with 1996-28	LSA 1998b
1997-70 - female (MW/R-R; USFWS# 211036961; banded 7.12.97)			
2.16-7.12.97	BNCY3	nested unsuccessfully with UB male, possibly = 1997-76	LSA 1998a
1.4.98	BNCY3	"paired" with UB male	LSA 1998b
2.27.98	BNCY5	"paired" with UB male S of spillway	LSA 1998b
3.27-7.7.98	BNCY5	nested unsuccessfully with UB male S of spillway	LSA 1998b
4.1.98	BNCY7/9	possibly this bird out of territory	LSA 1998b
9.29.98	lower BNCY2 and below BNCY3		LSA 1998b
10.28.98	BNCY5	moving about with UB male with UK male	LSA 1998b
2.25-4.12.99	BNCY5	with UB male, no nesting activity	LSA 1999

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
4.25.99	BNCY5	with 1998-28, no nesting activity	LSA 1999
6.5-7.15.99	BNCY5	with UB male, no nesting activity	LSA 1999
9.19.99	BNCY2/3/5	alone	LSA 1999
11.6.-12.3.99	lower BNCY2 and adjacent mulefat	with 1998-D	LSA 1999
1997-71- female (W/RM-P; USFWS# 211036962; banded 7.13.97)			
2.16-7.13.97	BNCY7	nested unsuccessfully with 1997-72	LSA 1998a
3.28-7.7.98	BNCY7	raised 5-7 young from two broods with 1996-29	LSA 1998b
1997-72- male (YM-W/R; USFWS# 211036963; banded 7.13.97)			
2.16-7.13.97	BNCY7	nested unsuccessfully with 1997-71	LSA 1998a
1997-73- sex unknown (LG/YM-B; USFWS# 211036974; banded 7.15.97)			
7.15.97	BNCY31	fledgling/juvenile	LSA 1998a
1997-74 - female (RM-W/R; USFWS# 211036975; banded 7.15.97)			
Mar -7.15.97	BNCY31	fledged 5+ young from two broods with UB male	LSA 1998a
5.29.98	BNCY-E	with UB male, tending 2+ fledglings	LSA 1998b
7.7.98	BNCY-E	paired with UB male	LSA 1998b
1.3.99	BNCY-E	"paired" with 1997-82	LSA 1999
1997-75- male (MW-B; USFWS# 211036976; banded 7.16.97)			
2.16-7.16.97	BNCY2	nested unsuccessfully with 1996-28	LSA 1998a
3.27-4.1.98	BNCY18	nested unsuccessfully with 1997-43	LSA 1998b
1997-76- male (M-OW/R; USFWS# 211036977; banded 7.16.97)			
7.16.97	BNCY2	possible visitor from BNCY3	LSA 1998a
12.3.97	BNCY5S	appeared paired with 1997-23	LSA 1998a
1997-77- sex unknown (MR/W-DB; USFWS# 211036978; banded 7.16.97)			
7.16.97	BNCY2	non-local juvenile	LSA 1998a
1997-78 - male (DBLB-M; USFWS# 211036982; banded 7.19.97)			
7.19.97	BNCY15	adult, paired with UB female	LSA 1998a
3.15-7.26.98	BNCY15	nested unsuccessfully with UB female	LSA 1998b
1.3.99	BNCY15	paired with UB female	LSA 1999
3.7-7.13.99	BNCY15	fledged four young with UB female	LSA 1999
1997-79 - male (M-W/RLG; USFWS# 211036983; banded 7.19.97)			
7.19.97	BNCY15N	adult, "paired" with 1997-37	LSA 1998a
3.27-7.11.98	BNCY2	nested unsuccessfully with 1996-28	LSA 1998b
9.29.98-1.3.99	BNCY2	paired with 1996-28	LSA 1998b, 1999
3.1-7.15.99	BNCY2	fledged three young with 1996-28	LSA 1999
9.19.99	BNCY2/11	with 1996-28	LSA 1999
11.6.99	lower BNCY2	with 1996-28	LSA 1999
1997-80- female (M-W/RP; USFWS# 211036984; banded 7.20.97)			
4.16-7.20.97	BNCY-B	fledged two young with 1997-81	LSA 1998a
1997-81- male (LBB-M; USFWS# 211036985; banded 7.20.97)			
4.16-7.20.97	BNCY-B	fledged two young with 1997-80	LSA 1998a
1997-82 - male (OM-LG/Y; USFWS# 211036986; banded 7.21.97)			

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
7.21.97	BNCY31	apparent non-local juvenile	LSA 1998a
10.13.97	BNCY31	paired with UB female	LSA 1998a
2.27-7.9.98	BNCY31	fledged 2-3 young with 1998-16	LSA 1998b
1.3.99	BNCY-E	"paired" with 1997-74	LSA 1999
3.3-7.16.99	BNCY-E	paired with UB female	LSA 1999
9.21.99	BNCY-E	"with" UK bird	LSA 1999
1997-A - female (W/RLG-M; probably USFWS# 211029141; banded 6.16.97; see text)			
6.16-7.18.97	Upper Newport Bay east side (NBB4)	nestling/fledgling	LSA 1998a
10.2.97	Upper Newport Bay, east side	paired with UB male	LSA 1998a
1997-B- sex unknown (M-LGY/LG; USFWS# 206019516; banded 4.14.97)			
4.14-5.17.97	UCI Preserve (UCI4)	fledgling/juvenile	LSA 1998a
6.4.97	BNCY2	dispersing juvenile	LSA 1998a
1997-C- female (M-BY; USFWS# 206019504; banded 4.10.97)			
4.10-5.1.97	UCI Preserve (UCI6)	fledgling/juvenile	LSA 1998a
6.30-7.21.97	BNCY14	paired with UB male	LSA 1998a
1997-D - female (M-R/WLB; USFWS# 206048547; banded 7.10.96)			
7.10-15.96	Turtle Rock Fragments	nestling	LSA 1998a
5.2.97	BNCY26/1	alone	LSA 1998a
5.24-6.3.97	BNCY1	paired with UB male	LSA 1998a
1998-1 - sex unknown (LG/Y-PM; USFWS# 211089601; banded 5.14.98)			
5.12-14.98	BNCY26	fledgling	LSA 1998b
1998-2 - sex unknown (LG/Y-OM; USFWS# 211089602; banded 5.14.98)			
5.12-14.98	BNCY26	fledgling	LSA 1998b
1998-3 - sex unknown (W-MLG/Y; USFWS# 211089603; banded 5.14.98)			
5.12-14.98	BNCY26	fledgling	LSA 1998b
1998-4 - sex unknown (LG/Y-RM; USFWS# 211089604; banded 5.14.98)			
5.12-14.98	BNCY26	fledgling	LSA 1998b
1998-5 - sex unknown (LG-MLG/Y; USFWS# 211089605; banded 5.15.98)			
5.11-22.98	BNCY19	fledgling	LSA 1998b
1998-6 - sex unknown (DB-MW/R; USFWS# 211089606; banded 5.15.98)			
5.11-22.98	BNCY19	fledgling	LSA 1998b
1998-7 - sex unknown (W/R-MW; USFWS# 211089607; banded 5.15.98)			
5.11-22.98	BNCY19	fledgling	LSA 1998b
1998-8 - male (Y-MLG/Y; USFWS# 211089608; banded 5.15.98)			
3.27-7.7.98	BNCY19	fledged three young with 1997-20	LSA 1998b
1998-9 - sex unknown (DG-MW/R; USFWS# 211089609; banded 5.15.98)			
5.11-15.98	BNCY4	fledgling	LSA 1998b
1998-10 - female (W/R-MLG; USFWS# 211089610; banded 5.15.98)			
5.11-15.98	BNCY4	fledgling	LSA 1998b
4.20-7.2.99	Laidlaw Plant NROC #G-05-F3	nested (fate unknown) with UB male	LSA 1999
1998-11 - sex unknown (W/R-MLB; USFWS# 211089611; banded 5.15.98)			
5.11-15.98	BNCY4	fledgling	LSA 1998b

