

FEATURE ARTICLES

ANNUAL VARIATION IN NUMBERS OF BREEDING CALIFORNIA GULLS AT MONO LAKE, CALIFORNIA: THE IMPORTANCE OF NATAL PHILOPATRY AND LOCAL AND REGIONAL CONDITIONS

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Abstract. The California Gull (*Larus californicus*) breeding colony at Mono Lake, California, is the second largest in the world, but its size can fluctuate annually by >45%. We examined six groups of factors that potentially could affect the numbers of pairs nesting each year, including availability of nesting habitat, numbers of potential breeding gulls, environmental conditions along the Pacific coast in the preceding winter, spring conditions at the lake, food availability at the lake, and prior breeding experience. Four variables explained >80% of the variation in the numbers of breeding gulls at Mono Lake between 1987 and 2003: the potential number of four-year-old gulls returning to the lake to breed for the first time, winter coastal conditions associated with the Pacific Decadal Oscillation, density of endemic brine shrimp (*Artemia monica*) close to the time of egg-laying, and mean temperature in the month before egg-laying. Of the four factors the latter two, which reflect local conditions near the time of egg-laying, had the most profound direct effect on the numbers of breeding gulls. Yearly variation in the snow pack and spring runoff affects brine shrimp numbers through changes in limnological conditions, thus regional climate patterns may indirectly influence gull numbers.

Key words: breeding numbers, California Gull, constraints, *Larus californicus*, Pacific Decadal Oscillation, philopatry, prey.