

THE SNAKES OF THE LAKE MAXINKUCKEE REGION.*

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The total number of species of snakes known from the vicinity of Lake Maxinkuckee is ten. This number is not large; doubtless more thorough field work would increase the number slightly. While the species are not numerous, several of them are fairly abundant in individuals. This is particularly true of the common garter snake and the water snake. The former of these may be seen in suitable situations on almost any warm day from early spring until late in the fall, while the latter is almost equally frequent from the middle of summer to early fall about the borders of Lost Lake and along the Outlet.

Nearly all, perhaps all, of the species bear some relation to the life of the lake, some of them feeding on fishes when opportunity offers, and all feeding upon frogs. Only one of the species of snakes known from the Lake Maxinkuckee region is poisonous; that is the little prairie rattlesnake which, fortunately, is not abundant.

SPECIES OF SNAKES.

1. *Storeria dekayi* (Holbrook).

DE KAY'S SNAKE.

This pretty little snake occurs sparingly throughout the eastern United States and westward to Colorado and Wyoming. At Lake Maxinkuckee it is one of the rarest species. Our collection from about the lake contains only three examples, viz., one, No. 33529, U. S. National Museum, obtained October 8, 1900, and two others taken on October 17, 1907, one near the Outlet, the other on the east side of the lake.

This species is known also as Brown Snake and Ground Snake, the former because of the color, the latter because it is so frequently found burrowed in the ground.

It is not only a harmless little snake, but it is useful, its diet con-

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sisting chiefly of crickets, grasshoppers, and other noxious insects. It is also fond of earthworms and slugs.

It reaches a length of only a foot or less. Its color is a grayish brown, with a lighter band or line along the back, on each side of which is a dotted line; there is also a dark patch on each side of the occiput, and the under parts are grayish. Scales in 17 rows; ventral plates 120-138.

2. *Thamnophis proxima* (Say).

RIBBON SNAKE.

This species is found from Wisconsin to Mexico. At Maxinkuckee it is one of the rarer snakes. The only example (No. 02779, or 33545, U. S. Nat. Mus.) in our collection was secured September 21, 1900, near Lost Lake, southwest of Mr. Green's house. Another was seen nine days later south of the lake.

It is a very slender, graceful snake. It is probably not rare in the weedy patches west of Culver, particularly about old, drained lake-beds where the ground is still wet and where there are occasional pools. In the spring of 1901, four were seen, two on April 9 at the drained lake west of Culver, one April 30 at Culver Creek, and one May 20 in Hawk's marsh.

In habits this species does not differ greatly from other garter snakes. It delights in marshy situations and is not averse to an occasional short stay in the water. Its food consists chiefly of small frogs, toads and insects, with an occasional small fish.

This snake may be known by the following characters:

Lateral stripe on third and fourth rows of scales; scales in 19 rows, little or not at all spotted: color chocolate brown, with three yellow stripes; light brown below lateral stripes; ventral plates 150 to 160; tail about one-third the total length which rarely exceeds thirty-six inches.

3. *Thamnophis sirtalis* (Linnaeus).

COMMON GARTER SNAKE.

This is one of the most variable as well as one of the most widely distributed of all snakes. It or its subspecies may be found in nearly all parts of the United States, and it is by far the most abundant snake about Lake Maxinkuckee; it is probably more numerous than all other species combined.

It may be found in all sorts of situations: in cultivated fields and

gardens, about yards and barn lots, in grassy meadows and in open woodland, in marshy ground along streams and about lakes, and particularly along paths and public highways. It perhaps most delights in reedy, boggy places and lake margins. It is the first snake to be abroad in the spring and one of the last to go into hibernation in the fall. The first warm days of spring will rouse them from their winter's sleep and bring them forth to bask in the sun. Then they may be found usually lying at full length on a mass of dead grass along a fence-row or in some such situation, well exposed so as to get the full effect of the sun's warmest rays. Here they will lie quietly through the middle of the day soaking out the accumulated chill of the long winter. Thus they will pass several days before they begin to move about or to seek food.

