

SOME OBSERVATIONS ON THE LIFE-HISTORY OF
THE RED-BREASTED MERGANSER,
MERGUS SERRATOR, LINN.

BY R. M. STRONG.

DURING the summer of 1911, it was the writer's good fortune to be in a locality where Red-breasted Mergansers were breeding in some numbers. Headquarters were established at Ephraim, Door County, Wisconsin; and islands in Green Bay were explored a number of times. Spider Island and Gravel Island, across the peninsula in Lake Michigan, were also visited with the aid of information kindly furnished by Mr. Henry L. Ward of the Milwaukee Public Museum. All of the wooded islands in this region not occupied by man, were found to have nests of the Red-breasted Merganser. On examination of the literature, later, only fragmentary accounts of the life-history of this bird could be found. As these are also much scattered, it has seemed desirable to collect such material as is available with the observations made by the writer into the following article.

The Red-breasted Merganser is generally described as having a wide distribution in the northern part of the northern hemisphere from Alaska eastward even to Japan and China. It breeds in the northern portions of its range. According to Ridgway¹ there are breeding records as far south as northern Illinois.

All of the nests which were found by the writer were on the ground in scrubby growths or among forest underbrush on islands. Mergansers were seen near the shore of the mainland, under circumstances which suggested strongly that they were breeding there also, but no nests were found on the mainland. The general characteristics of the nests and of their locations corresponded to the descriptions given by the authors of various works on birds.

Nest No. 1 was found June 20 at the base of the bush which appears in Plate XXI, fig. 1. It contained only five eggs at this time, and it consisted as usual of a mass of sticks and debris lined

¹ Ridgway, R. Manual of North American Birds. Also in The Ornithology of Illinois, Vol. II. Part 1, p. 189-190.



1. SITE OF RED-BREASTED MERGANSER'S NEST.



2. NEST AND EGGS OF RED-BREASTED MERGANSER.

with a light gray down which also partially covered the eggs. The down occurred in the usual abundance for nests of this species and presented a comfortable appearance.

Another nest which was found nearby was placed in the midst of a patch of nettles (*Urtica gracilis*) and bushes. Other nests were found in various positions of concealment. One was among nettles alongside a large drift-log. The nest shown in Plate XXI, fig. 2 was at the base of a bush in a position similar to that occupied by nest No. 1, but with a drift log at one side. Still another nest was among some roots of a tree on the side of a bank in a little cave which had been formed by erosion of the soil about the base of the tree. Usually the nests were within seventy-five feet of the water, but one was found over one hundred feet away from water, and some fifty feet or more back in dense woods and underbrush. This nest was well concealed by ground conifers, and the brooding female was flushed at my feet. Except when the bird was flushed suddenly from her nest, the eggs were usually found covered more or less completely with down. Dall¹ states that six nests which were found on an island in the Yukon River, Alaska, near its mouth, were all carefully concealed under dry leaves. He found most of the nests in small hollows under logs of drift wood. It is stated by Meyer² that the nest may be placed in a recess many feet deep in a hollow tree. Mr. H. L. Ward, in conversation, told the writer of a nest observed by him in a barrel. Meyer claims that the nest may also be in the top of a tall tree.

Yarrel³ mentions locations under projecting rocks or in thick brushwood. He describes the nest as being composed of moss and lined with down from the bird, and he notes a similarity of the nest both in structure and in materials to that of the Eider Duck. This resemblance was also noticed by Audubon,⁴ but he says that the nest of the Red-breasted Merganser is better-fashioned and considerably smaller. He described the construction as consisting of dry weeds and mosses of various kinds "warmly lined with down from the breast of the female bird."

¹ Baird, Brewer, and Ridgway. *The Water Birds of North America.* Vol. 2, pp. 116-120. Quotes Dall.

² Meyer, H. L. *British Birds.* 1842. Vol. 6, pp. 179-183.

³ Yarrell, W. *A History of British Birds.* 1856. Vol. 3, pp. 392-397.

⁴ Audubon, J. J. *Ornithological Biography.* Vol. V, pp. 92-99.

This species was found by Audubon and also by Dawson and Bowles¹ to prefer the vicinity of fresh water for its nesting place.