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1998-12 - sex unknown (O-MW/R; USFWS# 211089612; banded 5.15.98)			
4.27-6.5.98	BNCY7	fledgling/juvenile	LSA 1998b
1998-13 - sex unknown (O-MY/LG; USFWS# 211089613; banded 5.15.98)			
4.27-6.5.98	BNCY7	fledgling/juvenile	LSA 1998b
1998-14 - sex unknown (W/R-MO; USFWS# 211089614; banded 5.15.98)			
4.27-6.5.98	BNCY7	fledgling/juvenile	LSA 1998b
1998-15 - sex unknown (W-MW/R; USFWS# 211089615; banded 5.17.98)			
5.13-18.98	BNCY31	fledgling	LSA 1998b
1998-16 - female (O-MDB; USFWS# 211089616; banded 5.18.98)			
2.27-7.9.98	BNCY31	fledged 2-3 young with 1997-82	LSA 1998b
1.3-14.99	BNCY31/1	"paired" with 1999-38	LSA 1999
3.3-7.15.99	BNCY31/1	fledged 3-7 young from two broods with 1999-38	LSA 1999
9.20-21.99	BNCY1/31	paired with 1999-38	LSA 1999
3.2-8.1.00	BNCY31/1	nested unsuccessfully with 1999-38	this study
1998-17 - female (LG/Y-YM; USFWS# 211089617; banded 5.18.98)			
5.13-18.98	BNCY31	fledgling	LSA 1998b
10.30.98	SE of BNCY-B	"paired" with UB male	LSA 1998b
1998-18 - male (R-MLG/Y; USFWS# 211089618; banded 5.20.98)			
5.18-20.98	BNCY16	fledgling	LSA 1998b
10.21.98	UCI4/5	"paired" with UB female	LSA 1998b
1998-19 - sex unknown (B-MLG/Y; USFWS# 211089619; banded 5.20.98)			
5.18-20.98	BNCY16	fledgling	LSA 1998b
1998-20 - male (LB-MW/R; USFWS# 211089622; banded 5.22.98)			
1.4.98	BNCY25	(this bird?) paired with 1997-3	LSA 1998b
3.15-29.98	BNCY25	with 1997-3, female laid 4 eggs	LSA 1998b
5.16-22.98	BNCY25	fledged 3-4 young, apparently alone	LSA 1998b
7.8.98-1.3.99	BNCY25	"paired" with UB female	LSA 1998b, 1999
3.6-7.99	BNCY25	paired with UB female	LSA 1999
3.6-4.18.00	BNCY25	apparently nested unsuccessfully with UB female	this study
7.18.00	BNCY25	alone	this study
1998-21 - sex unknown (DB-MY/LG; USFWS# 211089623; banded 5.22.98)			
5.16-22.98	BNCY25	fledgling/juvenile	LSA 1998b
1998-22 - male (P-MW/R; USFWS# 211089624; banded 5.22.98)			
5.16-22.98	BNCY25	fledgling/juvenile	LSA 1998b
7.11.99	Coyote Canyon landfill (CCL3)	nested successfully with UB (later banded) female	LSA 1999
1998-23 - sex unknown (Y/LG-MP; USFWS# 211089625; banded 5.27.98)			
5.27.98	BNCY18	juvenile of unknown origin	LSA 1998b
6.19-7.17.98	BNCY7	juvenile	LSA 1998b
1998-24 - sex unknown (LG/Y-MLB; USFWS# 211089626; banded 5.28.98)			
5.18-28.98	BNCY15	nestling	LSA 1998b
1998-25 - sex unknown (Y/LG-MB; USFWS# 211089627; banded 5.28.98)			

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1998-26 - sex unknown (LG/Y-MDG; USFWS# 211089628; banded 5.28.98)	5.18-28.98 BNCY15	nestling	LSA 1998b
1998-27 - sex unknown (M-LG/YB; USFWS# 211089629; banded 5.28.98)	5.18-28.98 BNCY15	nestling	LSA 1998b
1998-28 - male (M-LG/YLB; USFWS# 211089630; banded 5.28.98)	5.18-28.98 BNCY15	nestling	LSA 1998b
	4.25.99 BNCY5	with 1997-70	LSA 1999
	3.1-7.15.00 BNCY7	nested unsuccessfully with UB female	this study
	6.12.00 BNCY35	pair visited this unoccupied territory	this study
1998-29 - male (MDG-W; USFWS# 211089635; banded 7.3.98)	7.3-10.98 BNCY18	fledgling	LSA 1998b
	8.29.98 BNCY18/26	juvenile	LSA 1998b
	8.27-10.7.99 San Joaquin Marsh Reserve	paired with UB female	LSA 1999
	spring 2000 San Joaquin Marsh Reserve	fledged two young with UB female	fide P.A. Bowler
1998-30 - female (MP-W; USFWS# 211089636; banded 7.3.98)	7.3-10.98 BNCY18	fledgling	LSA 1998b
	1.14.99 lower BNCY2	"alone"	LSA 1999
1998-31 - male (MR-R; USFWS# 211089637; banded 7.4.98)	3.27-7.4.98 BNCY6	fledged four young with 1997-24	LSA 1998b
	10.28.98 BNCY6	paired with 1997-24	LSA 1998b
1998-32 - sex unknown (PM-DG; USFWS# 211089638; banded 7.4.98)	7.4.98 BNCY6	fledgling	LSA 1998b
1998-33 - sex unknown (M-LGDG; USFWS# 211089639; banded 7.4.98)	7.4.98 BNCY6	fledgling	LSA 1998b
1998-34 - sex unknown (MDB-DG; USFWS# 211089640; banded 7.4.98)	7.4.98 BNCY6	fledgling	LSA 1998b
1998-35 - male (MDB-DB; USFWS# 211089641; banded 7.4.98)	7.4.98 BNCY6	fledgling	LSA 1998b
	1.3.99 BNCY13	paired with UB female	LSA 1999
	3.7-7.16.99 BNCY13	nested unsuccessfully with UB female	LSA 1999
	3.28-8.1.00 BNCY13	fledged 5-6 young from two broods with UB female	this study
	9.21.00 BNCY13	with UK female	this study
1998-36 - sex unknown (OM-P; USFWS# 211089642; banded 7.6.98)	6.19-7.25.98 BNCY23	fledgling/juvenile	LSA 1998b
1998-37 - sex unknown (WM-P; USFWS# 211089643; banded 7.6.98)	6.19-7.25.98 BNCY23	fledgling/juvenile	LSA 1998b
1998-38 - sex unknown (LGM-O; USFWS# 211089644; banded 7.6.98)	6.19-7.25.98 BNCY23	fledgling/juvenile	LSA 1998b
1998-39 - female (MDG-R; USFWS# 211089645; banded 7.6.98)	7.6-7.98 BNCY7	juvenile, not on natal territory	LSA 1998b
	10.29-11.30.98 BNCY32	"paired" with 1998-C	LSA 1998b

