

BREEDING BIRDS OF A WHITE MOUNTAINS LAKE

WITH FOUR ILLUSTRATIONS

By E. A. GOLDMAN

THE WHITE MOUNTAINS of Arizona rise steeply from near the southern edge of the Mogollon Plateau in the extreme eastern part of the state. The plateau here slopes upward on the north from the Little Colorado River Valley to a general level at 8,500 to 9,000 feet, skirting the higher mountains where the country is largely open, rolling prairie, interrupted here and there by wooded ridges and low peaks.

Mount Thomas, more familiarly known as "Old Baldy", the dominant peak of the White Mountains, reaches an altitude of 11,496 feet. Nestling in a little valley at about 9,000 feet, near the eastern base of this mountain lies Marsh Lake, locally known also as "Big Lake." Although not large in the ordinary sense as applied to lakes elsewhere, Marsh Lake covers a sizeable area for the generally dry, well-drained region in which it is located. Along the southern shore a Canadian zone forest of firs and spruces extends from the flank of the mountains down to near the water. From the northern rim of the slight depression holding the lake, the outlook is over the rolling-prairie surface of the plateau.



Fig. 42. INTERIOR OF MARSH LAKE, WHITE MOUNTAINS, 9000 FEET ALTITUDE, ARIZONA, JUNE 20, 1915; SHOWS PLANT ASSOCIATIONS AFFORDING NESTING COVER FOR WATERFOWL.

Field work for the Biological Survey during the early summer of 1915 by Dr. Hartley H. T. Jackson and the writer included visits to Marsh Lake, where investigations largely of nesting waterfowl were carried on from June 12 to June 25, and from July 19 to July 21. At the time of our first visit recently melted snow and rain had left the plateau boggy and barely passable for our wagon outfit. Small receding

banks of winter snow still lay in sheltered places near the lake. The lake was about a mile and a half in greatest length and a little more than half a mile in greatest width. A small stream, one of the headwaters of the Salt River, was flowing out near the northeastern corner. The lake is very irregular in contour, owing to sinuous shore lines. We found open water three or four feet deep; but the greater part was marsh consisting largely of sedges standing in water varying from a few inches to ten feet or more in depth. The extent of the marsh evidently varies with the dryness of the season. Patches of tules were growing along the edges of the open water.

With the aid of a canvas boat, hauled about 110 miles from the railroad, we were able to penetrate all parts of the lake area, and to make fairly complete collections of the nesting waterfowl and their eggs. Marsh Lake is of special interest as there are few places where so many species of water birds find favorable nesting conditions at so great an altitude. Recent drought years and over-grazing by domestic stock may have lessened the value of this body of water, however, as a breeding place for these birds.



Fig. 43. NEST AND EGGS OF AMERICAN EARED GREBE AT MARSH LAKE, WHITE MOUNTAINS, ARIZONA, JUNE 14, 1915; LOCATED AMID COARSE SEDGE IN WATER ABOUT TWO FEET DEEP.

Among the birds whose known breeding ranges were, through our records, materially extended are Ring-necked Duck and Virginia Rail. The following list includes only species dependent upon an aquatic environment.

Colymbus nigricollis californicus. American Eared Grebe. About one hundred eared grebes were breeding or preparing to breed. On June 14 we found a colony nesting in the marsh near the open water along the southern side of the lake. Jackson counted twenty-three nests in a space fifteen feet wide and about sixty feet long. No young were seen and a number of nests contained incomplete sets of eggs. On June 20 I revisited the place and found several new nests and several others in the course of construction. The nests were floating masses or platforms of sedge in water about

one and one-half feet deep, partially concealed in tall growing sedges. At some nests the eggs were partially or completely covered with nest material placed by the parent on leaving; at others the eggs, ranging from two to four in number, were exposed. Three eggs to a nest was a common number. Most of the eggs were deeply stained by the wet nest material. Whenever we approached the nests the birds hovered not far away in the open water watching us suspiciously. When we returned to the locality on July 19, we noted that the number of adults in the open water appeared to be about the same as during our stay the previous month. A few young only were seen; perhaps they were not yet venturing out in numbers into the open water.

Sternula albifrons antillarum. Least Tern. A single bird, shot as it flew past the boat on June 15, was the only one seen and it showed no signs of breeding.

Anas platyrhynchos platyrhynchos. Mallard. About twenty pairs were noted in the vicinity of the lake, some of them flying about in small flocks and apparently not yet breeding as late as June 21. Mated pairs were, however, seen as early as June 12. A set of eight eggs, very slightly incubated, was taken on June 16, and the female shot as she flew off. The nest was a rather shallow structure of sedge leaves placed in the



Fig. 44. NEST AND EGGS OF CINNAMON TEAL ON SHORE OF MARSH LAKE, WHITE MOUNTAINS, ARIZONA, JUNE 14, 1915; A DEPRESSION IN GREEN GRASS, LINED WITH DOWN.

green sedge on ground several inches above the water line. The nest was bordered with a few feathers. Another nest found was similar in structure and location. The mallards were wild and usually difficult to approach near enough to shoot.