The number of eggs in a set is stated somewhat differently by various writers. Thus Audubon found frequently six to eight eggs but never more than ten in a nest. Wilson and Bonaparte² mention eight to thirteen eggs. A female with eleven young was seen by Osgood³ in Alaska. The writer's notes include the following records of the number of eggs in nests where there was evidence that the sets were complete:

One nest contained seven eggs.

Four contained nine eggs.

Two contained ten eggs.

According to a number of authors, the female alone incubates the eggs and rears the young. The writer's limited observations, support this view. No males were observed by the writer about the nests, but they were seen in small flocks in the immediate vicinity, and they sometimes flew near. It was not possible to learn whether they were interested in the nests or not. Maynard⁴ states that males were not seen during the brooding period, but "later when the downy young were swimming in the neighboring ponds both parents birds were present and exhibited considerable solicitude, flying distractedly about, often swimming within a few yards of me."

Though the writer spent several days in the vicinity of a number of nests after the eggs were due to hatch, the young were never seen at close range away from the nest except in one case when only the female was in view. Two nests were found with young just hatched and with eggs hatching. These will be discussed later in this article. Broken shells were found but the young mergansers were usually not to be seen, and they were presumably hidden in the underbrush.

If the brooding female had not already left the nest before the

¹ Dawson, W. S. and Bowles, J. H. *The Birds of Washington.* Vol. II, pp. 760-762.

² Wilson, A. and Bonaparte, C. L. *American Ornithology or the Natural History of the Birds of The United States.* 1877.

³ Osgood, W. H. *A Biological Reconnaissance of the Base of the Alaska Peninsula.* *North American Fauna.* No. 24, p. 55.

⁴ Maynard, C. J. *The Birds of Eastern North America.* pp. 461-462. 1881.

writer landed at the islands where the nests occurred, she flew some distance on being flushed, usually alighting on the water. On several occasions while studying gulls in my tent which had been pitched within a few rods of a merganser nest, the female parent came unconcernedly near. One bird splashed in the water at the shore about one-hundred feet away as though in play or taking a bath. Another waddled by the tent shortly after it was pitched, uttering duck-like quacks as she returned to her nest. On the whole the mergansers seemed to be shy.

In order to study the young more closely than would be possible in the field, some merganser eggs were hatched under a hen. Six eggs were collected on June 26. To keep them warm until they could be placed under a hen, they were carried in a shoe box with three nestling gulls which were also collected on this trip. Three were taken from nest No. 1 which contained only five eggs on the 20th. This nest held nine on the 26th. The other three eggs were obtained from a nest which contained nine eggs both on June 20 and on the 26. This nest will be referred to as No. 2.

The six eggs were placed under a broody hen which was fortunately available at the time on the premises where the writer was boarding. On the morning of July 11, one egg from nest No. 2 was found hatched, and another bird appeared before noon. The third egg did not develop. The writer visited the nest from which these eggs were taken, the next day, July 12, when most of the eggs were found hatched. Apparently the eggs under the hen had made as good progress as those left in the nest with the parent merganser. Two of the eggs from nest No. 1 hatched on July 25, having been under the hen a few hours less than twenty-nine days. This indicates a probable incubation period of about four weeks for the Red-breasted Merganser. Evans¹ in his incubation-period tables quotes Tiedemann as giving 26 to 28 days as the incubation time for this species. (Tiedemann's work has not been accessible to the writer.)

The baby mergansers had the usual attractiveness of newly-hatched precocial birds. The downy young of the Red-breasted

¹ Evans, W. On the Periods occupied by Birds in Incubation. *Ibis*. 1891, Vol. III, Ser. 6, pp. 52-93.

Merganser have been described by Ridgway¹ as follows: "Above, hair-brown, the posterior border of each wing, and a large spot on each side of the rump, yellowish white; lower parts including the malar region, yellowish white; side of head and neck reddish cinnamon, paler on the lores, which are bordered above by a dusky stripe running backward to the anterior angle of the eye, and below by a dark brown, rather indistinct rictal stripe; lower eyelid white." In place of the term reddish cinnamon we may substitute dull or broken shades of orange-yellow which pass over into light tints of this color. The bill and feet are mostly varying shades and tints of olive or a very much "broken" yellow.