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information	
3.2-7.19.99	BNCY32	fledged 4-5 young from two broods with 1998-C	LSA 1999	
9.19.99	BNCY33	with 1998-C, 1997-23, and UB female	LSA 1999	
1998-40 - sex unknown (MDB-W; USFWS# 211089646; banded 7.7.98)	6.19.98	BNCY7	nestling	LSA 1998b
	6.27-7.25.98	BNCY7	fledgling/juvenile	LSA 1998b
1998-41 - sex unknown (MDG-LG; USFWS# 211089647; banded 7.7.98)	6.19.98	BNCY7	nestling	LSA 1998b
	6.27-7.25.98	BNCY7	fledgling/juvenile	LSA 1998b
1998-42 - sex unknown (LGM-LG; USFWS# 211089648; banded 7.9.98)	7.3-5.98	BNCY26	nestling	LSA 1998b
	7.9.98	BNCY26	fledgling	LSA 1998b
1998-43 - sex unknown (OM-LB; USFWS# 211089649; banded 7.9.98)	7.3-5.98	BNCY26	nestling	LSA 1998b
	7.9-26.98	BNCY26	fledgling	LSA 1998b
1998-44 - female (MP-Y; USFWS# 211089650; banded 7.9.98)	7.9.98	BNCY26	juvenile, not on natal territory	LSA 1998b
	9.29.98-1.14.98	BNCY11	paired with 1998-47	LSA 1998b, 1999
	3.1-5.25.99	BNCY11	fledged 1-3 young with 1998-47	LSA 1999
	6.6-7.15.99	BNCY11	nested unsuccessfully with UB male	LSA 1999
	9.19.99	BNCY11	with UB male	LSA 1999
	11.6.99	BNCY11	alone?	LSA 1999
	2.22-7.20.00	BNCY11	fledged 5+ young from two broods with 2000-22	this study
	9.24.00	BNCY11	with 2000-22	this study
1998-45 - male (MW-LB; USFWS# 211089651; banded 7.12.98)	3.29-7.12.98	BNCY17	fledged 2-3 young with 1998-46	LSA 1998b
	10.22.98-1.3.99	BNCY17	paired with 1998-46	LSA 1998b, 1999
	3.6-7.17.99	BNCY17(&BNCY12)	nested unsuccessfully with 1998-46	LSA 1999
1998-46 - female (YM-R; USFWS# 211089652; banded 7.12.98)	3.29-7.12.98	BNCY17	fledged 2-3 young with 1998-45	LSA 1998b
	10.22.98-1.3.99	BNCY17	paired with 1998-45	LSA 1998b, 1999
	3.6-7.17.99	BNCY17(&BNCY12)	nested unsuccessfully with 1998-45	LSA 1999
1998-47 - male (MDB-Y; USFWS# 211089653; banded 7.12.98)	7.11-12.98	BNCY17	fledgling	LSA 1998b
	9.29.98-1.14.99	BNCY11	paired with 1998-44	LSA 1998b, 1999
	3.1-5.19.99	BNCY11	fledged 1-3 young with 1998-44	LSA 1999
1998-48 - sex unknown (MLG-LG; USFWS# 211089654; banded 7.12.98)	7.11-12.98	BNCY17	fledgling	LSA 1998b
1998-A - male (M-LG/YR; USFWS# 206019593; banded 5.24.97)				

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
5.24.97	Turtle Rock Fragments 6	nestling	LSA 1998b
1.4.98	BNCY19	"paired" with 1997-20	LSA 1998b
April-July 98	UCI7S	fledged five young from two broods with UB female	LSA 1998b
10.21.98	UCI7N	"paired" with UB female	LSA 1998b
1998-B - male (M-RW/R; USFWS# 205012278; banded 5.6.98)			
5.6.98	UCI3/8	nestling	LSA 1998b
7.3.98	BNCY18	juvenile	LSA 1998b
7.7.98	BNCY5	juvenile	LSA 1998b
7.8.98	BNCY18	juvenile with UB juvenile	LSA 1998b
7.11.98	BNCY2	juvenile	LSA 1998b
7.12.98	BNCY4	juvenile	LSA 1998b
11.30.98	BNCY19	"paired" with UB female	LSA 1998b
1.3.99	BNCY19	"paired" with 1997-20	LSA 1999
3.2-7.15.99	BNCY19	fledged three young with 1997-20	LSA 1999
3.7-6.23.00	BNCY19	fledged four young with 1997-20	this study
7.4-9.24.00	BNCY19	with 1997-20	this study
1998-C - male (DB-MLG/Y; USFWS# 211089531; banded 6.10.98)			
6.10.98	Crystal Cove Bluffs (CCB8E)	nestling	LSA 1998b
10.29.98	BNCY32	(probably this male) "paired" with 1998-39	LSA 1998b
11.30.98	BNCY32	"paired" with 1998-39	LSA 1998b
3.2-7.19.99	BNCY32	fledged 4-6 young from two broods with 1998-39	LSA 1999
9.19.99	BNCY33	with 1998-39, 1997-23, and UB female	LSA 1999
3.1-6.21.00	BNCY32	fledged four young with 1998-39	this study
7.4-9.23.00	BNCY32	with 1998-39	this study
1998-D - male (W/R-MY/LG; USFWS# 210028922; banded 7.23.98)			
7.23.98	UCI6	nestling	LSA 1998b
11.30.98	between BNCY2, BNCY3, and BNCY5	apparently alone	LSA 1998b
1.3.99	lower BNCY2	"paired" with UB female	LSA 1999
3.23-7.17.99	BNCY18N	fledged two young with UB female	LSA 1999
7.27.99	upper BNCY2/18	with banded female/juv. (combo unk)	LSA 1999
9.19.99	upper BNCY2/18	with two UB females	LSA 1999
9.20.99	BNCY18/26	alone	LSA 1999
11.6-12.3.99	lower BNCY2 and adjacent mulefat	with 1997-70	LSA 1999
2.22.00	below BNCY2	alone	this study
3.6-5.19.00	BNCY2	raised 3-4 young with 1996-28	this study
6.11-11.3.00	BNCY2	with UB female	this study
1999-1 - sex unknown (OM-R; USFWS# 210029001; banded 4.27.99)			
4.24-27.99	BNCY6	nestling	LSA 1999
5.19.99	BNCY6	fledgling	LSA 1999

