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OBSERVATIONS ON BEHAVIOR AND POPULATIONS OF OYSTER-CATCHERS IN LOWER CALIFORNIA

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The following observations of oyster-catchers were recorded mostly during April and early May of 1946 along the Pacific shore of the northern half of the peninsula of Lower California. They are concerned largely with the distribution and behavior of the mixed population of Pied and Black oyster-catchers (*Haematopus ostralegus frazari* and *H. o. bachmani*) of that area. These two forms have long been regarded as distinct species, but they are now known to hybridize or intergrade.

POPULATIONS

The number of oyster-catchers inhabiting the northwest coast of the peninsula and adjacent islands appears to have become somewhat reduced in some areas since previous observations near the beginning of the present century. In other areas little change is indicated. My observations duplicated, in general, those recorded by earlier observers concerning the interbreeding of typical *bachmani* and *frazari*, producing intermediate individuals in this area. On rocky shores *bachmani* appears more abundant while *frazari* predominates on sandy areas.

I visited Los Coronados Islands twice in the spring and summer of 1946. On March 27, I visited the North Island only and saw no oyster-catchers. Likewise, I saw none here when I returned to the island on July 22, 1946. Grinnell and Daggett (1903:33) stopped at this island in August of 1902 and found both "species" present.

On July 23 and 24, I visited both of the small middle islands and found six oyster-catchers which appeared to divide their time between the two small islands. At least two of the birds were immature. One of the adults was typical *bachmani*, while the others ranged through intermediate forms to almost typical *frazari*. I found a dead immature bird well back in a dark cave on the small middle island.

Although the population on the Coronados appears to have become reduced in size since the early nineteen hundreds, Mr. L. M. Huey (letter, 1948) states that he has observed a fluctuation from year to year in the number of birds inhabiting the islands during his more than thirty years of experience in this area. This fluctuation in numbers was definitely the result of collecting in one instance. The birds appear to re-establish themselves relatively slowly, probably because this area is quite a distance from the center of abundance, a hundred or more miles south of the Coronados.

I was on San Martín Island from the 4th through the 8th of April, and during this time covered its coast line carefully. However, I failed to find any oyster-catchers. Kaeding (1905:111) found them common here in 1897 as did Gifford (1913:53) in July of 1905. It is interesting to note that the Osprey (*Pandion haliaëtus*) shows a great decrease in population on this island in the same period (Kenyon, 1946:153).

While on the small rocky island of San Geronimo, April 11 to 14, I found a population of three mated pairs of oyster-catchers. Four of these birds appeared completely black while two were intermediate or pied individuals. One of the latter had a completely

white belly, while the other had an irregular white patch on the breast and belly. Two of the dark-colored birds were mated, while each of the other two pairs included a dark and a pied bird. Willett (1913:22) stated that he collected a similar pair of birds here. Gifford (1913:53) recorded that during his visit on July 13, 1905, twelve Black and eight Pied oyster-catchers were counted. If the nesting season of 1946 was successful, the July population on the island was probably close to the population found by Gifford.

Scammon Lagoon supports the largest population of oyster-catchers of any of the



Fig. 32. Sand and shell spit, Shell Island, Scammon Lagoon, showing type of beach used by nesting oyster-catchers of this area.

areas I visited. Shell Island (the names used for the small islets of this lagoon are those commonly employed by the fisherman of the area), the largest and most thickly populated islet, had 23 mated pairs. Apparently several unmated individuals occupied the island also. Two birds from this entire group were entirely black. These individuals occupied territories at quite a distance from each other. Both had mates which appeared to be typical *frazari*.

Three other islets in this lagoon, which I visited, supported smaller populations. Rock Island, which was infested with coyotes, had four pairs, Nest Island an estimated eight pairs, and Box Island an estimated twelve pairs. Short visits only were made to the last-named islets, thus an accurate count was not possible.

The total population of the area of Scammon Lagoon thus consisted of approximately 47 pairs. In addition to these I saw a few birds which appeared to be unmated. Bancroft (1927:51) estimated that in Scammon Lagoon "There are at least two or three hundred oyster-catchers fairly evenly distributed over the islands we visited . . ." In 1946 the coyotes on Rock Island may have accounted for quite a reduction in the population of that island. The birds of Scammon Lagoon, as nearly as could be observed in the field, were mostly typical *frazari*, the others showing variable amounts of dark coloration. I saw only the two completely black specimens mentioned above.

Several pairs of oyster-catchers, all showing a good deal of white, inhabited the southeastern end of Natividad Island. I made no attempt to explore completely the steep

and rocky coast line of this island. Thus, even the estimate of four to six pairs here was largely a guess. Chester C. Lamb (1927:70) remarks on the oyster-catchers of Natividad that equal numbers of black and pied individuals were present. In 1946 the island was heavily infested with house cats. It is possible that the oyster-catchers as well as the Black-vented Shearwaters, *Puffinus opisthomelas*, which nest there are suffering from their depredations.