During the first few days and especially on the first day, the down feathers are more or less bristly as their barbs are held together very frequently by feather-germ material. The soft fluffiness which is characteristic of a newly-hatched chick does not appear very fully until a few days later. Nestlings hatched by the parent itself in the field showed the same bristly appearance.

Within a few hours after hatching, the young mergansers became quite active, and the two hatched on July 11, were seen in the late afternoon of that day sitting on top of the hen's back, a location they seemed to attain with little trouble. Cory² observed a female merganser bearing a weak nestling on her back and wrote "He scrambled upon her back and nestled snugly down behind her neck. . . . away she went. . . . followed by her brood."

On the next day, the little birds were still more active, and they began to jump towards the upper edge of the box in which the nest was placed. They were also able to move rapidly over the ground, though apparently not yet able to stand on their feet. Locomotion was accomplished by a peculiar wriggling movement of the whole body prostrate on the ground. These movements always suggested those of a snake. When nest No. 2 was visited on July 12, the little mergansers, though apparently not more than a day old and perhaps younger, were very wild; and they were caught with difficulty in the tangle of weeds and brush about their nest. One of these birds was captured and taken home to the hen with her two charges. This third bird appears in the figure which shows

¹ Ridgway, R. The Ornithology of Illinois.

² Cory, C. B. A Naturalist in the Magdalen Islands. p. 72.

three downy mergansers. The female parent merganser remained on the nest until the writer was within a few feet, before leaving her family. The nestlings seen in this nest and in another exhibited the type of locomotion just described.

A nest which was found on July 15 contained seven young just hatched and one egg. A companion found the nest and took the writer to it. On our approach, the nestlings began to scatter. All but one were caught and replaced in the nest. During the time which was occupied in making several photographs, the young were kept in the nest by a hat which was placed over them. This was removed an instant for each picture. After a few plates had been exposed, the seventh nestling was observed, more than twelve feet away, approaching through a tangle of nettles and other weeds. We stood as still as possible while the little bird came by the most direct route possible towards the nest until it happened to climb on one of the writers's feet where it was captured to be returned to the nest. Presumably these nestlings had never before left the nest. It would be interesting to know how this bird was able to find its way back and why it returned with two men in plain view from whom it had fled in terror a few minutes before. Its nest-mates were not making any noise that the writer could notice.

The three mergansers were removed with the hen to a pen with ample space for exercise, and the other three eggs were placed under another hen. One of these eggs was broken and the other two hatched, as has been said, on July 25. Though apparently strong, one of the young died on the next day and the other a day later.

The problem of what to feed the little mergansers was perplexing. One caught at the nest (No. 2) on July 12, had no food in its stomach, so nothing was gained by this effort to find what the parents were feeding their young. It is commonly stated that the mergansers are fish-eating birds. According to Morris,¹ the Red-breasted Merganser eats small fish, beetles, water insects and their larvæ, worms, and frogs. Meyer² mentions small fish, water beetles, insect-larvæ, worms, and sometimes frogs. It is stated by Jones³ that the young "When first hatched live upon small

¹ Morris, F. O. *A History of British Birds.* Vol. 5, pp. 239-242.

² Meyer, H. L. *British Birds.*

³ Jones, T. R. *Cassell's Book of Birds.* Vol. III, pp. 173-174.



1. RED-BREASTED MERGANSERS, TWO DAYS OLD.



2. RED-BREASTED MERGANSER, THREE WEEKS OLD SWALLOWING
A GRASSHOPPER.

crustacea and larvæ, caught upon the surface of the water, but on the third day are able to dive, and from the eighth day are quite capable of fishing for themselves." Robinson¹ found a "small round crab" in the stomach of a male Red-breasted Merganser which was dissected, and more crabs of the same size were seen in the gizzard. All that the writer knew about the food of mergansers when these birds were hatched, was that they eat fish.

As it was not practicable to depend upon fish for feeding the little mergansers, bits of boiled egg and liver were forced into the mouths of the unappreciative and wriggling babies. These attempts met with very little success, and the prospects of rearing any of the birds were not bright. It happened that grasshoppers were exceedingly abundant at the time, and these were tried with success, though one of the birds died on the 13th and another on the 14th. The third began to take the grasshoppers willingly, especially when they were offered by the hen. Two days later, this bird ate eight grasshoppers which averaged over an inch in length, at a single meal. As the writer was away in the field a good deal, the feeding was done irregularly but was attended to at least three or four times a day.