In the fall they appear to be active to the last, continuing to eat until they go into winter quarters. At this season they seem to move about more than usual, perhaps because searching for suitable hybernacula. It is at this season that one so frequently observes their tracks across the dusty highway and when so many are run over and crushed on the public roads and by railroad trains.

Numerous examples were noted about the lake and in the surrounding country, and many specimens were collected. Examples were noted in April, July, August, September, October and November, the earliest date being April 9 and the latest November 22.

A female 3 feet long was killed July 26 and 40 young, each 6 to 7 inches long, were taken from her body. This and all other species of the garter snakes are viviparous, bringing forth their young alive. Dr. J. Schenck, of Mt. Carmel, Ill., reports that 78 young, 3 to 7 inches long, were taken from a female 35 inches long.

The garter snake has quite a varied menu. They are known to feed upon insects, insect larvæ, small rodents, young birds and bird eggs, toads, frogs, angleworms, small mollusks, tadpoles, salamanders, and small fish. Frogs, toads, fish, shrews and field mice doubtless constitute the major portion of their diet. One found dead on the railroad tracks near the elevator in the late autumn of 1906 was examined. It was quite fat, as snakes are likely to be at that time of year. The stomach was empty of food, but contained a few ascaris-like parasites.

One the whole, however, this snake is beneficial to the farm and should be protected. The disposition which most people have to kill every snake on sight is entirely irrational and wholly unjustifiable.

This creature, like many other snakes, is protected by an abominably sickening odor, not noticeable at a distance, but as disagreeable a smell as one is apt to encounter. This odor, however, is noticeable only when the snake has been annoyed and has become angered. When angry it sometimes flattens out after the fashion of the blowing adder.

There is a great variation among the individuals of this species found about the lake, and two or more subspecies should probably be recognized. We, however, have grouped them all under the species.

From all other snakes found about the lake, particularly the ribbon snake which it most resembles, this species may be readily known by its having the lateral stripe on the second and third instead of the third and fourth rows of scales. This species is also stouter, the tail being one-fourth the entire length. Color olivaceous, dorsal stripe narrow, obscure; three series of small dark spots on each side, about 70 between head and vent; side and belly greenish; lateral stripe rather broad, but not conspicuous; colors generally duller than in other species; ventral plates 130 to 160. Length 2 to 4 feet.

4. *Thamnophis butleri* Cope.

BUTLER'S GARTER SNAKE.

This is the rarest of the species of garter snakes which occur at the lake. The only example we have seen was found freshly killed just south of the Indiana boathouse on the east side of the lake July 23, 1900. It is No. 33544 (02716), National Museum.

It may be known from other garter snakes of the region by the location of the side stripes which are on the second, third and fourth rows of scales, which is not the case with either of the other species.

5. *Natrix sipedon* (Linnaeus).

WATER-SNAKE.

The water-snake is a common and well-known snake throughout the whole eastern United States as far westward as Kansas, and is tolerably abundant throughout its range in wet places, such as streams, ponds and lakes. About Lake Maxinkuckee it is to be found along low bits of shore such as that about Norris Inlet and the various other inlets of the lake, and near the Outlet. One of its favorite haunts is that portion of the Outlet between the two lakes. Next to the common garter snake this water snake or "moccasin" is the snake most frequently seen about the lake.

We have records of numerous examples seen, the earliest date being May 3 and the latest August 29. It is probably most abundant in June. Definite dates are as follows: In 1899, one seen July 11 and another August 29. In 1900, one seen July 13, 17 and 20, all on the west side; one seen on east side of Lost Lake August 1, one at Fish Commission Station August 7, and one near the Inlet August 16. In 1901, one in Culver Bay May 3; a large one on west side May 6, one near Farrar's May 23; a large one on Long Point June 2; another on Long Point June 16; one at Outlet June 19; one 3 feet 9 inches long on west side June 22; and a small one on Long Point June 24. In 1906 a large one found dead on Long Point August 15, a small one in Green's marsh, one at the Outlet and one on Yellow River August 16. During the summer of 1906, after the dam was thrown across the Outlet at the railroad bridge the water in the Outlet below the dam became very low, and water snakes could be found along the edge of the water almost any time a visit was made to that place.

