

Interspecific Behavior Among Pinnipeds

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The distribution of pinnipeds, unlike that of most other mammals, is largely a linear one. The majority of species occur along insular or continental coast lines. In this respect they resemble certain members of the family Alcidae among birds (STORER, 1952, p. 189), as well as many littoral zone fishes, invertebrates and marine algae. There are a few exceptions such as the northern fur seal (*Callorhinus ursinus*), which is pelagic outside of the breeding season, and a few pinnipeds that have adapted themselves to inland waters.

The shoreline habitats that are utilized by most seals and sea lions can be divided into a relatively few categories. These might be classified as offshore rocks, cliffs and sea caves, rocky reefs, rocky beaches and sandy beaches. One can separate rocky reefs into inner and outer reefs and both kinds of beaches into a lower, a middle and an upper zone. These are the major habitats, outside of the polar regions, that are available to these marine mammals. They may be utilized as breeding rookeries, as hauling out areas outside of the reproductive season, or by non-breeding individuals at any time of year.

Along major continental coast lines most pinnipeds exhibit an aversion to readily accessible beaches and reefs. This has probably resulted from unfavorable contact over a long period of time with large terrestrial predators, including man in more recent times. As a result only the most isolated available habitats are used. Offshore islands, therefore, provide the principal breeding and resting places for most members of this order outside of the arctic and antarctic.

This habitat limitation for animals that often occur in large aggregations and may also have a rather well developed social organization sometimes results in a close contact between species. It is not uncommon, therefore, in favorable areas to find several species together (SCHEFFER, 1958, pp. 38–39).

Since May, 1961, the writer has been engaged in studying pinnipeds in such a situation on a small island known as Año Nuevo along the west coast of North America, about 50 miles south of San Francisco, California (ORR & POULTER, 1962). Here four species of pinnipeds regularly occur and mingle together in varying degrees although each shows a preference for a habitat that is not primarily the choice of the other three species. The pinnipeds involved are the Steller sea lion (*Eumetopias jubata*), the California sea lion (*Zalophus californianus*), the northern elephant seal (*Mirounga angustirostris*) and the harbor seal (*Phoca vitulina*). As of January, 1964, 42 days had been spent by the writer on the island with observations made during every month of the year.

Año Nuevo Island is situated about a half mile offshore and is approximately 11.6 acres in extent. However, off its seaward side, there are a number of reefs and exposed rocks, the largest of which has an area of 1.6 acres and is about 200 yards from the island. There are two major sandy beaches, one on the seaward and one on the leeward side. The remainder of the shoreline consists of rocky reefs. Back of the beaches and reefs the top of the island rises to a maximum height of about 50 feet and is partly overgrown with vegetation. A lighthouse tower and several buildings, all of which have been abandoned for a number of years, are situated on the higher southern half.

Steller sea lions show preference for the outer parts of reefs and large outlying

rocks on the seaward side. Año Nuevo Island has long been known to have the largest breeding rookery of this species south of Alaska. The breeding season is June and July during which time the adult males as well as the bachelors are present. During most of the remainder of the year the population consists of varying numbers of females, pups and yearlings.



Fig. 1. California sea lions hauled out along a sandy beach with a group of immature elephant seals (right foreground). Año Nuevo Island, March 24, 1962

California sea lions use the inner parts of the reefs and the sandy beaches for hauling out although they show preference for the seaward side (Fig. 1). They also come onto the top of the south end of the island, especially when their population is high. This species is present in numbers except during the breeding season which is in June and July. Only males have been recorded and most of these are adults. It is believed that they move southward to their known breeding rookeries on islands off the coast of southern California and northwestern Mexico during the summer months.

Northern elephant seals prefer the higher parts of the large sandy beach on the seaward side of Año Nuevo Island (Fig 1). This species is present throughout the year although its population changes greatly in composition and numbers at different seasons. Breeding takes place from December to February.

The harbor seal is resident throughout the year in this region. Most of the local population hauls out on rocks close to the mainland which is a half mile away but at times, when the Steller and California sea lion populations are not too high, harbor seals occur in numbers on the low rocks off the north end of the island, especially at low tide. The breeding season extends from late March to May in this region.

