

POPULATION STATUS AND TRENDS OF THE CALIFORNIA LEAST TERN

JACK M. FANCHER, U.S. Fish and Wildlife Service, 2730 Loker Avenue West, Carlsbad, CA 92008

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Abstract: At the time of its Federal and State listing as endangered in 1970, there were estimated to be about 600 breeding pairs of the California least tern, *Sterna antillarum browni*, nesting in California. In the first decade of recovery efforts, emphasis was on protection and/or establishment of designated nesting areas. Statewide annual monitoring of the breeding sites and estimates of the breeding population began in 1973, with estimates of fledgling production beginning in 1978. By 1980, the tern's breeding population had doubled to 1160 pairs with 16 nesting sites supporting 20 or more pairs and a total of 31 sites used in that year. In 1982, the severe oceanographic phenomenon, involving the northerly extension of tropically warmed surface waters and declines in some southern California fishery resources, known as El Niño, contributed to a decline in the least tern breeding population to a low of 944 pairs in 1987. The population recovery emphasis since 1980 has been nesting site management and reduction of predation impacts in order to increase reproductive success. By 1990, the Statewide breeding population was estimated to be 1708 pairs with 20 nesting sites supporting 20 or more breeding pairs and a total of 28 sites used in that year.

The California least tern, is a once abundant, migratory seabird that returns to coastal California and Baja Mexico to breed from southern overwintering regions. Historic nesting locales were primarily sandy, ocean beach strand areas near estuaries and river mouths. Such beaches and coastal nesting opportunities for the least tern have become intensively disturbed or eliminated by human activities, such as seaside recreation, roads, marinas, ports, and houses. During the breeding period, April to September, the least tern feeds itself and its young entirely on fish captured from nearshore waters, estuaries, lagoons, bays, and river mouths (Atwood and Minsky 1983, Atwood and Kelly 1984). Filling, channelizing, or water quality degradations probably contributed to the decline of the least tern population by eliminating or degrading foraging areas. The California least tern was classified as an endangered species in 1970 by the State of California and the U. S. Department of the Interior due to its diminished population level caused primarily by disruption or unavailability of breeding sites and adjacent foraging waters.

Efforts were begun to identify and protect breeding sites and adjacent water areas. Annual population censuses were begun by the California Department of Fish and Game (CDFG) in 1973 and fledgling production estimates were begun in 1978. The California Least Tern Recovery Plan was completed in 1980 (Fish and Wildlife Service 1980). Critical habitat designations and revision to the Recovery Plan were considered but never proposed.

Least tern nesting areas are typically flat, open areas near the coast with light-colored, sandy substrate, and little vegetation (Minsky 1987). In coastal California, very few "natural" nesting areas remain. Many have been created or are highly modified man-made areas (Erickson 1985), such as next to aircraft taxiways and highways, within industrial port areas, flood-prone areas, and several are on southern Californian beaches when

the Fourth of July holiday crowd arrives. Many least tern nesting colonies remain concentrated in relatively small areas that, consequently, are very vulnerable to predation or disturbance.

When an active least tern nesting colony is disturbed in some manner, nesting pairs may respond by nesting again within the same colony, renesting at a nearby colony, or abandoning attempts to breed in that season (Massey and Fancher 1989). Renesting attempts after the first month of the breeding season occur during the later influx of two-year-old birds breeding for the first time (Massey and Atwood 1981). The least tern also shows strong year-to-year fidelity to successfully used breeding sites, or proximal clusters of sites, and may return to a previously disturbed site after several years of absence (Atwood and Massey 1988).

RESULTS

Census Methods and Annual Reports

Breeding pairs and fledgling production were estimated by direct counts made during several colony visits per year. However, these methods have varied between census takers, sites, and years. However, since the late 1970's, relatively standardized techniques and comprehensive coverage have produced more reliable estimates of breeding pairs (Massey and Atwood 1981). Estimates of fledgling production are likely to have been less accurate than the breeding pair estimates due to complications of timing and frequency of visits by the census taker (Massey 1989). Site reports have been compiled and most have been reported in annual summary reports for CDFG Nongame Bird and Mammal Section. The breeding pair and fledgling production estimates for each year and site are usually reported as a range, although they have been averaged herein (Table 1).