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1999-2 - sex unknown (LGM-DG; USFWS# 210029002; banded 4.27.99)			
4.24-27.99	BNCY6	nestling	LSA 1999
1999-3 - sex unknown (DBM-LB; USFWS# 210029003; banded 4.27.99)			
4.24-27.99	BNCY6	nestling	LSA 1999
5.19.99	BNCY6	fledgling	LSA 1999
1999-4 - sex unknown (M-R/WY/LG; USFWS# 210028926; banded 5.16.99)			
5.14-16.99	BNCY2	nestling	LSA 1999
5.25-6.10.99	BNCY2	fledgling/juvenile	LSA 1999
9.19.99	BNCY7	"with" 4-5 other birds	LSA 1999
1999-5 - male (M-R/WW/R; USFWS# 210028927; banded 5.16.99)			
5.14-16.99	BNCY2	nestling	LSA 1999
5.25-6.10.99	BNCY2	fledgling/juvenile	LSA 1999
7.9-9.20.99	BNCY26	dispersed juvenile	LSA 1999
11.6.99	BNCY26	with 1999-11	LSA 1999
1999-6 - sex unknown (MLG/Y-LB; USFWS# 210028928; banded 5.16.99)			
5.14-16.99	BNCY2	nestling	LSA 1999
5.25-6.10.99	BNCY2	fledgling/juvenile	LSA 1999
1999-7 - sex unknown (MLG/Y-LG/Y; USFWS# 210028924; banded 5.16.99)			
5.14.99	BNCY16	nestling	LSA 1999
5.16-6.8.99	BNCY16	fledgling/juvenile	LSA 1999
7.9.99	BNCY26	dispersed juvenile	LSA 1999
1999-8 - sex unknown (MLB-P; USFWS# 210028929; banded 5.17.99)			
5.14-19.99	BNCY11	nestling	LSA 1999
5.25.99	BNCY11	fledgling	LSA 1999
1999-9 - sex unknown (MR/W-LG/Y; USFWS# 210028930; banded 5.17.99)			
5.14-19.99	BNCY11	nestling	LSA 1999
1999-10 - sex unknown (W/R-OM; USFWS# 210028931; banded 5.17.99)			
5.14-19.99	BNCY11	nestling	LSA 1999
1999-11 - female (MDG-Y; USFWS# 210028932; banded 5.17.99)			
5.14-17.99	BNCY19	nestling	LSA 1999
5.24-6.10.99	BNCY19	fledgling/juvenile	LSA 1999
7.9.99	BNCY26	dispersed juvenile	LSA 1999
11.6.99	BNCY26	with 1999-5	LSA 1999
12.3.99	adjacent BNCY26	with UK male	LSA 1999
2.22.00	BNCY26	alone	this study
3.2-7.16.00	BNCY26/18/20	fledged 3-4 young with 2000-26	this study
8.31-11.22.00	BNCY26	paired with 2000-26	this study
1999-12 - sex unknown (MO-LG; USFWS# 210028933; banded 5.17.99)			
5.14-17.99	BNCY19	nestling	LSA 1999
5.24-6.10.99	BNCY19	fledgling/juvenile	LSA 1999
7.18.99	Coyote Canyon landfill (CCL11)	dispersed juvenile	LSA 1999
1999-13 - sex unknown (MY/LG-LG/Y; USFWS# 210028934; banded 5.17.99)			
5.14-17.99	BNCY19	nestling	LSA 1999
5.24-6.10.99	BNCY19	fledgling/juvenile	LSA 1999

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
7.8.99	BNCY2	dispersed juvenile	LSA 1999
1999-14 - male (YDB-M; USFWS# 210029004; banded 6.7.99)			
5.25-6.7.99	BNCY26/18S	fledgling	LSA 1999
6.24.99	BNCY18S	juvenile	LSA 1999
3.1.00	BNCY36	with UB female	this study
1999-15 - sex unknown (YM-LG; USFWS# 210029005; banded 6.9.99)			
6.6-12.99	BNCY7	nestling	LSA 1999
6.17-7.8.99	BNCY7	fledgling/juvenile	LSA 1999
1999-16 - sex unknown (WM-O; USFWS# 210029006; banded 6.9.99)			
6.6-12.99	BNCY7	nestling	LSA 1999
6.17-24.99	BNCY7	fledgling	LSA 1999
7.15.99	BNCY3	dispersed juvenile	LSA 1999
1999-17 - female (LGM-Y; USFWS# 210029008; banded 6.11.99)			
6.8-7.13.99	BNCY25	fledged four young with 1999-22	LSA 1999
1999-18 - sex unknown (DBM-LG; USFWS# 210029009; banded 6.11.99)			
6.8-11.99	BNCY25	fledgling	LSA 1999
1999-19 - sex unknown (DGM-P; USFWS# 210029010; banded 6.11.99)			
6.8-11.99	BNCY25	fledgling	LSA 1999
1999-20 - sex unknown (RM-W; USFWS# 210029011; banded 6.11.99)			
6.8-11.99	BNCY25	fledgling	LSA 1999
1999-21 - sex unknown (WM-DB; USFWS# 210029012; banded 6.11.99)			
6.8-11.99	BNCY25	fledgling	LSA 1999
1999-22 - male (RM-LB; USFWS# 210029013; banded 6.11.99)			
6.8-7.13.99	BNCY25	fledged four young with 1999-17	LSA 1999
1.12.00	BNCY37	with UB female	this study
4.6-8.8.00	BNCY37	fledged four young with UB female	this study
6.23.00	BNCY25	alone?	this study
9.21.00	BNCY25	with UB female	this study
1999-23 - sex unknown (DGM-O; USFWS# 210029014; banded 6.14.99)			
5.19-5.25.99	BNCY14	nestling	LSA 1999
6.7-14.99	lower BNCY-B	fledgling	LSA 1999
7.7.99	lower BNCY-B	juvenile	LSA 1999
1999-24 - male (PM-Y; USFWS# 210029015; banded 6.14.99)			
5.19-5.25.99	BNCY14	nestling	LSA 1999
6.7-14.99	lower BNCY-B	fledgling	LSA 1999
8.6.99	Coyote Canyon landfill (CCL9/10)	dispersed juvenile	LSA 1999
8.22-29.00	CCL5	with YM-P	D. Kamada
1999-25 - sex unknown (YM-W; USFWS# 210029016; banded 6.14.99)			
5.19-5.25.99	BNCY14	nestling	LSA 1999
6.7-14.99	lower BNCY-B	fledgling	LSA 1999
1999-26 - male (RM-R; USFWS# 210029017; banded 6.14.99)			
5.6-6.14.99	BNCY14	fledged 3-4 young with UB female	LSA 1999
6.21.00	Coyote Canyon landfill (CCL13)	fledged 5 young with banded female (RM-P; not 2000-18)	A. Wolf