This is the species more often seen in the water than any other. It delights to lie coiled on some old log or root in or at the edge of the stream, or on the timbers at the dam or the logs of drift material. It inhabits rather open woodland ponds in great abundance, and in such places they often collect several together on projecting logs. In such situations it lies in wait, basking in the sun, making short excursions now and then into the water after fish or frog, or dropping quietly into the stream when disturbed by the near approach of any one. Then it hides under the bank, only its head being out of the water, or else swims swiftly away and out of reach. While swimming it usually keeps its head above water, but when closely pressed or annoyed it will go entirely under and swim along on or near the bottom.

The water-snake is frequently called "moccasin" or "redbelly" and is by many believed to be deadly poisonous. Its bite is, however, entirely harmless, and it is very different from the venomous "water-moccasin" or cotton-mouth of the south.

Although the water-snake is non-venomous, it has very little to commend it. It is repulsive in appearance and spiteful in temper. It is more destructive to fishes than any other of our snakes; indeed, it seems to subsist chiefly on fish. It will eat any kind of fish it can catch, though it doubtless prefers the soft-rayed species, such as the minnows, suckers and the like; it surely finds them easier to handle than the spiny-rayed species such as the bass and perch. We have found many different fishes

in the stomach of the water-snake; among them we may mention suckers of various species, various minnows, bass, rock-bass, sunfish, eel, carp and catfish. One large water-snake was found that had attempted to swallow a large catfish but the catfish straightened out and set its pectoral spines, and the snake, being unable to get the fish either up or down, perished, a victim of his own greed.

Besides fish the water-snake feeds also on frogs, crawfish and young birds.

The water-snakes mate early in spring, soon after coming out of their winter quarters, and then sometimes congregate in numbers of four or five together. The species is viviparous. In August, 1899, an old snake was found on the railroad track near the ice-houses. It had been run over by a train and ten young, which it contained, were prematurely liberated.

The water-snake probably comes out and basks on bright days in autumn after it has ceased taking food. One found dead near Farrar's in the autumn of 1906, October 20, was cut open and the stomach found to be empty, except for some ascarid-like parasites. The mesenteries were well loaded with a supply of fat, probably for the subsistence of the snake during its winter hibernation. It contained 30 ova, 15 on each side.

Color, brownish: back and sides each with a series of large, square, dark blotches alternating with each other, about 80 in each series; belly with brown blotches; rows of scales 23; ventral plates 130 to 150. Length 2 to 4 feet.

6. *Collopettis vulpinus* (Baird & Girard).

FOX SNAKE.

This large and beautiful snake ranges from New England westward to Kansas and northward. It does not appear to be common about Lake Maxinkuckee, as our notes record but eight examples, as follows: A fine example on the west shore of Lost Lake early in July, 1900, and another large one near the same place July 8; one seen near Lost Lake, September 3, and a large one gotten on Long Point September 25; one in Walley's woods August 25; another on Long Point September 25; one about 6 feet long August 14, 1906, west of Culver near the beaver-dam prairie on the road to Bass Lake; and a large one near the Gravel Pit early in June, 1907. Individuals seem most frequent in late summer or early fall.

The fox snake, often called the pine snake, frequents the dry, open woods and the neighborhood of briar patches and copses. We have never

observed it in the water or on the immediate lake shore. It is often called the pilot snake and is supposed to have some mysterious connection with the rattlesnake. Though entirely harmless, it is one of the most viciously disposed snakes. When provoked, as Dr. Hay observes, it shows its irritation by vibrating the tip of its slender tail, which, when striking a crumpled leaf or any other small object, may produce a rattling noise very much like that made by a rattlesnake under similar circumstances. A large example caught near Bass Lake August 14, bit Professor Wilson on the hand, causing blood to flow freely but producing no serious effect.