Between 1978 and 1990, over 50 different localities have attracted at least one tern pair in at least one year.

Table 1. California least tern breeding colonies: Numbers of breeding pairs and in parentheses (number of fledglings produced). When ranges were estimated, numbers here represent averages.

Colony	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
San Francisco Bay Area													
PGE, Pittsburgh	-	-	-	-	-	-	8 (8)	4 (4)	1 (2)	4 (5)	3 (1)	4 (2)	3 (0)
Port Chicago	2 (1)	3 (2)	12 (5)	-	-	6 (1)	-	-	-	3 (2)	1 (0)	-	-
NAS Alameda	80 (13)	40 (0)	60 (5)	74(103)	73 (0)	3 (1)	44 (9)	53 (48)	43 (75)	58 (87)	63 (84)	74 (84)	99(105)
Oakland Airport	-	-	-	-	12 (11)	61 (8)	15 (2)	12 (9)	32 (11)	9 (4)	7 (0)	7 (2)	8 (0)
Bair Island	-	4 (0)	38 (14)	23 (28)	53 (58)	22 (0)	3 (2)	-	-	-	-	-	-
San Luis Obispo County													
Oso Flaco Lake	-	7 (0)	7 (3)	-	2 (0)	1 (0)	-	-	-	-	-	-	4 (0)
Santa Barbara County													
Guadalupe Dunes	19 (15)	21(10)	17 (15)	25 (8)	12 (3)	7 (3)	10 (2)	11 (10)	13 (0)	23 (36)	11 (0)	18 (13)	32 (7)
San Antonio Creek	9 (6)	4 (4)	2 (0)	4 (4)	6 (2)	18 (12)	17 (0)	14 (5)	3 (0)	2 (0)	7 (3)	3 (0)	1 (0)
Purisma Point	5 (7)	27(25)	28 (20)	30 (12)	18 (1)	14 (9)	20 (2)	18 (3)	-	14 (0)	3 (1)	17 (2)	9 (3)
Santa Ynez River	-	-	-	-	-	8 (4)	-	-	-	4 (6)	-	3 (0)	-
Ventura County													
Santa Clara River	13 (12)	18(25)	13 (14)	23 (25)	19 (16)	3 (2)	8 (6)	12 (7)	14 (15)	8 (10)	3 (4)	6 (8)	27 (34)
Ormond Beach ^a	-	7 (3)	-	-	7 (0)	4 (2)	-	5 (0)	-	0 (0)	3 (0)	3 (1)	42 (60)
Point Mugu	11 (0)	-	12 (1)	-	13 (0)	22 (15)	18 (5)	60 (70)	51 (40)	20 (3)	100 (25)	86(118)	12 (0)
Los Angeles County													
Venice Beach	68 (75)	88(140)	158(240)	150(195)	170 (60)	145(140)	83 (94)	96(113)	104(113)	109 (82)	165(192)	137(134)	206(279)
Playa del Rey	28 (30)	22(25)	2 (0)	16 (0)	-	-	-	-	-	-	-	-	-
Terminal Island	-	-	-	38 (7)	65 (15)	78 (90)	117 (70)	60 (63)	79 (83)	40 (5)	5 (0)	19 (6)	32 (12)
Costa del Sol	-	-	-	18 (12)	21 (2)	23 (14)	5 (7)	33 (0)	4 (0)	-	-	-	-
San Gabriel River	63 (70)	53(60)	2 (0)	16 (0)	-	-	-	-	-	-	-	-	-
Orange County													
Anaheim Bay	-	6 (0)	41 (24)	43 (20)	19 (2)	4 (2)	22 (33)	20 (3)	41 (81)	69(103)	83 (66)	97(104)	102(147)
Bolsa Chica	-	39 (6)	23 (15)	63 (20)	90 (75)	141 (45)	103 (50)	111 (65)	68 (81)	80 (63)	92 (65)	115 (45)	217(190)
Huntington Beach St Pk	83(100)	88(90)	80 (85)	113(168)	98 (50)	88 (60)	70 (20)	45 (42)	69 (34)	58 (9)	86 (43)	70 (5)	46 (18)
Upper Newport Bay	9 (0)	7 (0)	4 (0)	-	-	9 (2)	6 (0)	-	22 (26)	43 (33)	73 (55)	74 (55)	70 (85)

^a Multiple nesting areas were combined.