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
8.22-29.00	CCL13	present with banded female (RM-P)	A. Wolf
1999-27 - sex unknown (WM-LG; USFWS# 210029018; banded 6.15.99)			
6.9-15.99	BNCY23/33	nestling	LSA 1999
6.24.99	BNCY23/33	fledgling	LSA 1999
1999-28 - sex unknown (RM-DG; USFWS# 210029019; banded 6.15.99)			
6.9-15.99	BNCY23/33	nestling	LSA 1999
6.24-7.12.99	BNCY23/33	fledgling/juvenile	LSA 1999
1999-29 - sex unknown (LBM-P; USFWS# 210029020; banded 6.15.99)			
6.9-15.99	BNCY23/33	nestling	LSA 1999
6.24.99	BNCY23/33	fledgling	LSA 1999
1999-30 - sex unknown (DGM-W; USFWS# 210029021; banded 6.15.99)			
6.9-15.99	BNCY23/33	nestling	LSA 1999
6.24.99	BNCY23/33	fledgling	LSA 1999
1999-31 - sex unknown (PM-P; USFWS# 210029023; banded 6.16.99)			
6.9-16.99	BNCY18N	nestling	LSA 1999
6.24-7.17.99	BNCY18N	fledgling/juvenile	LSA 1999
7.27.99	lower BNCY2	dispersed juvenile	LSA 1999
1999-32 - sex unknown (WM-LB; USFWS# 210029024; banded 6.16.99)			
6.9-16.99	BNCY18N	nestling	LSA 1999
6.24-7.17.99	BNCY18N	fledgling/juvenile	LSA 1999
1999-33 - sex unknown (OM-W; USFWS# 210029028; banded 6.17.99)			
6.10-17.99	BNCY13	nestling	LSA 1999
1999-34 - female (OM-Y; USFWS# 210029041; banded 7.12.99)			
1.3.99	BNCY30	"paired" with 1999-35 (presumably these birds)	LSA 1999
3.4-7.12.99	BNCY30	nested unsuccessfully with 1999-35	LSA 1999
4.5-7.18.00	BNCY30	fledged 2+ young with 1999-35	this study
7.25-8.1.00	BNCY30/38	with UB male	this study
1999-35 - male (RM-LG; USFWS# 210029042; banded 7.12.99)			
1.3.99	BNCY30	"paired" with 1999-34 (presumably these birds)	LSA 1999
3.4-7.12.99	BNCY30	nested unsuccessfully with 1999-34	LSA 1999
4.5-7.18.00	BNCY30	fledged 2+ young with 1999-34	this study
1999-36 - sex unknown (LBM-Y; USFWS# 210029043; banded 7.12.99)			
7.8-12.99	BNCY32	nestling	LSA 1999
7.19.99	BNCY32	fledgling	LSA 1999
1999-37 - sex unknown (PM-O; USFWS# 210029044; banded 7.12.99)			
7.8-12.99	BNCY32	nestling	LSA 1999
7.19.99	BNCY32	fledgling	LSA 1999
1999-38 - male (RY-M; USFWS# 210029058; banded 7.15.99)			
1.3-14.99	BNCY31/1	paired with 1998-16	LSA 1999
3.3-7.15.99	BNCY31/1	fledged 3-7 young from two broods with 1998-16	LSA 1999
9.20-21.99	BNCY1/31	paired with 1998-16	LSA 1999
3.2-8.1.00	BNCY31/1	nested unsuccessfully with 1998-16	this study

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
1999-39 - sex unknown (M-WDB; USFWS# 210029059; banded 7.15.99)			
7.7.99	BNCY31/1	nestling	LSA 1999
7.15.99	BNCY31/1	fledgling	LSA 1999
1999-40 - sex unknown (M-DBY; USFWS# 210029060; banded 7.15.99)			
7.7-15.99	BNCY6	dependent young	LSA 1999
1999-41 - sex unknown (LGP-M; USFWS# 210029061; banded 7.15.99)			
7.7-15.99	BNCY6	dependent young	LSA 1999
1999-42 - sex unknown (RW-M; USFWS# 210029062; banded 7.15.99)			
7.7-15.99	BNCY6	dependent young	LSA 1999
1999-43 - sex unknown (M-WO; USFWS# 210029073; banded 7.20.99)			
7.15-20.99	BNCY26/18S	nestling	LSA 1999
7.27.99	BNCY26/18S	fledgling	LSA 1999
1999-44 - sex unknown (M-OP; USFWS# 210029074; banded 7.20.99)			
7.15-20.99	BNCY26/18S	nestling	LSA 1999
7.27.99	BNCY26/18S	fledgling	LSA 1999
1999-45 - sex unknown (M-LBP; USFWS# 210029075; banded 7.20.99)			
7.15-20.99	BNCY26/18S	nestling	LSA 1999
7.27.99	BNCY26/18S	fledgling	LSA 1999
1999-A - male (Y-MWR; USFWS# 211089597; banded 7.7.98)			
7.7.98	Sand Canyon Reservoir (SCR23)	nestling	LSA 1998b
1.3.99	BNCY6	"paired" with UB female	LSA 1999
3.2-7.15.99	BNCY6	fledged 6-7 young from two broods with 1997-24	LSA 1999
3.2-6.18.00	BNCY6	fledged 3+ young with 1997-24	this study
7.4.00	BNCY6	apparently alone	this study
7.16.00	BNCY6	"paired" with 2000-6	this study
1999-B - female (M-W/R/Y/LG; USFWS# 211089595; banded 7.3.98)			
7.3.98	Sand Canyon Res. (SCR17N/23)	nestling	LSA 1999
4.24.99	BNCY23	with UB male	LSA 1999
4.28.99	BNCY-C	with UB male	LSA 1999
1999-C - sex unknown (MO-P; USFWS# 210028949; banded 6.8.99)			
5.24-6.23.99	UCI6	fledgling/juvenile	LSA 1999
7.9.99	BNCY26	dispersed juvenile	LSA 1999
7.11.99	BNCY2	dispersed juvenile	LSA 1999
7.17.99	BNCY26	dispersed juvenile	LSA 1999
7.27.99	upper BNCY2/11	with banded male (1997-79?)	LSA 1999
1999-D - sex unknown (M-YO; USFWS# 210028947; banded 5.25.99)			
5.25-31.99	UCI4	nestling	LSA 1999
5.31-6.23.99	UCI4	fledgling/juvenile	LSA 1999
7.10.99	BNCY19	dispersed juvenile	LSA 1999
1999-E - sex unknown (M-RO; USFWS# 210028961; banded 7.20.99)			
7.20.99	Crystal Cove (CCB9)	nestling	LSA 1999

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information	
	8.18.99	Crystal Cove (CCB9)	fledgling/juvenile	LSA 1999
	9.19.99	BNCY7	dispersed juvenile	LSA 1999
1999-F - female (LG/Y-MO; USFWS# 210028911; banded 6.15.98)				
	6.15.98	Upper Newport Bay, east side (NBB5)	nestling	LSA 1999
	spring/summer 1999	Upper Newport Bay, west side (NBB11)	on territory with UB male	LSA 1999
	10.18.99	Upper Newport Bay, west side (NBB11)	paired with UB male	LSA 1999
1999-G - female (W/R-BM; USFWS# 210028916; banded 7.7.98)				
	7.7.98	UCI3/8	nestling	LSA 1999
	spring 1999	Upper Newport Bay, east side (NBB1)	present	LSA 1999
	10.20.99	Upper Newport Bay, east side (NBB1)	with UB male	LSA 1999
1999-H - male (R-LG/YM; USFWS# 210028906; banded 6.11.98)				
	6.11.98	Upper Newport Bay, east side (NBB1)	nestling	LSA 1999
	11.1.99	Upper Newport Bay, east side (NBB1S)	alone	LSA 1999
	12.10.99	Upper Newport Bay, east side (NBB1S)	with UB female	LSA 1999
2000-1 - male (MP-LB; USFWS# 211099292; banded 5.17.00)				
	5.16-6.13.00	BNCY36	fledged 2+ young with 2000-2	this study
	7.4-9.23.00	BNCY36	paired with 2000-2; also visited BNCY30	this study
2000-2 - female (M-WW; USFWS# 211099293; banded 5.17.00)				
	5.16-6.13.00	BNCY36	fledged 2+ young with 2000-1	this study
	7.4-9.23.00	BNCY36	paired with 2000-1; also visited BNCY30	this study
2000-3 - sex unknown (MLG-DG; USFWS# 211099294; banded 5.17.00)				
	5.16-6.12.00	BNCY36	dependent young	this study
2000-4 - sex unknown (MP-P; USFWS# 211099295; banded 5.19.00)				
	4.18-19.00	BNCY23	nestling	this study
	4.28-5.19.00	BNCY23	dependent young	this study
	6.11.00	BNCY26	dispersing juvenile	this study
2000-5 - male (YY-M; USFWS# 211099296; banded 5.19.00)				
	3.1-7.18.00	BNCY23/33	fledged four young with 1997-23	this study
	9.23.00	BNCY23	with UB female	this study
2000-6 - female (M-BDG; USFWS# 211099297; banded 5.19.00)				
	4.18-19.00	BNCY23	nestling	this study
	4.28-5.19.00	BNCY23	dependent young	this study
	7.16.00	BNCY6	"paired" with 1999-A	this study
	7.17.00	BNCY6	alone	this study
	9.23.00	BNCY6	"paired" with 2000-21	this study
2000-7 - sex unknown (M-WLB; USFWS# 211099298; banded 5.19.00)				
	4.18-19.00	BNCY23	nestling	this study