While entirely harmless, its habits are not unlike those of the black-snake and it doubtless destroys many eggs and young of ground-nesting birds. Besides these, its food consists of mice and other small rodents, the larger insects and their larvæ. It probably feeds to some extent on frogs and toads, but we have no evidence that it ever catches fish.

This is a large, light brown snake, with squarish, chocolate-colored blotches about 60 in number; scales in 25 rows; ventral plates 200 to 210; vertical plate broader than long.

7. *Bascanion constrictor flaviventris* (Linnaeus).

BLUE RACER.

This common and familiar reptile, also known as the black snake or black racer, is found pretty generally distributed throughout the eastern United States and southward. It frequents open woodland, old fence rows and all places where dead leaves are common. It is the largest of the snakes of this region. It is an active, vigorous snake, moving over the ground with great rapidity. It is not a coward, as are most snakes, but will, on occasion, attack a person when disturbed, coming toward one rapidly and with head raised one or two feet. Cope says "the constricting power of the black snake is not sufficient to cause inconvenience to a man, but might seriously oppress a child. The pressure exercised by a strong individual wound round the arm is sufficient to compress and close the superficial veins, and cause the muscles to ache, but it is easy to unwind the snake with the free hand and arm." The black snake is harmless, and its bite, which it rarely inflicts, only amounts to a serious scratch.

The black snake is, in some respects, a useful species. Its food consists chiefly of field mice, white-footed mice, and other noxious animals. It also feeds upon frogs, toads, birds' eggs and young birds, and probably does more harm than good. The greatest objection to it is its disposi-

tion to rob birds' nests of their eggs and young. Ground-nesting birds are particularly apt to suffer from the depredations of the black snake; and those species such as the song sparrow, catbird, thrasher, robin, dove and redwing, which place their nests not far above the ground, and the bluebird, chickadee, and downy woodpecker, which deposit their eggs in holes in trees or snags not many feet up, are often despoiled of their eggs or young by this snake.

We have often seen black snakes coiled up on limbs of trees or crawling about among limbs several feet above the ground evidently searching for birds' nests. One of us remembers seeing a bluebird greatly disturbed by a large black snake which was apparently about to climb to the bluebird's nest which was in a hole only 3 or 4 feet up in an old elm snag. Coiled up at the foot of the snag, its head elevated perhaps a foot or 18 inches, the snake watched the bird intently, its head moving this way and that and following closely the movements of the bird which fluttered incessantly about the snake and was probably as completely "charmed" or under the power of the snake as birds ever get. When approached the snake became frightened and crawled away among the bushes; and then the bird flew to a limb near by.

A friend who is a close observer of animals tells us that he once saw a ruffed grouse fighting a black snake which was endeavoring to rob the grouse's nest. He shot the snake, and the grouse, after showing some astonishment, feigned lameness to lead him away from the nest.

Another friend says that he once saw a chipmunk "charmed" by a large black snake. The chipmunk was on a log about 12 feet long, the snake at one side near the middle of the log and with head elevated somewhat more than the height of the top of the log. The chipmunk when first seen was uttering the well-known chirping note so expressive of solicitude and running back and forth on the log, at first the full length of the log, then less and less until it ran but a few inches each way from the snake whose head all the time moved to the right and to the left, following closely the movements of the little rodent. At the same time the snake's tail, elevated and rigid, was rapidly vibrating and making a noise not unlike that made by a rattlesnake. Unfortunately the observer shot the snake without waiting to learn if the chipmunk were really in any manner under the control of the reptile.