Table 1. California least tern breeding colonies (cont.)

Colony	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
San Diego County													
White Beach	-	15 (8)	70 (22)	23 (10)	1 (0)	12 (9)	12 (4)	7 (11)	4 (0)	-	-	12 (14)	20 (21)
Sta Margarita River ^a	35 (8)	36(22)	56 (4)	80 (50)	131 (50)	237 (91)	234(113)	197(108)	163(220)	192 (60)	246(387)	151 (67)	293(306)
Buena Vista Lagoon	-	-	1 (2)	3 (1)	-	-	-	-	4 (0)	-	-	16 (6)	-
Agua Hedionda	13 (4)	26 (9)	12 (4)	4 (0)	-	-	-	-	-	-	-	-	-
Batiquitos Lagoon	25 (0)	39(33)	27 (17)	39 (26)	25 (6)	1 (2)	3 (6)	18 (24)	17 (0)	8 (18)	48 (28)	3 (0)	27 (26)
San Elijo Lagoon	9 (0)	12 (7)	17 (8)	12 (8)	28 (12)	28 (23)	20(10)	13 (0)	9 (2)	13 (2)	11 (3)	17 (0)	11 (3)
Los Penasquitos	22 (10)	16 (0)	15 (0)	-	-	-	-	-	-	-	-	-	-
N. Fiesta Island	9 (8)	15 (4)	8 (4)	8 (1)	55 (75)	68 (0)	-	-	4 (2)	-	-	-	-
FAA Island	145 (5)	96(48)	150(190)	75 (80)	-	12 (18)	60 (0)	-	55 (22)	25 (3)	37 (50)	125 (30)	177(135)
Mariner's Point	-	-	-	-	-	-	-	-	-	-	-	2 (0)	25 (37)
Other Mission Bay ^a	-	-	-	-	42 (5)	-	-	-	-	-	-	-	-
Lindbergh Field	43 (10)	108(53)	71 (31)	-	8 (3)	27 (14)	12 (2)	-	11 (10)	50 (60)	80 (30)	9 (0)	-
Naval Training Center	10 (5)	-	-	-	-	-	-	-	6 (6)	11 (0)	1 (1)	-	-
North Island NAS	36 (0)	78(70)	100 (9)	60 (5)	66 (28)	75 (90)	45 (40)	83 (25)	35 (0)	6 (4)	20 (4)	24 (14)	38 (23)
Delta Beach	4 (4)	11 (3)	-	-	-	-	-	13 (17)	43 (25)	28 (10)	7 (10)	33 (20)	45 (54)
Chula Vista Wildlife Res	-	-	57 (31)	97 (35)	73 (14)	75 (9)	19 (4)	-	-	-	24 (35)	28 (7)	70 (32)
D Street Fill	47 (15)	26(18)	14 (0)	-	1 (2)	1 (0)	16 (15)	44 (0)	6 (7)	28 (10)	19 (0)	2 (0)	-
Coronado Cays	9 (10)	39 (7)	-	-	-	-	-	-	-	-	-	-	-
Saltworks	29 (2)	29 (9)	21 (4)	1 (0)	-	-	15 (4)	30 (6)	12 (2)	21 (4)	17 (15)	28 (3)	25 (10)
Tijuana River Mouth ^a	10 (8)	28(19)	38 (25)	12 (15)	26 (17)	63 (50)	66 (16)	37 (24)	39 (33)	21 (16)	44 (30)	49 (20)	72 (28)
Total breeding pairs	832	1000	1160	1067	1130	1264	1046	1003	962	944	1253	1240	1708
Total fledglings produced	(418)	(696)	(769)	(833)	(511)	(894)	(518)	(654)	(904)	(633)	(1130)	(764)	(1612)

^a Multiple nesting areas were combined.

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