NESTING IN SCAMMON LAGOON

On April 20 I carried out quite a thorough search for eggs on Shell Island (fig. 32). This island is a low sand and shell (*Pecten circularis*) spit approximately three-quarters



Fig. 33. Nest of the Pied Oyster-catcher, Shell Island, partly protected from wind by a piece of dried gut of a green turtle. Photo by Milo W. Williams.

of a mile long. Because of tidal action, its shape is variable, and no accurate charts of it are available. At no point is it more than two or three feet above high water and on its eastern side, it is bordered by a salt marsh and sand flats.

Egg laying apparently began about the 20th of April in the Scammon Lagoon area. A number of nests, frequently within a few feet of each other, had been completed and appeared ready to receive eggs. Many of these were probably "play nests" (nests built during courtship but not used for eggs). I found only two nests with eggs. Each contained one egg. A Mexican fisherman, who had frequently hunted for eggs of the Royal Tern (*Thalasseus maximus*) in the previous weeks, accompanied me and appeared quite surprised at this new type of egg, which he said he had not found before. By the 24th of April we found seven nests with eggs. These all belonged to birds appearing to be typical *frazari*. By the 26th, when I made the last general tour of the island to check on these nests, I found that two of those discovered on the 23rd with one egg still contained only one egg. The other five each contained two eggs (fig. 33). Apparently the Frazar Oyster-catcher of this area averages fewer eggs per clutch than the Black Oyster-catcher of the Sitka region which Webster (1941:142-143) studied. He found that of thirteen first sets examined the average number per set was 2.69 eggs.

After April 24, I was unable to spend time searching for additional nests. A nest on a finger of sand near the fishermen's camp was under intermittent observation until May 6. During the night of May 2 an exceptionally high tide flooded areas which had apparently not been touched by tidal water previously during the season. The water

covered the nest occupied by this pair of oyster-catchers. On the morning of May 3, when I again visited the nest, I found that the birds had moved their eggs up the gently sloping sand and shell beach a distance of seven feet and were incubating just beyond the high-water mark.

Wishing to observe the birds more closely, I set up my burlap blind about ten feet from this new nest site. The birds shied away from the blind, refusing to approach close enough to sit on the eggs. However, after circling the area several times, meanwhile pecking at the sand and indulging in several piping performances, the bird desiring to incubate approached the eggs and settled on the sand about six inches from them. The eggs were thus just within reach of the tip of the bill. Reaching over an egg with the bill it was rolled across the sand and tucked under the breast feathers. After an interval of three minutes, during which time the bird gazed steadily at the blind, the other was procured in the same manner.

High tides occurred again during the nights of May 3 and 4. When I last visited the nest on May 5, I found that the high tides had forced the oyster-catchers to move their eggs even farther up the beach. They now rested ten feet from the position of the original nest.

Despite the many disturbances forced on these birds by the tide, the proximity of the fishermen's camp, and by my observation blind, they continued to incubate all day on the 5th. On the 6th they appeared to lose interest in their eggs. Both birds continued to remain in their territory during the day and engaged in frequent piping performances between themselves and the neighboring pair. Early on the morning of May 7, we left Scammon Lagoon, ending my observations on this nest.

Territorial behavior was observed as frequently as possible in an attempt to chart accurately the nesting territories held by the various mated pairs (fig. 34). "Play nests" were found in all of the areas charted. Although the small size of the low sandy island, approximately three-quarters of a mile long, caused the birds occupying it to crowd their home areas rather closely together, the feeding grounds were widely dispersed. During low water many miles of sand flats were exposed in all directions from the island. As the tide receded the birds waited patiently for their particular feeding ground to become exposed, then left quietly, either singly or in two's, taking a direct route for the distant feeding area.

The pair of oyster-catchers mentioned above and easily seen from the fishermen's camp was the one most frequently watched. On several occasions I saw them leave for the feeding grounds together, apparently relying on the sun to keep the eggs warm in their absence. Webster (1941:150) found that the Black Oyster-catchers of the Sitka region did not leave their eggs uncovered even on the warmest days.

One afternoon when the sun was shining and the tide was out and both oyster-catchers of this nest were feeding on the sand flats, I watched a Raven (*Corvus corax*), which was picking over a heap of green turtle shells and bones near the fishermen's camp. Suddenly taking to the air he headed directly for the oyster-catchers' nest. He glided low over the sand but instead of flying to the nest, alighted on the beach about fifty feet from it, then proceeded to amble toward the unprotected eggs. Neither of the oyster-catchers was in sight when the Raven alighted. As he took his first steps toward the nest I caught sight of the pair rapidly flying toward their nest. They skimmed low over the distant sand and water patches and looked so far away that it seemed they had little chance of reaching the Raven before he found the eggs. Yet the birds arrived while the marauder was still five or six feet from his objective. The first of the pair took up the attack by making a low sweep at the Raven while the other bird added its shrill calls

to those of its more aggressive mate. The Raven ducked, frantically prostrating himself, so that a little white splash of sand was thrown up where his bill hit. After delivering the initial attack the oyster-catcher pulled sharply upward completing a steep, 180-degree, climbing turn, which brought it again into position to deliver a fresh attack. The attacks were delivered up wind. Five low sweeps were completed before the Raven took flight. Between each dive he continued to amble toward the nest, throwing himself flat on the sand each time it seemed that the swooping oyster-catcher would hit him. When finally driven away the Raven was within a foot or two of the nest.