The black snake is not rare about Lake Maxinkuckee. Our notes record seven or eight individuals seen at different times. The earliest rec-

ord is the last week in May and the latest October 14. A large example seen east of Lost Lake on the latter date was quite stupid and declined to move. A 4-foot individual seen in Walley's woods was evidently blind, due to shedding its skin which was so loose that it slipped off when the snake was handled. The eyes were white, and the snake instead of seeing, apparently listened. Another was seen in Walley's woods September 21, 1900. On August 13, 1906, a very large one was seen half-concealed in the briars near the ice-houses. When approached it made its tail rattle among the dry leaves precisely like a rattlesnake. On August 14, 1906, a large one was caught near Bass Lake. Another, 5 to 6 feet long, was seen in Walley's cornfield September 20, 1907. It was coiled loosely at the base of a corn-stalk and seemed disinclined to move, though it stuck out its tongue repeatedly.

This snake is usually lustrous blue-black or pitch-black above and greenish below; chin and throat white. Young olive, with rhomboid black blotches. Body very slender; eye large, scales in 17 or 19 rows; ventral plates 170 to 190. Length 4 to 5 feet.

8. *Lampropeltis doliiatus* (Linnaeus).

HOUSE SNAKE.

This is the common house snake or milk snake so abundant in most of the upper Mississippi Valley States. It does not appear to be very common, however, about Maxiukuckee. The only example seen by us was obtained July 28, 1899, at our station near the Arlington Hotel. It is one of the mildest and most useful of snakes and feeds largely upon the various species of small noxious mammals. Its habits, however, are not entirely beneficial, as it will, on occasion, eat such hens' eggs and birds' eggs as it may find.

We have never seen it swimming in the water and do not know whether it ever feeds on fishes or other aquatic animals.

Color, grayish, with 3 series of brown, rounded blotches bordered with black, about 50 in the dorsal row; an arrow-shaped occipital spot; belly yellowish-white, with square black blotches; dorsal scales in 21 rows. In the young the dorsal blotches are bright chestnut-red inside of the black margins, and the spaces between are sometimes white or clear ash.

9. *Heterodon platyrhinus* Latreille.

HOG-NOSED SNAKE.

This interesting reptile, also known as spreading adder and blowing viper, is found throughout the eastern United States. It is a common and well-known species in most parts of Indiana.

It frequents dry situations such as cultivated fields, old fence-rows, open pastures and roadsides; also dry hillsides and the banks of streams. At times it may be seen along water-courses and the shores of ponds and lakes. We have rarely observed it in meadows or on wet or marshy ground; nor have we noted it often about human habitations.

Although not often seen in the immediate vicinity of this lake, it is probably not uncommon in suitable situations, especially in dry sandy regions. It appears to be very well known among the inhabitants of the region, and is held in great dread by most of them: even its breath is supposed to be fatal. From its method of defending itself by appearing very terrible, a habit which has perhaps given its evil repute, it is one of the most interesting snakes in the region.

One was taken in Walley's woods on a bright day in the spring of 1901. When first approached it assumed a threatening attitude and gave vent to loud hisses; it then broadly flattened out the neck, and the bright colors and color-pattern, which had been more or less concealed by the scales, now stood out vividly, the color markings on the back of the neck standing out with especial clearness. When the snake found that none of those tactics availed, it stiffened out and appeared to be dead, and was easily picked up and placed in the collecting can.

During the summer of 1906 a large example of this species was seen on the shore of Lost Lake, but it escaped into a hole in the bank. In the autumn of the same year a young example about 5 inches long was captured near the ice office; and frequent reports of the species having been seen, were heard.

The bite of this snake is entirely harmless—even if it could be induced to bite. From the nature of its food, it is one of our beneficial snakes; it eats very few fishes, but subsists on frogs, mice, and insects, and their larvæ, or grubs. Instead, therefore, of meriting the persecution which it meets almost everywhere, it is well worthy of protection.

From all other snakes of this part of the State, this species may be known by its habit of flattening out both its head and body marvelously.

