

POPULATION SIZE AND REPRODUCTIVE SUCCESS  
OF CALIFORNIA GULLS AT MONO LAKE, CALIFORNIA, IN 1997,  
WITH EMPHASIS ON THE NEGIT ISLETS

Richard Kaufmann and W. David Shuford

Report of  
Point Reyes Bird Observatory  
4990 Shoreline Highway  
Stinson Beach, CA 94970

September 1997

Contribution No. 726 of Point Reyes Bird Observatory

## ACKNOWLEDGMENTS

Dave Calleri, Al DeMartini, and Tricia Wilson made especially valuable contributions to field work, volunteer training, logistics, and data quality control. The following individuals aided in field work on the islands: Nadine Barter-Bowlus, Nathan Bomer, Davin Bowker, Arya Degenhardt, Michelle Hofmann, Chris Holabird, Heidi Hopkins, Dirk Kinsey, Paul Kinsey, Yee Kee Lam, Doug Moberg, Bob Morrill, Eric Morrill, Richard Morris, Jim Nelson, Kay Ogden, Moose Peterson, Michelle Petter, Tammy Filliater, Greg Reis, Mary Ruddell, Steven Schmidt, Amy Souder, Emilie Strauss, Lisa Strong-Aufhauser, and Rodney Temples. The Mono Lake Committee, and particularly Bartshe Miller and Shannon Nelson, provided valuable onshore support and volunteer coordination. Thanks to Tim Hansen of the High Sierra Shrimp Plant for providing boat storage and launching facilities and to Ilene Mandelbaum and Cedar Barager for temporary storage facilities. John Frederickson and his co-workers at the June Lake Marina were extremely helpful in lending us a boat and servicing our outboard motor. The Mono Basin National Forest Scenic Area via Roger Porter gave us permission to work on the nesting islands, and Larry Ford and Lori Gearman provided logistic and radio support. Dr. Joseph R. Jehl, Jr. kindly provided gull census data for the Paoha Islets, and Peter Kavounas of the Los Angeles Department of Water and Power provided lake level data. This study was funded in 1997 by the Mono Lake Committee.

## **ABSTRACT**

In 1997, nest counts estimated 49,914 adult California Gulls were nesting in late May. The Negit Islets supported 77% of Mono Lake's breeding gulls, versus 23% on the Paoha Islets. Twain Islet remained the most populous nesting island by holding 53% of Mono Lake's breeding gulls. The fledging rate on the Negit Islets of 0.37 chicks per nest was the second lowest since our studies began in 1983. An estimated 8204 young fledged from all the lake's nesting islands in 1997. Although lake level continued to rise, and no evidence of coyotes was found on any of the Negit Islets or Negit Island, gull nesting generally did not increase on islands formerly landbridged that are now isolated again. Future research will be necessary to document the length of time needed for the gulls to fully recolonize abandoned islands and to determine the causes of variable nesting success.

## INTRODUCTION

In 1997 Point Reyes Bird Observatory (PRBO) completed the fifteenth year of a study of the California Gull (*Larus californicus*) at Mono Lake, California. The objectives of our ongoing study are to measure year-to-year variation in population size and reproductive success and to determine their relationship to changing lake levels. This report focuses on the Negit Islets, which currently support most of the lake's nesting gulls, and on Negit Island, which supported the majority until the gulls abandoned it in 1979. Negit Island was recolonized in 1985 and was abandoned again in 1991.

The effects of recent changes in the Mono Lake ecosystem are of special interest to biologists (Patten et al. 1987, Botkin et al. 1988) and to public agencies vested with protecting the lake's valuable natural and scenic resources (Jones and Stokes 1993). Despite a recent decision that protects the Mono Lake ecosystem by allowing the lake level eventually to rise to 6392 feet (SCWRCB 1994), there is a continuing need to monitor the lake's resources, including nesting gulls, to document their response to the changing conditions.

Since 1941, the lake has dropped almost 45 vertical feet and nearly doubled in salinity because of water diversions of its inflowing streams. Wet winters in the early and mid-1980s caused a temporary reversal of the downward trend. The winters of 1986-87 through 1993-94 averaged very dry, and lake level fell to

6374.5 feet by May 1992. Very wet winters returned in 1994-95 and 1996-97, and lake level rose to 6381.1 feet in May 1997 and 6382.0 feet in August 1997 (P. Kavounas in litt.). Consequently, the channel that reformed between Negit Island and the landbridge in 1995 continued to widen in 1997.

### **STUDY AREA AND METHODS**

The study area at Mono Lake has previously been described in Shuford (1985) and Shuford et al. (1984, 1985).