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
4.28-5.19.00	BNCY23	dependent young	this study
2000-8 - sex unknown (M-RW; USFWS# 211099299; banded 5.19.00)			
4.18-19.00	BNCY23	nestling	this study
4.28-5.19.00	BNCY23	dependent young	this study
2000-9 - sex unknown (M-LBR; USFWS# 211099300; banded 5.19.00)			
4.27-28.00	BNCY4	nestling	this study
5.1-19.00	BNCY4	dependent young	this study
2000-10 - sex unknown (M-WR; USFWS# 351054201; banded 5.19.00)			
4.27-28.00	BNCY4	nestling	this study
5.1-19.00	BNCY4	dependent young	this study
6.11.00	BNCY7	dispersed juvenile	this study
6.12-19.00	BNCY23/32	dispersed juvenile	this study
7.4.00	BNCY35	M-R present; apparently this bird minus its white band	this study
7.15.00	BNCY7	M-R present	this study
2000-11 - sex unknown (M-PY; USFWS# 351054202; banded 5.19.00)			
4.27-28.00	BNCY4	nestling	this study
5.1-19.00	BNCY4	dependent young	this study
6.4.00	BNCY23	dispersed juvenile	this study
6.21-7.16.00	BNCY18/26	dispersed juvenile	this study
2000-12 - sex unknown (W/R-W/RM; USFWS# 351054203; banded 5.19.00)			
5.12-21.00	BNCY19	nestling	this study
5.29-6.18.00	BNCY19	dependent young	this study
7.16.00	BNCY18/26	dispersed juvenile	this study
2000-13 - sex unknown (MLB-O; USFWS# 351054204; banded 5.19.00)			
5.12-21.00	BNCY19	nestling	this study
5.29-6.18.00	BNCY19	dependent young	this study
7.20.00	BNCY11	dispersed juvenile	this study
2000-14 - male (MLB-DB; USFWS# 351054205; banded 5.19.00)			
5.12-21.00	BNCY19	nestling	this study
5.29-6.18.00	BNCY19	dependent young	this study
7.19-20.00	BNCY11	dispersed juvenile	this study
9.23.00	BNCY7	dispersed juvenile	this study
2000-15 - sex unknown (BM-P; USFWS# 351054206; banded 5.19.00)			
5.12-21.00	BNCY19	nestling	this study
5.29-6.4.00	BNCY19	dependent young	this study
2000-16 - sex unknown (MR-LB; USFWS# 351054207; banded 6.14.00)			
6.13-14.00	BNCY15	fledgling	this study
2000-17 - sex unknown (MY-DG; USFWS# 351054208; banded 6.14.00)			
6.13-14.00	BNCY15	fledgling	this study
2000-18 - sex unknown (RM-P; USFWS# 351054209; banded 6.14.00)			
6.13-14.00	BNCY15	fledgling	this study
2000-19 - female (MO-O; USFWS# 351054210; banded 6.14.00)			
3.6-6.14.00	BNCY15	fledged four young with 1997-6	this study
2000-20 - sex unknown (MLB-DG; USFWS# 351054211; banded 6.14.00)			

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
6.13-14.00	BNCY15	fledgling	this study
2000-21 - male (DBM-DB; USFWS# 351054212; banded 6.15.00)			
6.15.00	BNCY11	juvenile	this study
9.23.00	BNCY6	"paired" with 2000-6	this study
2000-22 - male (M-LBLG; USFWS# 351054213; banded 6.15.00)			
2.22-7.20.00	BNCY11	fledged 5+ young from two broods with 1998-44	this study
9.24.00	BNCY11	paired with 1998-44	this study
2000-23 - sex unknown (MP-O; USFWS# 351054214; banded 6.20.00)			
6.11-20.00	BNCY18	nestling	this study
6.25-7.16.00	BNCY18	dependent young	this study
7.17.00	BNCY18/2	juvenile	this study
2000-24 - sex unknown (DBM-O; USFWS# 351054215; banded 6.20.00)			
6.11-20.00	BNCY18	nestling	this study
6.25-7.16.00	BNCY18	dependent young	this study
7.17.00	BNCY18/2	juvenile	this study
8.22-29.00	Coyote Canyon Landfill (CCL14)	dispersed juvenile	this study
2000-25 - sex unknown (M-YW; USFWS# 351054216; banded 6.20.00)			
6.11-20.00	BNCY18	nestling	this study
6.25-7.16.00	BNCY18	dependent young	this study
2000-26 - male (M-RR; USFWS# 351054217; banded 6.25.00)			
3.2-7.16.00	BNCY26/18/20	fledged 3-4 young with 1999-11	this study
8.31-11.22.00	BNCY26	paired with 1999-11	this study
2000-27 - sex unknown (MLG-P; USFWS# 351054218; banded 6.25.00)			
6.23-7.16.00	BNCY26	dependent young	this study
2000-28 - sex unknown (MR-DB; USFWS# 351054219; banded 6.25.00)			
6.23-7.16.00	BNCY26	dependent young	this study
2000-29 - sex unknown (YO-M; USFWS# 351054220; banded 6.25.00)			
6.23-7.16.00	BNCY26	dependent young	this study
2000-30 - sex unknown (MLB-LG; USFWS# 351054221; banded 7.20.00)			
7.16-20.00	BNCY13	nestling	this study
8.1.00	BNCY13	fledgling	this study
2000-31 - male (MP-R; USFWS# 351054222; banded 7.20.00)			
7.16-20.00	BNCY13	nestling	this study
8.1.00	BNCY13	fledgling	this study
9.22.00	UCI7N	dispersed juvenile	this study
2000-32 - sex unknown (M-LBLB; USFWS# 351054223; banded 7.20.00)			
7.15-20.00	BNCY11	dependent young	this study
2000-33 - male (M-OR; USFWS# 351054224; banded 7.20.00)			
7.20.00	BNCY11	juvenile	this study
2000-A - sex unknown (W/R-LGM; USFWS# 211089587; banded 5.5.00)			
4.28-5.9.00	BNCY38	nestling	D. Kamada
5.12-15.00	BNCY38	dependent young	D. Kamada
2000-B - sex unknown (MW/R-DG; USFWS# 211089588; banded 5.5.00)			