In color, it is brownish or reddish, with about 28 dark dorsal blotches, besides lateral ones and half-rings on the tail; sometimes the color is nearly uniform black. Vertical plate longer than broad, about equal to the occipitals; ventral plates 120 to 150; scales in 23 or 25 rows. Maximum length about 2 feet.

10. *Sistrurus catenatus* (Rafinesque).

PRAIRIE RATTLESNAKE.

This species, known also as the Massasauga, is likely to occur in all prairie regions from Ohio to Minnesota and southward. In Indiana it is known only from the northern portions of the State. It is the only poisonous snake occurring about Lake Maxinkuckee. All the other species found in that region or elsewhere in northern Indiana are entirely harmless. Formerly the Massasauga was abundant throughout this part of the State, but with the settling up of the country and the draining of the prairie grass-land and the marshes, it has become wholly exterminated in many places and practically so in many others. About Maxinkuckee, however, and elsewhere in Marshall County, it is far from extinct. It is apt to be found in any and all suitable places such as prairie meadows, about the borders of vanishing lakes, and in prairie marsh-ground anywhere.

In May, 1891, when the spring meeting of the Indiana Academy of Science was being held at Lake Maxinkuckee, several specimens were caught by members in attendance, chiefly in marshy ground about the lake. About 1896 a young man on the eastern side of the lake was bitten on the leg by one. The leg remained swollen for some time and complete recovery was very slow. On August 6, 1899, one was caught on Long Point between the Scovell and Walter Knapp cottages. It was 23 inches long and had five rattles. On August 3, 1900, one was killed two and one-fourth miles south of Arlington station. It was 18 inches long and had two rattles and a button. Several weeks earlier, near the same place, a dog was bitten by one, without fatal results. On August 26 a small one was killed on the east side of the lake near the T. W. Wilson cottage. On the same day one was killed in a field on the Hawk farm south of Culver. It was about 2 feet long and had nine rattles. Another young individual was killed September 3 on the east side, two and one-half miles southeast of the Maxwell cottage, and one with nine rattles was killed September 26, 1907, in a meadow on the Newman farm, four miles southeast of Culver.

These are all the records we have of the occurrence of the prairie

rattlesnake in the immediate vicinity of Lake Maxinkuckee. We have heard, however, of numerous examples being killed in marshy meadows northwest, west and south of the lake. In those regions there are numerous and considerable meadows of the wild grass or sedge, *Carex stricta*, which are cut in the early fall by farmers and others for hay or for use in the ice-houses, and other purposes. It is then that this venomous snake is met with most frequently.

Though habitually dwelling in marshy situations it is sometimes seen on higher, open ground. It is rarely seen in open woods or dry thickets.

We know but little about the habits or food of this snake. It apparently does not wander far but remains close about the particular marsh in which it makes its home. They are quiet and not easily disturbed or angered. When observed they will be still or quietly glide away unless interfered with. Then they will usually coil, assume a threatening attitude and rattle more or less. The rattling, however, soon ceases, to be renewed only when again provoked.

The Massasauga is known to feed on frogs, crawfish, meadow mice and shrews. We do not know that it ever feeds on fishes, but it is more than probable that it would not disdain to eat mud minnows or any other small fishes it might find in its swampy habitation.

The one fact that this is a venomous snake is sufficient reason for its extermination.

The species is viviparous, the young being brought forth alive. There are usually about six in a brood, each 4 to 6 inches in length when born. The birth of the young generally takes place about the first of September.

The prairie rattlesnake may be known from others of this region by the large, flat, triangular head on a slender neck, the presence of a deep pit between the eye and the nostril, the long, erectile, perforated poison-fang on each side of the upper jaw, and, usually, the presence of a rattle on the tail.

Color, brown or blackish, with about 7 series each of about 34 deep chestnut blotches, blackish exteriorly and edged with yellowish; a yellowish streak from pit to neck; body sometimes all black; scales in 23 or 25 rows; ventral plates 135 to 150. Length $2\frac{1}{2}$ to 3 feet.