#### **Nest Counts**

Richard Kaufmann and co-workers counted nests on the Negit Islets from 22 to 26 May. Field workers walked through all the colonies tallying each nest and marking them with a dab of paint to avoid duplicate counts. For some small, steep-sided islets brooding adults were counted from a small motorboat to estimate the number of nests present. Nest totals for the Negit Islets were added to those for the Paoha Islets provided by Joseph R. Jehl, Jr., and the number of adult gulls breeding at Mono Lake was estimated as twice the total number of nests at the lake.

Separate subtotals were compiled for nests within eight 10 X 20 m fenced plots on four islands (Twain, Little Tahiti, Little Norway, and Spot islets) which were monitored to determine chick production.

### **Chick Counts**

From 2 to 5 July, Kaufmann and co-workers banded chicks within the eight fenced plots on the Negit Islets. The numbers of chicks produced in these plots were used to estimate total chick numbers on all the Negit Islets combined and on all of Mono Lake's nesting islands (see below).

### **Count of Dead Chicks**

To assess survivorship from banding to fledging, from 5 to 7 August field workers made a thorough search for dead banded chicks on islets on which chicks had been banded.

### **Reproductive Success**

In 1997 we used the fenced plot method to estimate reproductive success:

**Combined Fenced Plot Method.** In this method the number of fledged chicks on the Negit Islets (**F**) is calculated as:

$(N/8) \sum_{i=1}^8 f_i$  where **N** is the total number of nests on the Negit Islets

and **f<sub>i</sub>** is the number of young fledged per nest in the eight Negit Islet fenced plots. As in prior years, all newly hatched (unbanded) chicks in July were assumed not to have fledged.

Estimates of the number of young fledged on the Paoha Islets, based also on fenced plots (J. R. Jehl, Jr. in litt.), were added to the Negit Islet totals to provide an estimate of the total number of young produced at Mono Lake in 1997.

## **RESULTS AND DISCUSSION**

### **Phenology**

In 1997 we found the first hatched chicks on 23 May, indicating that egg laying and chick hatching began about the same time as in most other years of our study.

### **Coyote Observations**

Unlike in 1996, in 1997 searches of Negit Island and all the Negit Islets failed to find any recent coyote sign.

### **Number of Breeding Adults in 1997**

In 1997, an estimated 38,498 gulls nested on the Negit Islets, about 11,414 on the Paoha Islets, and 2 on Paoha Island, for a lakewide total of 49,914 nesting adults (Table 1). In 11 of the last 15 years the lake's nesting population has ranged from about 44,000 to 50,000 gulls versus 61,000 to 65,000 in the 4 other years (Table 1).

In 1997, the Negit Islets supported 77% of Mono Lake's breeding gulls versus 23% for the Paoha Islets. Twain Islet alone held 53% of the lakewide breeding population. Nesting gull numbers decreased from 1996 to 1997 on some of the very small Negit Islets where nesting substrate was inundated by the rising lake level. Notably, numbers increased 32% on the Paoha Islets (Table 1) despite considerable loss of nesting habitat to the rising lake.

Table 1. Nest counts on the Negit Islets from 1983 to 1997. Data

for the Paoha Islets from Jehl (in litt. and previous reports).

NEGIT ISLETS	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Twain	3808	7372	9309	11985	12422	11057	10573	15045	10883	15896	15431	15792	11035	12690	13140
L. Tahiti	5260	7051	6572	5763	4261	3692	2983	4218	3205	3810	3616	4505	4021	4570	4092
L. Norway	2218	1956	1407	810	360	254	269	432	355	473	428	533	493	766	794
Steamboat	997	1016	721	722	467	359	314	704	671	862	958	1217	981	459	505
Java	143	396	195	400	439	458	543	789	586	1040	399	199	4	70	41
Spot	505	358	296	311	248	247	231	309	311	335	356	449	422	399	341
Tie	511	231	196	150	84	87	95	167	160	220	210	320	264	267	194
Krakatoa	319	272	178	173	185	197	174	283	181	209	146	175	116	57	33
Hat	146	109	73	56	14	18	10	19	10	21	21	14	19	41	58
La Paz	105	58	43	30	22	21	23	46	49	70	77	57	55	44	30
Geographic	140	0	0	0	0	0	2	4	10	68	84	69	51	0	0
Muir	170	0	0	0	0	1	10	61	84	139	131	116	87	4	0
Saddle	175	46	41	29	14	13	10	18	8	14	10	11	21	31	13
Midget	5	3	3	4	4	2	3	3	2	2	3	2	2	2	3
Siren	51	0	1	0	0	0	1	7	7	19	20	14	16	10	0
Comma	2	1	1	1	0	0	0	0	1	1	1	0	0	1	0
Castle Rocks	2	3	4	3	4	6	5	4	5	5	3	3	3	4	4
Pancake	0	0	0	7	570	1216	1395	651	0	0	0	0	0	0	1
Java Rocks	0	0	0	0	4	3	0	4	2	13	15	9	5	1	0
No name	0	0	0	0	0	0	0	1	0	3	3	3	1	0	0
<hr/>															
Negit Islet															
Totals:	14557	18872	19040	20444	19098	17631	16641	22765	16530	23200	21912	23488	17596	19416	19249
<hr/>															
Paoha Islet															
Totals:	8001	3546	3151	3596	3208	2833	2682	5145	4442	9283	8498	8182	7331	4334	5707
<hr/>															
Negit Island:	--	--	92	636	1502	2037	2765	2827	788	4	12	0	0	0	0
<hr/>															
Paoha Island:	--	--	2	102	0	0	0	0	0	1	0	0	0	0	1
<hr/>															
Mono Lake															
Totals:	22558	22418	22285	24778	23808	22501	22088	30737	21760	32488	30422	31670	24927	23750	24957
<hr/>															
Nesting															
Adults:	45116	44836	44570	49556	47616	45002	44176	61474	43520	64976	60844	63340	49854	47500	49914