Individual ¹ , Sex, Banding Data, Date(s) Observed	Location	Notes	Source of Information
4.28-5.9.00	BNCY38	nestling	D. Kamada
5.12-15.00	BNCY38	dependent young	D. Kamada
2000-C - sex unknown (MY/LG-P; USFWS# 211089589; banded 5.5.00)			
4.28-5.9.00	BNCY38	nestling	D. Kamada
5.12-6.4.00	BNCY38	dependent young	D. Kamada
2000-D - sex unknown (M-PDG; USFWS# 211089590; banded 5.5.00)			
4.28-5.9.00	BNCY38	nestling	D. Kamada
5.12-6.4.00	BNCY38	dependent young	D. Kamada
2000-E - sex unknown (W/R-Y/LGM; USFWS# 211089577; banded 5.9.00)			
5.2-9.00	BNCY37	nestling	D. Kamada
5.15-6.6.00	BNCY37	dependent young	D. Kamada
2000-F - sex unknown (RLG/Y-M; USFWS# 211089591; banded 5.9.00)			
5.2-9.00	BNCY37	nestling	D. Kamada
5.15-6.6.00	BNCY37	dependent young	D. Kamada
2000-G - sex unknown (Y/LG-LG/YM; USFWS# 211089592; banded 5.9.00)			
5.2-9.00	BNCY37	nestling	D. Kamada
5.15-6.6.00	BNCY37	dependent young	D. Kamada
2000-H - sex unknown (Y/LG-MDB; USFWS# 211089593; banded 5.9.00)			
5.2-9.00	BNCY37	nestling	D. Kamada
5.15-6.6.00	BNCY37	dependent young	D. Kamada

1. Numbers assigned here are for use in this document only and should not be used outside of the confines of this study. Most of the 1996 numbers were changed from those used by LSA (1997), to match the numbering system used in subsequent years.

APPENDIX G

CHRONOLOGY OF LEAST BELL'S VIREO ACTIVITY 1996-2000

**CHRONOLOGY OF LEAST BELL'S VIREO ACTIVITY IN THE
BONITA CANYON ROAD STUDY AREA, 1997-2000**

		Observer(s)
1997		
4.5	one singing male in Bonita Reservoir	RAE
4.14	one UB male singing in Bonita Reservoir	RAE
5.1	UB pair foraging together (male singing) in Bonita Reservoir UB male singing along the creek adjacent the Pelican Hill Road mitigation site	RAE
5.2	UB male singing along the creek adjacent the Pelican Hill Road mitigation site	RAE
5.4	UB male singing along the creek adjacent the Pelican Hill Road mitigation site	RAE
5.16	UB male singing calmly along the stream in Bonita Reservoir; female on N? UB male singing downstream from the above location, now at CaGn territory BNCY1	RAE
6.9	two UB males countersinging in the reservoir; no indication of female presence	RAE
6.28	UB "original" male singing as usual; no evidence of other birds	RAE
1998		
3.30	UB pair (male singing) in Bonita Reservoir	RAE
4.20	UB pair (male singing) in Bonita Reservoir	RAE
5.11	male singing in Bonita Reservoir	DRB
5.16	male singing in Bonita Reservoir	DRB
5.22	UB pair nest building (lining) in Bonita Reservoir	RAE
5.23	male singing in Bonita Reservoir	DRB
5.24	male singing in Bonita Reservoir	DRB
5.29	male singing in Bonita Reservoir	DRB
6.24	UB pair at new N/4EE in Bonita Reservoir	RAE
7.3	male singing in Bonita Reservoir	DRB
7.5	male singing upstream from Bonita Canyon Road, and into the wetland mitigation site; presumed to be the same male from across the road	DRB
7.15	male singing upstream from Bonita Canyon Road again, no singing heard in Bonita Reservoir at the same time	DRB

		Observer(s)
1999		
April – June	none found	DRB, RAE
7.15	male singing in Bonita Reservoir adjacent to BNCY6	DRB
2000		
4.17	UB male singing near BNCY6	DRB
4.28	UB male singing near BNCY6	RAE
5.7	pair tending N/EE or YY in <i>Toxicodendron</i>	RAE
5.15	female brooding/incubating on N in <i>Toxicodendron</i> , male singing nearby	RAE
5.21	pair tending N/YY (small) in <i>Toxicodendron</i>	RAE
5.29	pair tending N/3YY (8-10 days old?) in <i>Toxicodendron</i>	RAE
6.4	pair feeding fledglings	Adrian Wolf
6.7	N on the ground; no birds observed	RAE
6.13	pair tending (3?) fledglings	RAE
6.23	male NB in <i>Salix</i>	RAE
7.4	male at new N/1E in <i>B. salicifolia</i>	RAE
7.17	N/3EE in <i>B. salicifolia</i> ; male singing nearby	RAE
8.1	N failed (empty, except for ants); adults not found	RAE
8.31	male singing near BNCY26	RAE

APPENDIX H

**ANIMAL SPECIES OBSERVED IN THE BONITA CANYON ROAD
STUDY AREA 1996-2000**

ANIMAL SPECIES OBSERVED IN THE BONITA CANYON ROAD STUDY AREA, 1996-2000

This is a list of the butterflies and vertebrates noted in the study area by LSA biologists in 2000. Presence may be noted if a species is seen or heard, or identified by the presence of tracks, scat or other signs.