Because of the small size of Año Nuevo Island and the fact that the total pinniped population has been found to vary from a few hundred animals in late winter

and early spring to over 15 000 individuals in late summer and early autumn, there is necessarily considerable overlap in the areas occupied by the several species as well as close contact because of population pressure.

By the middle of May the first bull and bachelor Steller sea lions begin to arrive. This is a time when the male California sea lion population is quite high. The Steller bulls soon move into the rookery areas on the seaward side and begin to engage in fighting for favorable positions. This type of aggressive behavior increases during the succeeding weeks as the harems are formed and is maintained until the latter part of July. During the last half of May there are still many adult male California sea lions present. In 1962 there were 800 California bulls on June 5, at which time the first Steller pups were born. The Steller bulls showed no strong reaction to those California bulls that happened to be on the breeding rookeries. The latter generally did not come too close to the established bulls. When it happened that they were near Steller bulls actively engaged in battle, the California sea lions would move nimbly out of the way.

There was even closer contact between some of the last remaining California bulls and the subadult or bachelor Stellers which are kept from the breeding areas and forced to haul out on the inner reefs and sandy beaches occupied by California males



Fig. 2. A group of bachelor Steller sea lions on a sandy beach with some immature elephant seals and immature California sea lions. Several of the latter can be seen on top of the elephant seals. Año Nuevo Island, California, June 27, 1961

(*Fig. 2*). The non-breeding or non-established Steller males spend considerable time paired off and engaged in mock battle. In one instance a Steller bachelor was observed to start a mock battle with a California bull. The latter immediately reacted by barking, and advanced aggressively toward the bachelor who rapidly retreated. This was one of the few instances noted in which animosity was exhibited between rather large males of these two species even though one was a subadult.

By the time the California males return in numbers in August, most of the bull and bachelor Stellers have gone. There is then close contact between the California bulls and the Steller cows and pups. The adult males and females, representing separate species which have had no contact during the breeding season, mingle together. They may be seen hauled out side by side, even lying partly on one another (Fig. 3). Females nursing young may be seen with their heads resting on the bodies of California bulls. Occasionally the Steller females will growl and show aggressive behavior (Fig. 4). When this occurs the California bulls invariably retreat before any conflict arises. The subadult and immature male California sea lions, which constitute about 15% of the total population, may devote some time to pairing off and engaging in mock battle themselves. This consists principally in neck contact and pushing without use of the mouth and teeth.

As the Steller pups grow they move from the small tidepools in the rookeries into the sea where they swim and play in the surge channels and in areas between the rocks off the seaward side of the island. This sort of behaviour reaches its peak in late September, at which time the California male sea lion population is at its peak. The pups do much leaping out of the water onto rocks in the process of chasing each other and disturb many resting California bulls. The bull will usually raise his head, turn his neck and open his mouth as the pups race over his back but has never been seen to harm them in any way.



Fig. 3. California sea lion bulls hauled out next to Steller sea lion cows and pups. The Steller sea lion cows are light in color in contrast to the California Bulls. Some pups are to be seen on the ledge in the upper left part of the picture. Año Nuevo Island, California, September 7, 1963



Fig. 4. A group of Steller sea lion cows and pups with one of the former threatening an intruding California sea lion bull (lower left). Año Nuevo Island, California, September 1, 1962

In general, therefore, these two species are separated during most of the breeding season but during the short overlapping periods that adult males of both species are together no marked aggressive behaviour has been noted. In the post-breeding season the female and pup Steller sea lions and the male California sea lions behave essentially as one species. Frequently rafts of 50 to 200 animals in the water are composed of both species.

The elephant seals, since they frequent the sandy beaches and are present in varying



Fig. 5. California sea lion bulls and immatures in the foreground next to a group of immature elephant seals. Año Nuevo Island, California, November 13, 1963



Fig. 6. Immature and subadult elephant seals (foreground) and bachelor and bull Steller sea lions (the large individuals in the middle and upper part of the picture) mingled with male California sea lions of varying ages (those on the edge of the water are adults). Año Nuevo Island, California, June 4, 1963



Fig. 7. A group of subadult elephant seals (center) surrounded by male California sea lions. Several sea lions are on top of elephant seals. Año Nuevo Island, California, November 13, 1963

numbers throughout the year, come in close contact with the California sea lion males during more than ten months in the year (Fig. 5). They also come in close contact with some of the Steller bachelors and unattached bulls that are kept off the rookery areas during the breeding season and forced to use peripheral habitats including sandy beaches (Fig. 6). In the post-breeding season the Steller cows and some of the pups also frequent these beaches along with California bulls and elephant seals.

