

# The Breeding Populations of Piscivorous Birds of Eagle Lake

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Eagle Lake is the second largest natural lake in California and its populations of piscivorous birds are very large. Populations of Western and Eared Grebes at Eagle Lake are probably the largest in California and may be the largest in the United States (Gould and Koplín 1971). Gould and Koplín studied the effects of human disturbance on the breeding success of piscivorous birds. My study, three and four years later, shows the changes in these birds' populations at a lake which has had a ten percent increase in human visitors in each of the past three years. (Maas 1974).

## STUDY AREA

Eagle Lake is located 42 km northwest of Susanville, California at an elevation of 1557 meters and has a surface area of 10,530 hectares. It is located in an ecotone between the Sierra Nevada coniferous forest and the Great Basin desert habitats. Because of its inaccessibility, it is a relatively undeveloped area although it is rapidly becoming a vacation area.

Ornithological information in the Eagle Lake area is very meager. Gould and Koplín (1971) and Gould (1971, 1974) have been the only investigators since Grinnell *et al.* (1930) to study bird populations at Eagle Lake except for Garber's (1972) and U.S. Forest Service investigations on the Osprey.

## METHODS

A census of the entire lake was taken by boat and on foot in March, April, and May of 1974 (Dawson, 1974). Three censuses were made during each of the months of June, July, and August in 1974 and 1975. An attempt was made to locate all nests within 25 meters of the shore, on islands, and in emergent vegetation. All nests located were tagged with a numbered heavy paper tag. Population sizes were determined on the basis of active nests.

## RESULTS

Table 1 lists the results of this study along with those of Gould and Koplín's (1971). Figure 1 shows the locations of the major breeding concentrations. As the table shows, almost all populations have decreased considerably, although a few have increased or established breeding populations. A number of White Pelicans (*Pelecanus erythrorhynchos*) are non-breeding summer residents at Eagle Lake even though some adult males had breeding projections on their bills and

examination of three freshly dead individuals showed well developed gonads. Population sizes of pelicans ranged from 66 to 98 over the past four years (pers. obs.).

Table 1

Species	Number of individuals		
	1970 <sup>1</sup>	1971 <sup>1</sup>	1974
Western Grebe	3000	3800	2400
Eared Grebe	300	530	0
Double-crested Cormorant	0	0	22
Common Merganser	0	3-6	5
Bald Eagle	0	0	2
Osprey	52 <sup>2</sup>	58 <sup>2</sup>	53
Great Blue Heron	74	0	18
California Gull	0	0	26
Forster's Tern	300	150	56
Black Tern	600	150	46

1. All data except for Osprey from Gould and Koplín (1971)

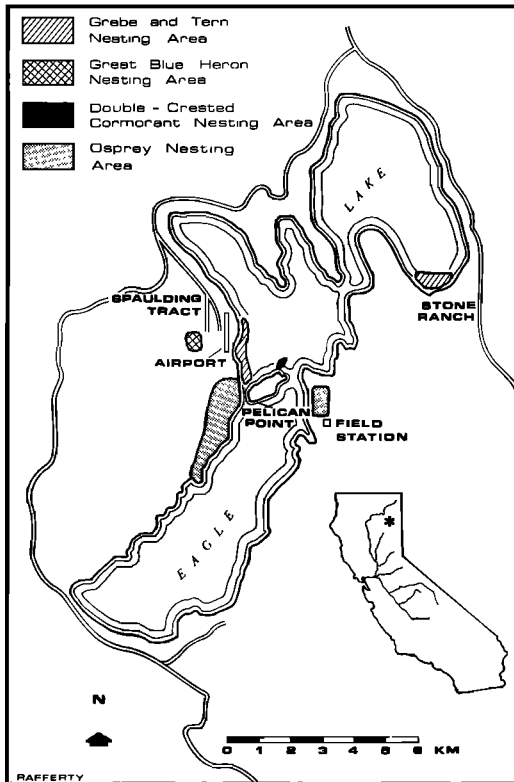
2. Garber. (1972)

## DISCUSSION

Eagle Lake is rapidly becoming a popular recreation area. The general decline since 1971 of piscivorous birds may be owing to this human population increase and its resultant increase in activity around the lake. The grebes and terns that nest in the rushes (*Juncus* sp.) and bullrushes (*Scirpus* sp.) have experienced a loss of habitat in the past few years owing to human intrusion (Gould and Koplín 1971). Increased boating activity has caused the destruction of nests, abandonment of nests by parents, or inundation of the eggs, preventing proper incubation. The populations may have also been affected by the rising water level of the lake.

The water level—higher than previous years—(Maslin, pers.comm.) caused a delay in the nesting times since the birds could not nest until the emergent vegetation grew tall enough to support the floating nests. This delay (of perhaps 3-4 weeks), caused the peak of nesting to occur later in the summer, coincident with the peak of human activity on the lake. The island on which the cormorants nested was almost inundated in 1975

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1974 may be owing to the fact that the islands they nested on (see Fig. 1) have just recently been isolated from the shore, perhaps about 1970 (Maslin, pers. comm.). Predation by terrestrial animals may have prevented their previous breeding in these areas.

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due to this high water level; fewer nests could be built.

The California Gull and Double-crested Cormorant were non-breeding summer residents in 1971 (Gould and Koplin 1971). Their success in

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