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## A Survey of Reptiles and Amphibians of Buena Vista County, Iowa

JAMES L. CHRISTIANSEN<sup>1</sup>

*Abstract.* Snakes found, listed in order of abundance, were: *Thamnophis radix haydeni*, *Thamnophis sirtalis parietalis*, *Elaphe vulpina*, *Thamnophis sirtalis sirtalis*, *Opheodrys vernalis blanchardi*, and *Lampropeltis dolia triangularis*. *Pituophis melanoleucus sayi* was found in neighboring Cherokee County. Two hybrids involving the genus *Thamnophis* were found. *Eumeces septentrionalis septentrionalis* was the only lizard found, and *Ambystoma tigrinum tigrinum* the only salamander. *Rana pipiens pipiens* was the most abundant frog, and *Pseudacris triseriata triseriata* was the only other frog found. *Bufo americanus americanus* was the only toad found. *Chelydra serpentina serpentina*, *Chrysemys picta belli*, and *Trionyx spinifer hartwegi* were the only turtles found. There were no previous collections made of reptiles and amphibians in this county.

This study was undertaken when it was found that no survey of amphibians and reptiles had been made in this area. This, and the fact that snakes seemed rare in Buena Vista County, prompted Professor R. E. Smith to encourage the project. It had also been noted that frogs, other than the leopard frog, *Rana pipiens*, appeared to be rare or absent in most of the county. Therefore, the gathering of information on amphibians seemed desirable.

An attempt has been made to collect as many specimens as possible, to classify and study them, to compose maps of their distribution, and to describe hybrids when found. Maps of the county were obtained and many visits were made to farms to learn from the inhabitants where the heaviest reptile and amphibian populations existed. Specimens taken were measured, classified, and preserved or released near the point of their capture.

### MATERIALS AND METHODS OF COLLECTION AND PRESERVATION

Before collecting, the writer visited 108 farms strategically placed on each border of the county and within the county wherever conditions appeared favorable. Here farmers were asked how long it had been since they had seen a snake and what kind it was, even though the latter information was generally unreliable. The farmer was then asked if he would pick up any road kill and any live ones which he might be able to catch, calling the writer collect when the specimens were in his possession.

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After promising areas were found, collecting was begun. Early in the morning, periods following rains, or cool periods were times frequently used. Specimens were taken during periods of high temperature from under stones or logs and occasionally in shady spots. As a general rule it was almost useless to collect when the temperature was over 90° F. The most productive areas were found to be banks of streams and junk piles where there were many flat objects on the ground under which snakes would be found hiding from the sun. Also productive were large fallen logs in wooded areas, clusters of large flat stones, and the foundations of old houses and corn cribs.

When a snake was discovered, it was generally captured by the "leap and sprawl" method; when it was suspected that larger varieties might be found, a snake stick made from a golf club was used to pin the head down thus making it easier to grasp. Frogs also were caught by hand, although upon occasion a net was used where there was a heavy concentration of numbers. Turtles were obtained from fishermen, captured, or observed while sunning themselves on the edge of ponds, streams, and lakes.

In the laboratory snakes were fed leopard frogs, night crawlers, and mice of any variety. The specimens were studied, then released, except for hybrids and a few representative specimens of each species and subspecies which were preserved. Chloroform was most convenient for killing the specimens. Severe convulsions were not a problem. Preservation was accomplished by making repeated injections of a 20-30% formaldehyde solution into the coelom and digestive tract with a 20-cc syringe. This was followed by immersing the animal in a 5% formaldehyde solution in jars. The jars were labeled with the date, area of capture, length of specimen, and generic and specific names.

#### DISCUSSION

*Thamnophis sirtalis sirtalis*, the eastern garter snake, was taken in Buena Vista County about one hundred eighty miles west of its range as described by Conant. This subspecies differs from *Thamnophis sirtalis parietalis* only in that it lacks the bright red dorso-ventral bars on the sides. The question may arise that this may be *T. sirtalis parietalis* whose red bars did not develop due to some genetic defect. The author believes that this is unlikely because large numbers of this subspecies were taken in the two colonies located.

The specimen described was taken in Barnes township. It was found on the lawn of a house about ten feet from a dry

stream in a hilly, forested area. This was about one-half mile from the Little Sioux River. This subspecies ranks fourth in relative population. *Rana pipiens* was abundant in the area and served as a source of food.

The other colony located was in the southern part of the county in Providence township.

*Thamnophis radix haydeni*, the western plains garter snake, was taken in Buena Vista County well within its range as described by Conant. This species is distinctive because the first lateral stripe is on scale rows 3 and 4. It is by far the most abundant snake in Buena Vista County.

The specimen described was taken in Poland township about seven hundred feet from the west side of Pickerel Lake. It was attempting to hide under loose stones of an old well in an abandoned farm yard. *Rana pipiens* was plentiful in this area, providing at least a part of the diet.

This species was taken throughout most of the county.

*Thamnophis sirtalis parietalis*, the red-sided garter snake, was taken in Buena Vista County well within its range as described by Conant. This species is distinctive in that it has bright red dorso-ventral bars on its sides. These bars may be wide or so narrow as to be almost invisible depending upon how much the skin is stretched, either by inhaling or by a food lump.