The elephant seals often tend to aggregate together while they are literally surrounded by thousands of sea lions. They pay no attention, however, to the latter. It is a common sight to see California sea lions, especially immature males, sleeping on top of the larger elephant seals (Fig. 7). The latter are usually subadult males, except in July when the bull elephant seals, which have been absent since late February, return for about two months. The elephant seals seem completely unaware of the presence of the smaller animals on top of them. If they roll over, the sea lions nimbly maintain their positions and assume a resting posture as soon as the larger underlying animal does the same.

In the months of December, January and February, when the elephant bulls are aggressive and active breeding is occurring they seem to pay no attention whatsoever



Fig. 8. Bull California sea lions on the right with female Steller sea lions in the water to the left and a harbor seal lying on the edge of the rock in the center of the picture. Año Nuevo Island, California, August 18, 1962

to California sea lions or Steller sea lions. The latter, however, keep away from the actual harem areas. Whether this is because it is a time when the population pressure is low or perhaps the result of aggressive action by the elephant seal bulls was not determined. Although the latter would sometimes aggressively come toward human observers, they were rarely seen attacking any pinnipeds other than other male elephant seals. Battles between the latter on Año Nuevo Island consisted principally in raising the head and trumpeting, with little of the vicious fighting seen among male Steller sea lions. This is probably because of the small size of the colony. In elephant

seal rookeries where the population is high, serious battles between males occur (BARTHOLOMEW, 1952).

Harbor seals are the most wary of the four common pinnipeds on Año Nuevo Island. They frequently haul out in small groups at low tide on the outer reefs where occasionally there are Steller or California sea lions (Fig. 8). On the inner reefs harbor seals usually rest together on ledges close to the water so that they can depart rapidly if alarmed. This no doubt is associated with their inability to move rapidly out of water as well as with their small size.

On these ledges on the inner reefs they were often seen in close contact with male California sea lions and female and pup Steller sea lions. They showed a certain amount of fear of unattached bulls and large bachelor Steller sea lions during June and July. These large males usually appeared aggressive although this was directed primarily to other males of their own species. Nevertheless, the harbor seals were very wary and behaved in a nervous manner when these roving Steller males came around. The smaller animals would move out of their way and sometimes even go into the water if the former came within a few feet of them.

Summary

Because of the general linear distribution of most pinnipeds along continental and insular shorelines, it is not uncommon to find areas where several species occur in close contact with one another. The writer has been making observations for nearly three years on Año Nuevo Island along the coast of central California where such a situation prevails. Here, occupying part of an island of slightly more than 11 acres, more than 15 000 pinnipeds, representing four species, have been observed at one time. The species involved are the Steller sea lion (*Eumetopias jubata*), the California sea lion (*Zalophus californianus*), the northern elephant seal (*Mirounga angustirostris*) and the harbor seal (*Phoca vitulina*). Although each shows preference for a habitat that is not the choice of the other three, there is necessarily considerable overlap.

The Steller sea lion breeds on Año Nuevo Island during June and July, while the California sea lion is represented there only by males from the part of July until early June. In general, these two species are separated only in the breeding season. During the remainder of the year the male California sea lions mingle freely with female and young Steller sea lions. Little animosity is exhibited. California sea lions often surround, and even sleep on top of, elephant seals without the latter showing the least concern. Harbor seals show more caution in the presence of larger animals but are often found with them.