The grasshoppers were often taken directly by the little merganser the moment they dropped to the ground in the pen from the writer's hands, especially when the victim moved. If it remained quiet, it was often overlooked. When the bird was about a week old it would dart after an escaping grasshopper with great speed and skill.

The operation of swallowing a grasshopper usually involved many manipulations. (See Plate XXIII, fig. 2.) Rapid movements of the mandibles and of the whole head for that matter, were involved, and it seemed to be often quite an undertaking. Even when the head-end was taken first, projecting wings or legs caused a lot of trouble. On July 25, thirty grasshoppers of the size mentioned were eaten by this bird.

The hen was given food for her own consumption in the form of grain, and table scraps. These were offered to the merganser persistently by the hen but they were not accepted at first. During

¹ Robinson, H. W. *British Birds.* Vol. II, p. 31.

the third week, some of these table scraps were observed to be eaten by the merganser, especially bits of cooked fish. Cooked fish proved to be the most satisfactory food as it could be kept in an ice box for several days without spoiling and the merganser seemed to thrive on it.

Audubon¹ states that the young of the Red-breasted Merganser go to the water a few hours after hatching and are expert at diving from the first. This is to be expected, of course, as ducklings take to the water at once, though ducks are no more aquatic in their habits than mergansers, and are excelled in diving ability by the latter. The following is taken from Chamberlain's² description: "Soon after they are hatched, the young are led to the water, and at an early age they swim rapidly and dive with great expertness, as I have learned by experience."

Clear spring water was kept for the hen and mergansers in a rectangular pan about two to three inches deep. The little birds were never observed to swim. The three mergansers which appear in the illustrations were all placed in the water, but they jumped out as though frightened. The single bird which lived more than a few days was seen in the pan only twice during the first nine days. On one occasion, it seemed to be enjoying the water though not swimming. On the tenth day the writer's notes contained the following: "Saw merganser in water today when it thrust its bill under water a couple of times. It left the water within a minute after my arrival but I could not tell whether it would have remained in longer if I had not been present." It is a curious fact that the mergansers which died were found lying in the water pan.

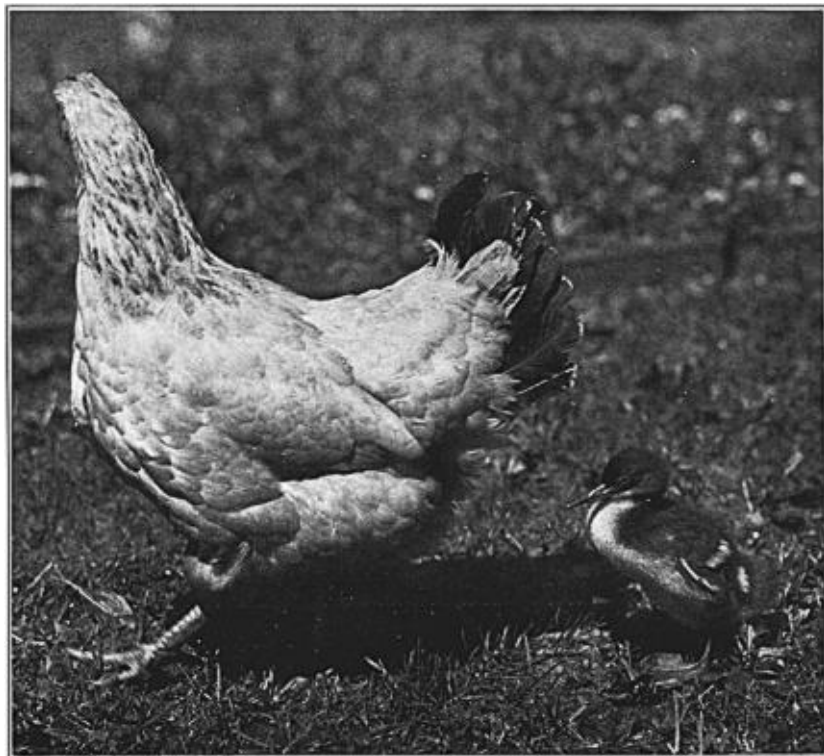
The surviving merganser was often seen on the hen's back, and it appeared fully as devoted to her as a chick could be. When separated, the little bird would appear much disturbed, and peeps somewhat resembling those made by a duckling under similar circumstances were made. This devotion is suggested in Plate XXII, fig. 2. On the other hand, one of the nestlings escaped from the box where it was hatched, on the second day. It went

¹ Audubon, J. J. Ornithological Biography.

