HISTORY OF A NESTING COLONY OF CASPIAN TERNS ON SAN FRANCISCO BAY

WITH THREE ILLUSTRATIONS

By DUDLEY S. DEGROOT

It was in 1924 that information was first brought to Mr. Chase Littlejohn, veteran naturalist of Redwood City, that a colony of Caspian Terns (*Hydroprogne caspia imperator*) was breeding somewhere in the southern reaches of San Francisco Bay. The man who brought Mr. Littlejohn the information stated that a few of the birds had been noted in 1922 and again in 1923, but it was not until 1924 that they became numerous. He was asked to bring in a few of the eggs the next time he came to town, which he did the following week. These eggs, together with a vivid description of the birds, convinced Mr. Littlejohn and myself that Caspian Terns were breeding in the Bay district. It was not until July 4, 1926, however, that we were able to affirm positively our earlier convictions, by making a trip to the nesting colony.

Leaving Redwood City by automobile about five-thirty on the morning of the fourth it did not take us long to reach a group of salt ponds on the southeastern side of the Bay, where the colony had previously been located. These ponds were enclosed and subdivided by a series of dikes or levees and it was upon one of the latter that the birds had been reported nesting. The question was, which one of the many miles of dikes had the birds selected: not an easy problem, as the dikes all looked exactly alike. With the aid of a field glass we eventually picked up a rather steady flight of birds all of which seemed to be headed toward a single point on one of the dikes, some half-mile distant. Upon closer scrutiny of this particular area we were quite sure that we could see a closely massed colony of nesting birds.

Eagerly anticipating the pleasure of stepping into the center of a breeding colony of this species we put on "full steam ahead." As we approached our destination we could clearly see an ever increasing number of terns flying to their breeding grounds. Several of them came quite close to us, making it possible to identify them as Caspian Terns. Each one seemed to be heavily laden with fish, which evidently it was carrying home to a hungry family.

When we were still a hundred yards from the colony all of the adults sailed into the air emitting a rather startling, if not terrifying, chorus of tern blasphemy. The more daring members came right out to meet us, some of them actually swooping down to within a few inches of our heads. Each time one darted at us it let out a raucous war cry which in itself was enough to intimidate a person not acquainted with the antics of nesting birds.

When we reached the colony proper we were greeted by a sight which would delight the heart of any ornithologist. Stretched out over a distance of about a hundred yards, and covering the entire top of the narrow dike, were over a hundred and fifty nests containing young of all sizes, as well as a few late sets of eggs. The dike at this point was approximately twenty-five feet wide, with a flat crown some ten feet in width. The latter was not more than four feet above the water line at any point. More than half of the nests were located on top of this crown. A few were found along the east slope, some two feet above the water line, while still fewer were situated along the windy, west slope not more than a foot above the water level.

The nests in every case consisted of mere depressions in the soft, spongy, marshy soil. No nesting material of any sort was noted. In a good many instances the

eggs seemed to be partially buried. This we attributed to the severe westerly winds which blow in this section of the Bay throughout the year, especially in the spring and early summer.

A good many eggs, well over fifty, were found in the water at the edge of the dike on the east slope. These had evidently been blown out of nests which had not been excavated to a sufficient depth. The force of the wind is often so great in this particular region that there is no question but what the eggs not set down in nests excavated well below the surface level of the dike would stand little chance of being hatched.

At this late date, of course, most of the nests contained young although a number still contained eggs. The young were in all stages of growth. Evidently soon

Fig. 38. THE COLONY OF CASPIAN TERNS ON SAN FRANCISCO BAY. PHOTOGRAPHED BY JOSEPH MAILLIARD IN MAY, 1931.

after hatching they get up and walk about the dike, for in few nests, and these exceptions invariably contained just-hatched young, did we find nestlings of anywhere near equal size. A typical nest would contain one youngster two weeks old, another a week old and a third not more than a few days old. Subsequent examinations of sets of eggs on the point of hatching has shown that all eggs in a single set normally hatch within a few hours, or at the most a day, of each other.

We observed young frequently running from one nest to another, while some of the more daring and older individuals ran and rolled down the banks of the dike to the water where, after a brief swim, they would come back to land and occupy any conveniently located nest. On every visit to the colony a dozen or more dead

nestlings have been noted scattered indiscriminately throughout the colony, which indicates rather clearly that infant mortality in this particular colony is a fairly serious factor. A majority of the dead seem to be several weeks old although newly hatched dead are also quite common. The young are of two distinct color phases: a tan or fawn color and a downy, dull, white. Often a chick of each color will be found in a single nest although, customarily, any one nest contains young of but one color.

Fish of several varieties and many sizes were noticed in nests containing young, indicating that there was an abundance of food for all. A good many fish were found dropped indiscriminately along the top of the dike. We watched with great interest the disgorgement of whole fish, four to eight inches in length, by parent birds, much to the edification of their ravenously hungry offspring.

Of the thirty nests containing eggs twenty-five contained two each, two contained one each and three contained three each. All of these were evidently quite heavily incubated. Two young occupied a majority of the nests in which the eggs

Fig. 39. A TYPICAL NEST AND EGGS OF CASPIAN TERN IN THE COLONY ON SAN FRANCISCO BAY. PHOTOGRAPHED BY EMERSON A. STONER, MAY 14, 1931.

had hatched, although three was not an uncommon number. Four were noted in not less than half a dozen nests while a relatively few contained lone nestlings. The number of young in nests I believe is of rather questionable significance, however, because, as I have indicated above, as soon as the nestlings are able to walk they wander about from nest to nest quite promiscuously.