Zusammenfassung

Infolge der allgemein linearen Verbreitung der meisten Robben entlang der Küstenlinie von Kontinenten und Inseln ist es nicht ungewöhnlich, daß verschiedene Arten in engem Kontakt miteinander vorkommen. Beobachtungen während drei Jahren auf der Neujahrsinsel vor der mittelkalifornischen Küste zeigten, daß auf dieser kleinen Insel von nur 4,5 ha mehr als 15 000 Robben in vier Arten gleichzeitig vorkommen, nämlich Stellers Seelöwe (*Eumetopias jubata*), Californischer Seelöwe (*Zalophus californianus*), nördliche Elefantenrobbe (*Mirounga angustirostris*) und Seehund (*Phoca vitulina*). Obwohl jede Art eine Vorliebe für ganz bestimmte Örtlichkeiten zeigt, die offenbar von den anderen Arten nicht ebenso geschätzt werden, überschneiden und vermischen sich die Bestände beträchtlich.

Stellers Seelöwe wirt auf der Neujahrsinsel während Juni und Juli, während der Californische Seelöwe in dieser Zeit nur durch ♂♂ vertreten ist, die von Ende Juli bis Anfang Juni dort sind. Im allgemeinen sind diese beiden Arten nur während der Fortpflanzungswochen getrennt. Während der übrigen Zeit des Jahres vermischen sich die Californischen Seelöwen-♂♂ mit ♀♀ und jungen Stellers Seelöwen. Es zeigt sich nur geringe gegenseitige Abneigung. Californische Seelöwen umgeben oft die Elefantenrobben und legen sich zum Schlafen auf diese, was die großen Robben nicht im geringsten stört. Seehunde sind bei Anwesenheit der größeren Arten vorsichtiger, werden aber doch oft mit ihnen zusammen gefunden.

Literature

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Beobachtungen zur Fortpflanzungsbiologie des Wolfes, *Canis lupus*¹

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1963 wurden im Tierpark Berlin auf knapp 3000 m² großer Freianlage 6 europäische Wölfe geboren und ihre Entwicklung und Aufzucht innerhalb der Familie, bestehend aus 1 Rüden, 1 Altfähe und ihrer 1961 geborenen Tochter, beobachtet. Die Wolfsfreianlage (Abb. 1) ist durch reichen Baumbestand und hohen Graswuchs gekennzeichnet. Sie wird im Westen und im Süden von einem Wassergraben umgeben, die östliche Gehegegrenze bildet ein 2,75 m hoher Maschendrahtzaun; nördlich begrenzen die Innenkäfige, die sich hinter ungefähr 5 m hohen Felswänden befinden, das Freisichtgehege. Der Besucherweg zieht sich diesseits des Wassergrabens entlang. Beobachtet wurde von verschiedenen Stellen aus: einmal von der Besucherseite B 1, 2, 3, was das natürliche Verhalten der

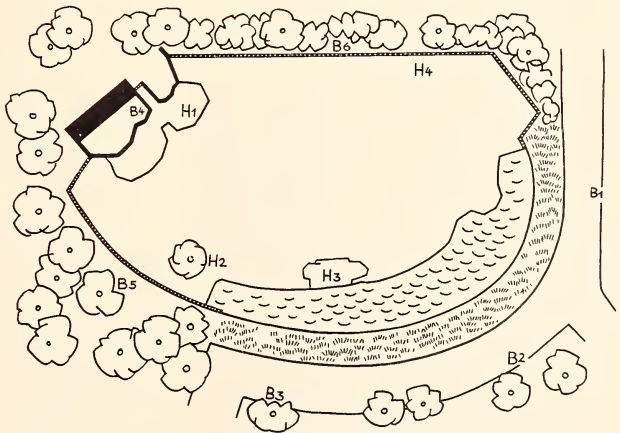


Abb. 1. Wolfsfreianlage (Zeichnung: ZIEGER)

Wölfe am wenigsten stören konnte, zweitens von den Felsen herunter B 4, von wo ein guter Überblick über die Freianlage gewährleistet war und was von den Wölfen selten bemerkt wurde, infolge der auch von BATTEN beschriebenen Eigenschaft mancher Raubtiere einschließlich der Wölfe, daß sie selten nach oben schauen und dadurch einen Menschen nicht leicht wittern, wenn er sich über ihnen befindet. Weiterhin wurde von einigen Plätzen B 5, 6 direkt hinter dem Maschendrahtzaun beobachtet.

¹ Dr. ERNA MOHR zum 70. Geburtstag gewidmet

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