### Fledging Rate in the Fenced Plots

The eight fenced plots held an average of 81.00 (SE = 8.16) nests and fledged an average of 0.37 (SE = 0.03) chicks per nest



(Table 2). The fledging rate in 1997 was the second lowest recorded since our studies began and, hence, was well below the average of 0.98 (SE = 0.09) chicks per nest for the Negit Islets for the last 14 years, 1983 to 1996.

Table 2. Reproductive success of gulls in eight fenced plots in 1997.

PLOTS	NESTS PER PER PLOT	CHICKS PER NEST 2-5 JULY	CHICKS FLEDGED PER NEST
Little Norway	50	0.56	.34
Spot	89	0.53	.30
Little Tahiti West	85	0.65	.47
Little Tahiti East	49	0.71	.35
Twain North	88	0.66	.40
Twain South	81	0.75	.44
Twain Northeast	121	0.45	.24
Twain West	85	0.58	.45
	—	—	—
$\bar{x} =$	81.00	0.61	.37
SD =	23.08	0.10	.08
SE =	8.16	0.04	.03

**Reproductive Success**

Based on the average number of young fledged per nest in eight fenced plots on the Negit Islets (Table 2) and the total number of nests there (Table 1), an estimated 7122 young fledged from the Negit Islets in 1997. Combining this total with the approximately 1082 young estimated to have fledged from the Paoha Islets (J. R. Jehl, Jr. in litt.) gives an estimate of about 8204 young fledged from Mono Lake in 1997.

**Conclusions**

Although lake level continued to rise in 1997, and no evidence of coyotes was found on any of the Negit Islets or Negit Island, gull nesting generally did not increase on islands formerly landbridged that are now isolated again. Pancake islet was recolonized for the first time since 1990, but only one pair of gulls nested there. It would be valuable to continue monitoring the gulls to document the period of time needed for them to fully recolonize abandoned islands.

As in 1996, there was no clear explanation for the low reproductive success in 1997.

**LITERATURE CITED**

- Botkin, D., W. S. Broecker, L. G. Everett, J. S. Shapiro, and J. A. Wiens. 1988. The future of Mono Lake. University of California Water Resources Center Report 68.
- Jones and Stokes Associates. 1993. Environmental impact report for the review of Mono Basin water rights of the City of Los Angeles. Draft. May. (JSA 90-171). Sacramento, Calif. Prepared for California State Water Resources Control Board, Div. of Water Rights, Sacramento.
- Patten, D. T. et al. 1987. The Mono Basin ecosystem: Effects of changing lake level. National Academy Press, Washington, DC.
- Shuford, W. D. 1985. Reproductive success and ecology of California Gulls at Mono Lake, California in 1985, with special reference to the Negit Islets: An overview of three years of research. Point Reyes Bird Observatory Report, Contribution No. 318.
- Shuford, W. D., E. Strauss, and R. Hogan. 1984. Population size and breeding success of California Gulls at Mono Lake, California in 1983. Final report for contract #14-16-0009-83-922 to the U.S. Fish and Wildlife Service.
- Shuford, W. D., P. Super, and S. Johnston. 1985. Population size and breeding success of California Gulls at Mono Lake, California in 1984. Point Reyes Bird Observatory Report, Contribution No. 294.
- State of California Water Resources Control Board. 1994. Mono Lake Basin water right decision 1631. State Water Resources Control Board, Division of Water Rights, 901 P St., 3rd Floor, Sacramento, CA 95814.