

Banks (1963a, 1963b, 1964) may have been due to different climatic factors and/or food availability in the years that they made their observations.

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WESTERN GULLS AS A POSSIBLE PREDATOR OF CALIFORNIA SEA LION PUPS¹

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The breeding period of Western Gulls (*Larus occidentalis*) extends from April to mid-August (Sowls et al. 1980), overlapping with that of California sea lions (*Zalophus californianus*) that breed from late May to the end of July (Peterson and Bartholomew 1967). Both species may occupy the same beaches, thus favoring the occurrence of a commensalist relationship in which gulls consume sea lion placentas (Hunt and Butler 1980). Sea lions on the other hand, may be alerted by gull squawks when the seabirds detect some possible danger (pers. observ.). Interactions among gulls and sea lions, however, may take another context as referred to below. During the beginning of the California sea lion breeding season of 1982, we visited the rookery located on Santa Margarita Island (24°18' to 24°32'N; 111°42'

to 112°01'W) and counted the first 20 pups born that year. Of these, three animals were dead and exhibited rounded holes on the belly and no eyes. At that time, about 200 Western Gulls were present on the beach, many of them walking around the sea lions. During our observations we made some noise that caused many mothers of the pups to go to the sea. Immediately after the mothers were gone, many gulls surrounded the pups and began to peck them. Based on these observations we supposed that the gulls could have caused the wounds on the dead pups.

To test this hypothesis, we planned an experiment for the first week of June 1983. For that purpose we selected a place for observing a small section of the sea lion colony from which the disturbances were minimized. The numbers of females, pups, and gulls were recorded, as well as the interspecific attacks. Pecking on a pup body was considered to be a gull attack and a sea lion attack was any attempt to bite or pursue the gulls. The observations were registered under two conditions, undisturbed and disturbed colony. In the first case, the gulls walked around the sea lions sometimes attempting to peck the pups and doing so on a few

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TABLE 1. Interactions among Western Gulls and California sea lions at Santa Margarita Island B.C.S., Mexico.

Time of observation	No. of sea lions		No. of gulls	Interspecific attacks	
	Females	Pups		Gulls on pups	Females on gulls
Undisturbed colony					
10:20	65	35	54	1	0
10:35	65	35	45	0	0
10:50	65	35	36	2	0
11:05	65	35	14	0	0
11:20	63	35	36	2	0
Total 60 min	\bar{x} 64	35	37	Total 5	0
Disturbed colony					
11:27	30	35	16	12	3
11:32	24	35	23	15	2
11:36	24	35	22	14	1
11:44	10	35	49	13	2*
Total 17 min	\bar{x} 22	35	27	Total 54	8

* A sea lion female was able to bite a gull wing.

occasions. To initiate the condition of disturbance, one of us walked on the beach several times at intervals to make the mothers move into the sea. During this period the gulls were more active, flying around and pecking the pups more frequently, as is shown in Table 1. Interspecific interactions increased during perturbations in spite of both the shorter time of observation and the fewer number of gulls. The number of gulls was reduced as a result of the first disturbance, but after several disturbances the gulls intensified their attacks in such a way that we decided to stop the experiment by causing a final disturbance to check out the possible physical damage to the pups. We found a pup with a fresh umbilical cord exhibiting one abdominal wound at the base of the cord. The wound, a perforation, was more likely caused by a gull beak than by a sea lion bite or during the stampede of the sea lions going to the sea during the disturbances. We had already observed that the gulls were concentrated in larger numbers at the site where we found this pup.

Some observations on this island and on others inside the Gulf of California suggest that gulls are attracted not only by the presence of placental remains, but also by the fresh umbilical cords whose pink color and fresh appearance contrasts strongly with the dark skin of the pups. We suppose that the gull attacks on pups are more likely to occur when the mothers are absent and when the pups are a few hours old, i.e., when the pups have the umbilical cord that may attract gulls and poor muscular coordination that would make the pups unable to escape from the attacks. In these circumstances a continuous and massive attack could cause severe wounds on the pups that may lead to death.

The food of Western Gulls consists mainly of fishes, molluscs, and crustaceans, though gulls may attack Brown Pelican (*Pelecanus occidentalis*) chicks and exhibit cannibalism and intraspecific piracy of eggs (Ainley et al. 1974). By considering the experimental observations presented here we suppose that gulls may act as occasional predators of the California sea lion pups in this area.

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