Summary for 1926. The area occupied by the colony was a space less than 100 yards in length by 25 in width. Total number of occupied nests counted, 164. This did not include many "hollows" which had evidently been used but which at this date contained neither eggs nor young. Total number of young counted, 210. Average estimated age of young, two to three weeks, ranging from many just hatched to others which were undoubtedly a month old. Estimated (from rough count) number of adults seen, 350.

In 1927, Mr. Littlejohn made a trip to the colony on June 6, while I visited it in company with Mr. George Culver of Stanford University on June 11. Much to our satisfaction we found that it had grown and prospered, as the following figures will indicate. Instead of the single solid colony which we had located in 1926, we found that a second and smaller colony had been established some thirty yards south of the original site. Sixty-five occupied nests were counted in this new addition,

twenty-seven of which contained young from a few days to two weeks of age. The remainder of the nests apparently contained eggs well along in incubation. This entire, new addition seemed to be several weeks ahead of the parent colony, from the standpoint of incubation of eggs. Of the nests containing eggs twenty-four had two each, ten one each, and three three each.

The main colony consisted of 138 occupied nests located in an area seventy-five yards in length. Forty-nine nests contained two eggs each, twenty-six three each, twenty-four one each, five four each, and the remaining 34 contained young. A majority of these had just hatched.

The total number of nests for 1927 was therefore 203 or a gain of 39 over the total for 1926. As in 1926, there were many eggs in the water along the edges of the dike and especially along the east side.

Fig. 40. AN UNUSUALLY LARGE SET OF EGGS OF CASPIAN TERN IN COLONY ON SAN FRANCISCO BAY. PHOTOGRAPHED BY G. D. HANNA IN MAY, 1931.

CHRONOLOGICAL ACCOUNT OF THE COLONY INCLUDING RECORDS SINCE 1927

The tern colony was first discovered in 1922 by an unknown workman. Seven nests were located on a dike some two miles from the present location. Some Japanese laborers robbed these first nests and so far as is known no young were raised. In 1923 evidently only two pairs of birds appeared. They nested at the same spot as that occupied the previous year, but the heavy winds of early June dashed water over the top of the dike and washed the eggs away. In 1924 a dozen pairs of birds successfully reared their families on a new nesting spot (the present site), which was more advantageously situated both from the standpoint of winds and of isolation from human interference.

In 1925 the colony undoubtedly increased in numbers although just how much this increase amounted to is not definitely known. Reports which came to us indicated that there were between thirty-five and fifty breeding pairs.

On July 4, 1926, there were 164 occupied nests actually counted by Mr. Littlejohn and the writer, which does not include some fifteen or twenty nesting "hollows"

which had undoubtedly been used. On June 11, 1927, 212 occupied nests were actually counted by George Culver and the writer, with an additional number of "hollows" which either had been used or were to be used soon.

In 1928 the writer was in Santa Barbara but managed to make a hurried trip to the colony on June 14, accompanied by Harry Carriger. On this visit 242 occupied nests were counted, with the usual number of unoccupied nests. In 1929 the colony was not to my knowledge visited.

On June 8, 1930, Mr. Littlejohn and I again visited the colony. Much to our surprise the smaller offspring colony which had made its appearance in 1927 had disappeared and once again there was a single large colony where 296 occupied nests were counted along with the usual number of unoccupied ones.

In 1931 Mr. Littlejohn and I visited the colony, in company with my wife, on June 3, when 287 occupied nests were counted with an additional 30 or 35 unoccupied ones. Approximately 75 loose eggs were noted along the eastern water line. I again visited the colony on June 23 for the purpose of taking moving pictures of the young and adults. Only 135 occupied nests were counted on this trip, although there were countless numbers of young running and hiding about the dike, as well as swimming around in the water. There were about twenty nests containing eggs which, judging from their color and cleanness, had recently been laid.

Mr. Emerson A. Stoner and Harry Carriger made a trip to the colony on May 14, 1931, at which time they counted 167 occupied nests and many others yet unoccupied. Those which were occupied contained from one to four eggs each, no young being noted.

During the latter part of May, 1931, Mr. Joseph Mailliard, accompanied by Dr. G. Dallas Hanna, was escorted to the colony by one of the workmen who is employed by the salt company and who lives less than two miles from the colony. Driving up to the colony in an automobile, which is an experience the writer has not had, they were able to approach to within fifty feet of the nesting colony without seriously disturbing the birds. From this vantage point, and using the car as a blind, they secured some excellent pictures of the colony (for example, fig. 38). On this visit 228 occupied nests were counted, the greatest number of them containing two or three eggs each.

As the nesting colony of Caspian Terns here described is located on private property it is reasonable to suppose, barring of course some major catastrophe, that it will continue to increase in numbers through the years to come. Evidently the food supply is ample; protection from animal enemies is reasonably good, and there seems to be no serious menace from man to the future welfare of the colony. Nesting apparently commences early in May and continues on through June and up until the middle of July. The height of the breeding season is reached, I should say, during the first or second week in June. Just when the birds make their first appearance in their nesting region, when they leave for their winter quarters, and where they winter are facts which have not yet been determined but which we hope to clear up in the future. The colony offers an unusual opportunity to carry on an excellent piece of work in bird-banding, of which we hope to take advantage this summer.

In closing I should like to add a word of thanks to Mr. Joseph Mailliard, Dr. G. D. Hanna and Mr. Emerson Stoner for forwarding me their photographs of the colony. And to Chase Littlejohn, of course, must go all credit for the discovery of this colony.

Menlo Junior College, Menlo Park, California, July 1, 1931.