NOTES

THE CASPIAN TERN AT MONO LAKE

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Largest of the tern species, the Caspian Tern (*Sterna caspia*) breeds at both coastal and inland localities. The species was very localized in western North America until the 1940s, when a major expansion occurred. A second wave of colonization took place from the mid-1960s through the 1970s, and by the early 1980s 20 colonies totaling ca. 6000 pairs were known from California, Oregon, Washington, Idaho, Nevada, and Baja California (Gill and Mewaldt 1983). At least two other large colonies have subsequently formed (Tulare Lake, California, and Stillwater National Wildlife Refuge, Nevada). Wherever it breeds, this tern typically associates with other colonial larids.

The history of the colony at Mono Lake, California, where terns breed amid California Gulls (*Larus californicus*) is not well documented. The species was not reported by Dawson (1923) or Grinnell and Miller (1944), and D.W. Johnston (pers. comm.) did not recall seeing either terns or suitable nesting habitat in 1952 or 1953. Neither was it mentioned by Gallup (1963), who was banding gulls and terns in the West and visited Mono Lake in 1963. Jurek (1972) noted that terns had nested in the past but gave no details.

This species prefers flat sandy nesting areas with unobstructed visibility. Although such habitat is abundant on Paoha Island, which formed ca. 200 years ago (S. Stine pers. comm.), I know of no evidence that terns ever nested there. (For a map of Mono Lake and its islets, see Jehl et al. 1984.) Apparently the colony formed in the mid 1950s — or more likely the mid 1960s — when the declining lake began to expose nesting habitat on some of the sandier Negit Islets. In any event, by 1976 terns were nesting with gulls on Twain (and Pancake?) of the Negit Islets (Winkler 1977), and they continued to nest on Twain Islet until at least 1981 (Winkler pers. comm.; Gill and Mewaldt 1983). In 1982 and 1983, I found them on Gull Islet of the Paoha Islets, which group began to emerge in the 1960s. When the rising lake inundated Gull Islet in 1983, they moved to adjacent Browne Islet and nested there from 1984 to 1986.

Terns arrive in the Mono Basin in early April (earliest 29 March, D. Gaines pers. comm.) and take up residence on the islets by the middle of the month. Because they feed on fish, which they obtain from nearby fresh-water lakes, their dependence on Mono Lake is limited to the availability of secure nesting areas. Laying evidently begins in mid-May, for tiny chicks may be present by mid-June (12 June 1984). Some early nests are destroyed by gulls; in 1983 and 1985 chicks were not seen until 26-27 June, and in 1983 a day-old chick was present on 20 July. Fledging typically occurs in mid to late July, after which time terns depart, although in 1976 several young and fledglings were seen on Twain Islet as late at 30 August (Winkler 1977). I interpret the occasional birds that sometimes appear in early September as transients from colonies farther inland. The latest record is 15 September (D. Gaines pers. comm.).

Table 1. Population size and nesting success of Caspian Terns at Mono Lake, California, 1976-1986.

Year	Location	Max. No. Adults	No. Pairs Nesting	No. Chicks Fledged	References
1976	Negit Islets: Twain/Pancake	38	6-12?	10?	Winkler 1977, and pers. comm.
1979	Negit Islets: Twain	No data	10-15	?	Gill and Mewaldt 1983, Winkler pers. comm.
1980 -81	Negit Islets: Twain	No data	—	—	Winkler pers. comm.
1982	Paoha Islets: Gull	22	ca. 14	3-4	This study
1983	Paoha Islets: Gull A	24	ca. 14	2	This study
1984	Paoha Islets: Browne	10	5	0	This study
1985	Paoha Islets: Browne	6	2	0	This study
1986	Paoha Islets: Browne	4	1?	0	This study

Terns are sensitive to disturbance (Fetterolf and Blokpoel 1983), and when challenging intruders leave their eggs and chicks vulnerable to gulls. Accordingly, I made no attempt to study their biology in detail but monitored the nesting area from a small boat. Since the late 1970s colony size had decreased from 10-15 pairs to one in 1986, and production has dropped from ca. 10 chicks in 1976 to none in 1984-1986 (Table 1). Predation by gulls has been largely responsible for the poor success since 1982, and was noted in 1979 as well (D. Winkler pers. comm); occasional unauthorized visits by humans may also be a contributing factor. In 1983, one chick died after being entangled in a monofilament fishing line, and in 1984 one was killed by a Great Horned Owl (*Bubo virginianus*).

California Gulls prefer more irregular nesting terrain than terns (J.R. Jehl, Jr. and S.A. Mahoney, unpubl.) but, if their preferred sites are occupied, as is the case on most of the Paoha Islets, will shift into featureless areas and displace nesting terns (see also Kingery 1985). Since 1982, because of a rising lake level and severe erosion, nesting densities of gulls have generally increased on the Paoha Islets, and the ternery has been surrounded and encroached on by breeding gulls. As a result, any benefits terns might have realized by nesting with gulls have been countered by increased predation. Although much unoccupied tern habitat exists on Coyote Islet, only 200 m from Browne Islet, where they could nest farther from dense concentrations of gulls, they have not moved or even investigated potential sites there. Such a move might have decreased the risk of predation by gulls but, ironically, would have increased the risk of predation by Great Horned Owls and Golden Eagles (*Aquila chrysaetos*) (Jehl and Chase, in press), which concentrated their efforts on that islet from 1982 to 1986.

Gill and Mewaldt (1983) contended that colonies of Caspian Terns in the inland West are maintained largely by immigration and not by local production. The Mono

Lake colony seems to fit their interpretation. It seems unlikely to recover and become self-sustaining so long as the gull population continues to grow.

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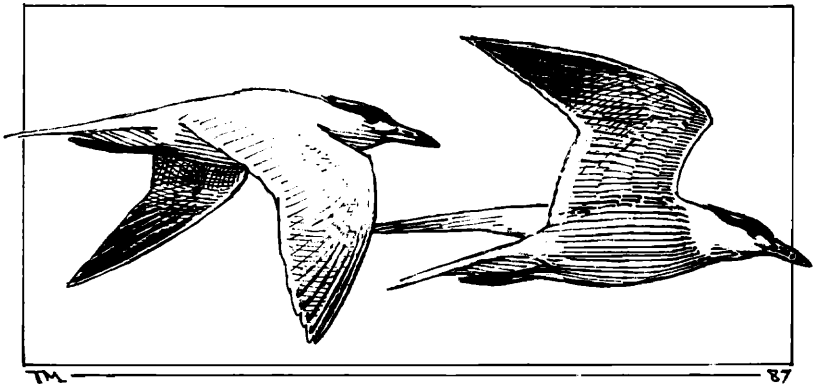

Caspian Terns *Sketch by Tim Manolis*