Querquedula discors. Blue-winged Teal. I shot a single male as it rose out of the sedge in the marsh on June 14. A female killed by Jackson on June 12, in the same vicinity, may have been its mate. No others were noted by either of us.

Querquedula cyanoptera. Cinnamon Teal. We estimated the number of Cinnamon Teal at sixty pairs. No other species of duck at the lake approached this in abundance.

They were usually seen in pairs, except when females were flushed from nests. I found at least a dozen nests in the marsh, and among those located by Jackson was one on the nearly bare shore of the lake. The nests were of sedge, deeply cup-shaped, usually well concealed, and the interior heavily bordered with down with which the parent sometimes completely and evenly covered the eggs on leaving the nest. A nest found on June 14 was barely clear of the water; the nest freshly made of green sedge contained two eggs which were wet underneath. Another nest found on the same date, also barely above the water, was of dried sedge and contained five eggs. A nest found June 19 contained nine fresh eggs. This nest was placed in short sedge on ground clear of water but within six feet of the open lake. It was heavily lined or bordered with down carefully arranged on the inner side high over and partially covering the eggs, the open space in the center barely large enough to hold the sitting bird. The Cinnamon Teal were not so wild as the other ducks seen at the lake and a number of pairs were left unmolested. When in the water they often allowed us to approach quite near before flying, and brooding females sometimes allowed us to approach to within a few feet.

Spatula clypeata ? Shoveller. On June 13 Jackson found a nest that he believed to be of this species. It was in the barren pastured hillside at the northeast end of the lake, about a quarter of a mile from open water and fully forty yards from the nearest marsh grass. The bird was wild and left the nest usually before he had approached within two hundred yards. Several attempts were made to secure the brooding female, but each time it evaded being shot, and finally abandoned the nest, about June 18. The nest, containing seven eggs, was placed under the edge of a small rock, and was composed of down placed upon a base of grass. After the nest was abandoned the eggs, which were originally a bluish olive-green, bleached to a buffish color.

Erismatura jamaicensis. Ruddy Duck. About a dozen pairs of Ruddy Ducks inhabited the marsh. They spent much time concealed in the marsh or in the small patches of tules, and were seen only occasionally in the open water. A nest containing six eggs was found on June 14, but the parent was absent. The nest was revisited several times and always found uncovered. To determine the owner I finally set a trap and caught the female on June 19. The nest was placed on a well drained spot in the marsh within six feet of open water. It was a shallow structure of sedge with a little down intermixed. Another nest found on June 25 also contained six eggs. It was placed in a bunch of large green sedge standing in water four inches deep, the nest elevated enough to be dry, but shallow. It was lined with a few feathers. I was unable to find the sitting bird on the nest and resorted to trapping as in the preceding instance.

Nyroca americana. Redhead. A flock of six redheads (three males and three females) was seen by Jackson on several occasions. The birds were wild and difficult to approach. On June 22, however, he saw a female dive under the boat, near the shore, and at first mistook it for a grebe. As it swam out into deeper water, raising its bill above the surface, it was recognized and secured. The ovaries showed that the bird would have begun laying in about ten days or two weeks.

Perissonetta collaris. Ring-necked Duck. About fifteen pairs of this duck were noted. They were rather wild and hard to approach except when females sitting on full sets of eggs allowed us to come near before flying off. A nest found on June 19 was built of sedge and placed in the marsh close to open water on ground from which the water had, however, receded. The nest was moderately deep and well bordered inside with down. It contained seven eggs. Another nest, with two eggs when found on June 13, contained seven eggs on June 21. It was placed in the marsh where the water underneath was about an inch deep. Between June 13 and June 21 I visited this nest several times, noting the increase in the number of eggs but not the exact dates they were laid. But the brooding bird was not detected on the eggs until the latter date, when she allowed me to approach to within twenty feet and was shot as she flew off. Sometimes I found the eggs partially covered with nest material, apparently hastily drawn over them by the bird in leaving. Ring-necked Ducks were seen several times flying about in small parties apparently consisting of several pairs.

Botaurus lentiginosus. Bittern. The single bird collected was shot as it flew from the marsh on June 16. No others were seen. The specimen proved to be a female with ovaries slightly enlarged.

Rallus virginianus. Virginia Rail. Jackson found a nest of a Virginia Rail containing twelve eggs on the evening of June 20. He had been lying in the marsh grass awaiting a chance shot at some mallards when he heard a peculiar "chuckling quack" back of him and started to discover its source. He was walking slowly through the dense grass when he felt the bird slip from under his bare foot as he was about to step on the nest. The bird ran about fifteen feet through the grass, then flew a short distance at right angles and dropped into the grass again. The nest was well concealed, built up some five inches above the shallow water of the marsh and fastened to the sedge stems. It was composed of dry sedge leaves and was but slightly hollowed. Two steel traps (no. 1) were set at the base of the nest, and on the morning of June 22 the male bird was in the trap. The following day (June 23) the female was caught.