Fig. 34. Sketch-map of Shell Island, Scammon Lagoon, showing approximate territorial boundaries (broken lines) of the 23 mated pairs occupying the island in spring of 1946. The beach line is indicated by a solid line. A small square near south end indicates location of fisherman's camp.

As soon as the Raven was in the air both birds pressed an angry assault. The aerial attacks were delivered as "lowside beam runs"; that is, the attacking bird flew at the Raven from the side and slightly below, coming so close that at least once the wings of attacker and attacked met with an audible slap. After each assault the attacking bird pulled sharply up to an altitude of 20 or 30 feet above the Raven, completing a steep climbing turn, then after flying back across the flight path of the Raven it entered a steep dive, making another pass. The attacks were continued with constant loud cries until the Raven had been driven 100 yards or more from the nesting territory.

Apparently the egg-robbing technique of the Ravens of the Sitka region is more successful. According to Webster (1941:146) Ravens wait on an elevated position, then

fly directly to the nest and spear an egg while the oyster-catchers are involved with other marauders. No elevated places are available in Scammon Lagoon from which to watch, thus the Raven perhaps did not know the exact location of the nest and could not fly directly to it.

After driving the Raven away the oyster-catchers returned to their nesting territory and indulged in a typical piping performance. The bills were pointed stiffly and at a sharp angle downward, tips just clearing the sand, the neck feathers were ruffled, the tail was pointed sharply upward and the wings drooped. Holding this posture the birds ran about near each other in a stiff little dance, uttering a sharp piping call.

The enemies of the oyster-catchers in Scammon Lagoon appear to be limited to the Raven and the Western Gull (*Larus occidentalis*). The Ospreys and oyster-catchers nest in close proximity, showing no concern for one another. The Ravens probably do more damage than the gulls since they appear to remember the location of the nest to some extent while the gulls do not. The latter birds frequently flew over oyster-catchers' nests both while the birds were incubating and while the eggs were left uncovered, yet the only time that the gulls actually showed an interest in the eggs was when the oyster-catchers were defending their territory from the Ravens. Only one nest which I found on Shell Island was destroyed. This particular nest was the nearest to the fishermen's camp and the birds were constantly disturbed.

PIPING BEHAVIOR

The piping performances, both aerial and terrestrial, which are engaged in as expressions of many emotional situations, appear to be quite similar in the birds of Scammon Lagoon to those described for other members of this genus by Huxley and Montague (1925) and others. The Black Oyster-catchers of the Scammon Lagoon area took part in piping performances with typical individuals of *frazari*. The behavior and vocal expressions of the two were identical as far as I was able to tell. During my stay in Scammon Lagoon, it was usual to see from two to six oyster-catchers engaged in a piping performance. Such groups would fly in close formation out over the water, then return to the beach where they would assume the typical piping posture as already described.

The two pairs occupying territories nearest the fishermen's camp joined together in their piping performances. After the initial flight they usually landed at a point through which an invisible line between their two territories appeared to pass. Here the members of opposing pairs would face each other and go through a typical piping dance. These performances continued after the already mentioned destruction of the eggs of one pair.

The oyster-catchers continue their activities at all hours of the night. Unfortunately, the sky in the vicinity of Scammon Lagoon was invariably heavily blanketed with clouds at night during our stay there. For this reason I could only depend on sounds to know what the birds were doing. Judging from their calls they engaged in piping flights much the same at night as those observed in the daylight. We lay at anchor about 200 feet from the beach. The calling birds circled out around our position, then back to the beach.

SUMMARY

The population of Pied and Black oyster-catchers along the Pacific shores of the upper half of the peninsula of Lower California, Mexico, appears in some places to be unchanged; in other areas it is reduced from that recorded by others in this region in the early part of the present century. One outstanding case was noted: The island of San Martin had no oyster-catchers in 1946 whereas in past years it had many birds.

Scammon Lagoon harbors the most concentrated breeding population of oyster-catchers. An estimated 47 pairs were observed in this area in the spring of 1946.

In 1946, egg-laying began about the 20th of April in the Scammon Lagoon area. Of seven nests observed until egg-laying had been completed, five had two eggs and two contained one egg only.

A pair of oyster-catchers moved their eggs a distance of ten feet in a period of approximately three days to avoid high nocturnal tides. An oyster-catcher was observed to move its eggs by rolling them with the tip of the bill.

Although the nesting areas are close together, the feeding grounds of the individual pairs are widely separated from them. Sometimes both birds of a pair will leave their eggs and visit the feeding grounds together.

Oyster-catchers followed definite patterns of attack while driving a Raven away from the nesting territory.

Piping performances were observed frequently after egg laying had taken place. The few Black Oyster-catchers seen followed the same behavior patterns, as far as observations were carried, as did the Pied Oyster-catchers with which they were mated.

The oyster-catchers of Scammon Lagoon apparently made frequent nocturnal flights. These flights were accompanied by the vocal sounds typical of the diurnal piping performances.

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