* Introduced species

LEPIDOPTERA

Papilionidae

Papilio rutulus

Pieridae

* *Pieris rapae*

Pieris protodice

Anthocharis sara

Nymphalidae

Danaus gilippus

Danaus plexippus

Coenonympha tullia

Vanessa cardui

Nymphalis antiopa

Precis coenia

Limnitis lorquini

Lycaenidae

Apodemia mormo

Calephelis nemesis

Strymon melinus pudica

Brephidium exilis

Leptotes marina

Glaucopsyche lygdamus

Euphilotes bernardino

Hesperiidae

Hylephila phyleus

Polites sabuleti

BUTTERFLIES

Swallowtails

Western tiger swallowtail

Whites, Orangetips, and Sulphurs

Cabbage butterfly

Common white

Sara orangetip

Brush-footed Butterflies

Queen

Monarch

California ringlet

Painted lady

Mourning cloak

Buckeye

Lorquin's admiral

Metalmarks, Hairstreaks, Coppers, and Blues

Mormon metalmark

Dusky metalmark

Common hairstreak

Western pygmy blue

Marine blue

Southern blue

San Bernardino blue

True Skippers

Fiery skipper

Sandhill skipper

AMPHIBIA

Plethodontidae

Batrachoceps pacificus

Hylidae

Hyla regilla

Bufo

Bufo boreas

REPTILIA

Emydidae

Clemmys marmorata pallida

Iguanidae

Sceloporus occidentalis

Anguillidae

Gerrhonotus multicarinatus

AVES

Ardeidae

Ardea herodias

Ardea alba

Egretta thula

Butorides striatus

Cathartidae

Cathartes aura

Anatidae

Anas platyrhynchos

Anas cyanoptera

Anas crecca

Accipitridae

Pandion haliaetus

Elanus leucurus

Circus cyaneus

Accipiter striatus

AMPHIBIANS

Lungless Salamanders

Pacific slender salamander

Treefrogs

Pacific treefrog

True Toads

Western toad

REPTILES

Box and Water Turtles

Southwestern pond turtle

Iguanid Lizards

Western fence lizard

Alligator Lizards

Southern alligator lizard

BIRDS

Hérons

Great blue heron

Great egret

Snowy egret

Green heron

New World Vultures

Turkey vulture

Swans, Geese, and Ducks

Mallard

Cinnamon teal

Green-winged teal

Kites, Hawks, Eagles, and Ospreys

Osprey

White-tailed kite

Northern harrier

Sharp-shinned hawk

<i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo lineatus</i>	Red-shouldered hawk
<i>Buteo jamaicensis</i>	Red-tailed hawk
Falconidae	Falcons
<i>Falco sparverius</i>	American kestrel
Phasianidae	Partridges and Allies
<i>Callipepla californica</i>	California quail
Rallidae	Rails and Gallinules
<i>Rallus limicola</i>	Viginia rail
<i>Porzana carolina</i>	Sora
<i>Fulica americana</i>	American coot
Charadriidae	Plovers and Lapwings
<i>Charadrius semipalmatus</i>	Semipalmated Plover
<i>Charadrius vociferus</i>	Killdeer
Scolopacidae	Sandpipers and Phalaropes
<i>Tringa melanoleuca</i>	Greater yellowlegs
<i>Numenius hudsonicus</i>	Whimbrel
<i>Calidris minutilla</i>	Least sandpiper
<i>Gallinago gallinago</i>	Common snipe
Laridae	Jaegers, Gulls, and Terns
<i>Larus delawarensis</i>	Ring-billed gull
<i>Larus californicus</i>	California gull
<i>Sterna forsteri</i>	Forster's tern
Columbidae	Pigeons and Doves
* <i>Columba livia</i>	Rock dove
<i>Zenaida macroura</i>	Mourning dove
Cuculidae	Cuckoos and Roadrunners
<i>Geococcyx californianus</i>	Greater roadrunner
Strigidae	Typical Owls
<i>Bubo virginianus</i>	Great horned owl
Apodidae	Swifts
<i>Aeronautes saxatilis</i>	White-throated swift

Trochilidae

Archilochus alexandri
Calypte anna
Selasphorus sasin

Alcedinidae

Ceryle torquata

Picidae

Picoides nuttallii
Picoides pubescens
Colaptes auratus

Tyrannidae

Contopus sodidulus
Empidonax traillii
Empidonax hamondii
Empidonax difficilis
Sayornis nigricans
Sayornis saya
Myiarchus cinerascens
Tyrannus vociferans
Tyrannus verticalis

Vireonidae

Vireo bellii pusillus
Vireo cassinii
Vireo huttoni
Vireo gilvus

Corvidae

Aphelocoma californica
Corvus brachyrhynchos
Corvus corax

Alaudidae

Eremophila alpestris

Hirundinidae

Stelgidopteryx serripennis
Hirundo pyrrhonota
Hirundo rustica

Aegithalidae

Psaltriparus minimus

Hummingbirds

Black-chinned hummingbird
Anna's hummingbird
Allen's hummingbird

Kingfishers

Belted kingfisher

Woodpeckers

Nuttall's woodpecker
Downy woodpecker
Northern flicker

Tyrant Flycatchers

Western wood-pewee
Willow flycatcher
Hammond's flycatcher
Pacific-slope flycatcher
Black phoebe
Say's phoebe
Ash-throated flycatcher
Cassin's kingbird
Western kingbird

Vireos

Least Bell's vireo
Cassin's vireo
Hutton's vireo
Warbling vireo

Jays, Magpies, and Crows

Western scrub-jay
American crow
Common raven

Larks

Horned lark

Swallows

N. rough-winged swallow
Cliff swallow
Barn swallow

Bushtits

Bushtit

Troglodytidae

Campylorhynchus brunneicapillus
Thryomanes bewickii
Troglodytes aedon
Cistothorus palustris

Sylviidae

Polioptila caerulea
Polioptila californica californica

Regulidae

Regulus calendula

Turdidae

Catharus ustulatus
Catharus guttatus
Turdus migratorius

Timaliidae

Chamaea fasciata

Mimidae

Mimus polyglottos
Toxostoma redivivum

Sturnidae

* *Sturnus vulgaris*

Motacillidae

Anthus rubescens

Ptilonotidae

Phainopepla nitens

Parulidae

Vermivora celata
Dendroica petechia
Dendroica coronata
Dendroica townsendi
Dendroica occidentalis
Seiurus noveboracensis
Oporornis tolmiei
Geothlypis trichas
Wilsonia pusilla
Icteria virens

Wrens

Cactus wren
Bewick's wren
House wren
Marsh wren

Old World Warblers and Gnatcatchers

Blue-gray gnatcatcher
Coastal California gnatcatcher

Kinglets

Ruby-crowned kinglet

Solitaires, Thrushes, and Allies

Swainson's thrush
Hermit thrush
American robin

Babblers

Wrentit

Mimic Thrushes

Northern mockingbird
California thrasher

Starlings

European starling

Pipits

American pipit

Silky-Flycatchers

Phainopepla

Wood Warblers

Orange-crowned warbler
Yellow warbler
Yellow-rumped warbler
Townsend's warbler
Hermit warbler
Northern waterthrush
MacGillivray's warbler
Common yellowthroat
Wilson's warbler
Yellow-breasted chat

Thraupidae

Piranga ludoviciana

Emberizidae

Pipilo chlorurus
Pipilo erythrophthalmus
Pipilo crissalis
Aimophila ruficeps
Spizella passerina
Chondestes grammacus
Passerculus sandwichensis
Ammodramus savannarum
Passerella iliaca
Melospiza melodia
Melospiza lincolnii
Zonotrichia atricapilla
Zonotrichia leucophrys

Cardinalidae

Phoebastria melanocephalus
Guiraca caerulea
Passerina amoena

Icteridae

Agelaius phoeniceus
Agelaius tricolor
Sturnella neglecta
Xanthocephalus xanthocephalus
Euphagus cyanocephalus
Molothrus ater
Icterus cucullatus
Icterus bullockii

Fringillidae

Carpodacus mexicanus
Carduelis pinus
Carduelis psaltria
Carduelis lawrencei
Carduelis tristis

Passeridae

* *Passer domesticus*

Tanagers

Western tanager

New World Sparrows

Green-tailed towhee
Spotted towhee
California towhee
Rufous-crowned sparrow
Chipping sparrow
Lark sparrow
Savannah sparrow
Grasshopper sparrow
Fox sparrow
Song sparrow
Lincoln's sparrow
Golden-crowned sparrow
White-crowned sparrow

Cardinalid Finches

Black-headed grosbeak
Blue grosbeak
Lazuli bunting

American Orioles

Red-winged blackbird
Tricolored blackbird
Western meadowlark
Yellow-headed blackbird
Brewer's blackbird
Brown-headed cowbird
Hooded oriole
Bullock's oriole

Finches

House finch
Pine siskin
Lesser goldfinch
Lawrence's goldfinch
American goldfinch

Old World Sparrows

House sparrow

MAMMALIA

Didelphidae

Didelphis virginiana

Leporidae

Sylvilagus auduboni

Sciuridae

Spermophilus beecheyi

Geomyidae

Thomomys botta

Cricetidae

Neotoma sp.

Microtus californicus

Canidae

Canis latrans

Procyonidae

Procyon lotor

Mustelidae

Spilogale gracilis

Mephitis mephitis

Felidae

Felis rufus

Cervidae

Odocoileus hemionus

MAMMALS

Opossums

Virginia opossum

Rabbits and Hares

Audubon cottontail

Squirrels

California ground squirrel

Pocket Gophers

Botta pocket gopher

Mice, Rats, and Voles

Woodrat

California vole

Foxes, Wolves, and Allies

Coyote

Raccoons

Raccoon

Weasels and Relatives

Spotted skunk

Stripped skunk

Cats

Bobcat

Deer, Elk, and Allies

Mule deer

Taxonomy and nomenclature follows Mattoni (1990), Laudenslayer et al. (1991), and the American Ornithologists' Union (1998).