Porzana carolina. Sora. It is difficult to give an accurate estimate of the number of these birds inhabiting the marsh. They were shy and very seldom seen (two only were flushed in the course of all our work) but their call notes were heard here and there throughout the marsh. The ordinary note, *e-e-k—e-e-k*, was heard at very frequent intervals during the day and very often during the night. The rattling note was heard less often. I found three nests, the first on June 14. The female was trapped at the nest and the eight fresh eggs were taken the next day. Another nest containing nine eggs was found on June 21. The female sitting on the eggs allowed me to approach to within three feet when she slipped off and darted quickly out of sight along a runway leading off through the marsh. She was soon caught in a trap set. A



Fig. 45. NEST AND EGGS OF RING-NECKED DUCK AT MARSH LAKE, WHITE MOUNTAINS, ARIZONA, JUNE 21, 1915; LOCATED IN GRASS AND SEDGE WHERE WATER WAS ABOUT ONE INCH DEEP; DEPRESSION MODERATELY DEEP AND BORDERED WITH DOWN.

trap was left at this nest where I found the eggs were being covered after the female was caught, and the male was taken in one on June 21. The eggs were nearly ready to hatch and were not saved. Another nest found on June 20 contained a single egg. This nest, freshly made, was apparently abandoned after my visit, possibly owing to my disturbance of the sedge near it so soon after the laying of eggs began. Another freshly made nest, of one of these rails, appeared to be ready for the reception of eggs, but was also apparently abandoned when I found it. I succeeded in flushing one bird which rose out of the sedge with cries of alarm, but flew only a few feet and with legs dangling conspicuously dropped into the sedge again at a point too near to enable me to shoot without destroying it as a specimen. All of the nests were of sedge leaves massed in tufts of green sedge about six inches above the surface of shallow water. The species may be said to have been common in June. Returning to the locality on

July 19, we missed the notes which were nearly continuously heard during the evenings and until late at night at the time of our visit the previous month; a few notes only were heard and we assumed that the breeding season was entirely past.

Fulica americana americana. Coot. Probably 250 of these birds were living in the marsh at the beginning of our first visit. Some were affected with a fatal disease. I saw at least twenty-five dead birds and there were doubtless many others in the marsh. Some of these had been dead for a number of days, but others were fresh. Early on the morning of June 20 two which had apparently died during the night were found about twenty feet apart. A small quantity of bloody mucus lay beside each bird. No signs of sickness were noted among the living birds. But few nests were found, considering the number of birds present. A nest found on June 15 contained seven partly incubated eggs. The nest was a platform of sedge fixed to sedge stems but floating in water about one foot deep. I found two other nests, both made of tule stems and floating in rather shallow water among standing tules. Some young, recently hatched and apparently all of the same family, were seen by Jackson on June 25. At the time of our second visit, July 19 to 21, a number of coots, including a few young, were observed. In tramping through the marsh we came upon no fresh dead birds, and it appeared that an epizootic, which caused the deaths noted the previous month, had run its course.

Steganopus tricolor. Wilson Phalarope. Three only were seen swimming close together in the open water of the lake on June 25. One female secured as a specimen had very slightly enlarged ovaries.

Numenius americanus americanus. Long-billed Curlew. A Long-billed Curlew was seen on a mud flat near the lake by Jackson on June 25. The bird was very wild, but was distinctly observed. Upon being approached the bird flew from the marsh to the arid hills, where it was followed but could not be secured.

Oxyechus vociferus vociferus. Killdeer. Probably a dozen pairs of this noisy bird were noted around the lake. No nests were found, but at least seven pairs were suspected of having nests with eggs.

Xanthocephalus xanthocephalus. Yellow-headed Blackbird. Perhaps fifty pairs were nesting, mainly in the small patches of tules in the marsh, but some nests also in large sedges. One of the latter category was fastened to sedge stems at a point about a foot above the surface of water a foot deep. The nest was of sedge leaves lined with the finer shreds. The eggs, taken on June 20, were partly incubated. Another nest of sedge leaves fastened a foot above the surface of the water among tules contained young birds on the same date. The antics of the males as they sat about on the tules or rose in the air with feathers ruffled and bills pointing upward, together with their gurgling notes, reminded me of the behavior of some of the troupials of the Tropics. When we revisited the lake in July, the adults, perched or flying about in the tules, were much more in evidence, and the odd notes of the young could be heard. The males had ceased their troupial-like antics and were much more dignified in behavior.

Agelaius phoeniceus neutralis. San Diego Red-wing. About twenty-five pairs of these red-wings were breeding at the lake. The nests were of sedge leaves fastened among sedge stems in the marsh, usually a foot or more over the surface of the shallow water. A set of four fresh eggs was taken on June 13.

Euphagus cyanocephalus. Brewer Blackbird. About fifteen pairs were nesting, mainly in clumps of willows in the vicinity of the lake. A nest in the chimney of an old house contained hatching young on June 25.

Washington, D. C., December 16, 1925.