² Chamberlain, M. A Popular Handbook of Birds. The Ornithology of the United States. Based on Nuttall's Manual. Vol. 2, pp. 360-362.



1. CHARACTERISTIC BREEDING HABITAT OF RED-BREASTED MERGANSER.



2. RED-BREASTED MERGANSER, FOUR WEEKS OLD, WITH FOSTER MOTHER.

through a barn door and out into the yard where it was found by the writer, about ten rods away lying peacefully on the ground among some chickens.

On August 3, the merganser and hen were placed in a box and taken to Chicago where they arrived safely after a journey of about thirty hours. They were kept in a backyard in Chicago for about ten days. During this time, the view shown in Plate XXII, fig. 2, was taken. The bird was then fat and apparently healthy. When about one month old it was taken to the Lincoln Park Zoological Gardens. The keeper noticed the hen stepping on the merganser and separated them. A day or so later the young bird died and thus ended the hope that a zoological garden might have a live merganser.

As is the case with young ducks, there appears to be little change in the plumage during the first month. In Plate XXII, fig. 2, the merganser is seen to be still in the down plumage. The tail is provided with a set of bristly feathers which have a shaft or rhachis and are in evidence even at hatching.

According to Dawson and Bowles¹ the young birds are nearly full grown before they can fly, but they can flutter over the water very effectively, almost walking on it.

Besides being an expert diver, the Red-breasted Merganser is described by Morris,² Samuels,³ and Dawson and Bowles as sometimes swimming with the body submerged as the grebes do with bill and upper part of the body only above water.

Various writers including Dunn,⁴ Morris,⁵ and Gould⁶ state that the male Red-breasted Merganser undergoes a molt after the female begins incubation. This molt has been described by Stone⁷ for a specimen which was collected in July. The occurrence of a molt at this time would seem to support the view mentioned in this article that the male deserts the female after the eggs are laid and takes no part in the care of the eggs or young.

¹ Dawson and Bowles. *The Birds of Washington.* Vol. II.

² Morris, F. O. *A History of British Birds.*

³ Samuels, E. A. *Our Northern and Eastern Birds.* 1883. p. 526.

⁴ Quoted in Yarrell's "*A History of British Birds.*"

⁵ Morris, F. O. *A History of British Birds.*

⁶ Gould, J. *The Birds of Great Britain.* Vol. V.

⁷ Stone, W. *The Summer Molting Plumage of Certain Ducks.* *Proc. Acad. Nat. Sc. Philadelphia.* 1899. pp. 471-472.

Audubon¹ states that the males are not fully developed until the second year.

The voice of the adult bird is described by Morris² as consisting of a note "*curr, curr.*" The following is taken from Nelson's³ account "The old bird marshalled her brood to the farther side of the pond as I drew near, uttering frequently a low, distinct, but husky, *kha-kha.*" The writer has already noted on p. 4 of this article a resemblance in the voice to that of the domestic duck.

A pair of adult Red-breasted Mergansers with five downy young are figured, natural-size, in one large colored plate by Gould.⁴ The colors are fair, but the positions and the grouping are artificial.

The Red-breasted Merganser usually appears in the region of Chicago in March or early April, though it is reported as sometimes spending the winter in the vicinity. Flocks occur in the lagoons of Jackson Park until early May, and individuals sometimes linger through a large portion of May. It seems probable that nesting does not begin until early June.

¹ Audubon, J. J. Ornithological Biography.

² Morris, F. O. A History of British Birds.

³ Nelson, E. W. Report upon Natural History Collections Made in Alaska between the Years 1877 and 1881. No. III. Arctic Series. U. S. Army Signal Service. p. 67.

⁴ Gould, J. The Birds of Great Britain. Vol. V.