The specimen described was found beside a swift stream in rugged, forested country. It was crawling through tall brome grass. This subspecies is also very numerous in Buena Vista County, ranking second only to *T. radix*.

*Elaphe vulpina vulpina*, the fox snake, was taken well within its range. This species is distinctive because of its gray background color, dark brown or black square blotches on its back and sides, divided anal plate, square nose, and large size.

The specimen described was especially interesting because it had been shot through the neck, had gone into convulsions, rolled over on its back and "died", according to the farmer who shot it. The author captured the snake two weeks later and kept it under observation for three more weeks. It was then chloroformed because the bullet had disrupted its swallowing mechanism and it was starving.

A female captured in Newell township laid 15 eggs on July 10, all of which hatched in the laboratory in a bed of moist saw-

dust on August 21 and 22, except for two which had been opened to check on progress.

*E. vulpina* is the third most numerous species in Buena Vista County. It has, in every instance, been found near a corner or house where its main diet is rats and mice.

*Ophedryx vernalis blanchardi*, the smooth green snake, was taken well within its range as described by Conant. This species is distinctive in that it is small, very fragile, and has no markings on either dorsal or ventral surface.

The specimen described was taken by a farm family after the animal had been injured by a car in Providence township. Other specimens had been observed in that area, which appears to have the only remaining colony in Buena Vista County. Conversations with residents indicate that this colony is also disappearing. This colony is located on the Raccoon River, which is Mississippi drainage area. From what could be learned, they never did exist along the Little Sioux River, which is Missouri drainage area.

*Lampropeltis doliata triangulum*, the eastern milk snake, was taken in Buena Vista County about fifty miles southwest of its range as described by Conant. This subspecies is distinguished by the black blotches on its dorsal surface, surrounded by bright red, on a white background. A very definite "Y" marking on top of the head serves to help distinguish it from the western subspecies.

The specimen described was taken in a gravel pit near Linn Grove in Barnes township. A young of the same subspecies was taken on a street in the town of Linn Grove. This appears to be the only colony in Buena Vista County.

*Pituophis melanoleucus sayi*, the bull snake, was taken in Cherokee County where it exists in heavy concentration. This species is distinguished by a yellow background color, square brown dorsal blotches, a single anal plate and a pointed rostral.

The reason this species is included here is that it occurs in heavy concentration in the vicinity of the Little Sioux River in Cherokee County. This river runs through neighboring Buena Vista County as well. Therefore the species should logically occur in Buena Vista County although no specimens were taken here. Statements of the local population were unreliable because they consistently referred to *Elaphe vulpina* as bull snakes, and *Elaphe vulpina* was very common in the area.

The specimen described was taken as it crossed a road out-

side the town of Quimby, about a half mile from the Little Sioux River in the vicinity of a series of gravel pits.

**Hybrid No. 1** was taken in Newell township sunning itself about fifty feet from the Raccoon River. This specimen had a particularly nasty temper and succeeded in meeting my hand teeth first on two different occasions before it was finally placed in a cage. Once in captivity it ate well, preferring *Rana pipiens* to anything else.

The distinguishing characteristics are as follows: scales keeled, one dorsal and two lateral stripes with the lateral stripe on scale rows 2 and 3, and red bars on the sides.

This would indicate that the specimen was *Thamnophis sirtalis parietalis*, but the following observations disagree: anal plate divided rather than single, the ventrals had a broken dark stripe running from head to tail, and a dark stripe was present below the first lateral stripe extending on to ventrals. These observations seem to indicate *Natrix grahami*, Graham's water snake, whose range is described by Conant as coming nearly to Buena Vista County along the Raccoon River.

Although the author knows of no cross between the genus *Natrix* and genus *Thamnophis*, this hybrid seems to indicate that such a cross may have occurred.

**Hybrid No. 2** was taken in Hayes township in tall grass beside a gravel pit. This specimen ate well in captivity taking both small fish and frogs.

The distinguishing characteristics were: one dorsal and two lateral stripes, with bright red bars on the sides indicating *T. sirtalis parietalis*.

Conflicting with this were the following characteristics: the first lateral stripe was on scale rows 3 and 4, and the lips were strongly barred with black. These characteristics indicate *T. radix*.

Taking under consideration the fact that both species were found in the same area and that the unrelated species of genus *Thamnophis* frequently interbreed, it seems quite likely that this hybrid was a cross between *T. radix* and *T. sirtalis parietalis*.

*Eumeces septentrionalis septentrionalis*, the northern prairie skink, was taken in Buena Vista County well within its range. This species was distinguished by the wide dorsolateral stripe

The specimen described was taken in a farm yard in Barnes township beside a dry stream. In every case this species was found between the bark and the wood of fallen trees or under logs in the tall grass. Young found out-numbered the adults two to one. Another colony was found about two miles west of this one. The second colony was discovered in a gravel pit. Both colonies were within a half mile of the Little Sioux River.

*Chelydra serpentina serpentina*, the snapping turtle, was taken in Buena Vista County well within the range described by Conant. This species was distinguished partially by its thick neck, large size, and small plastron.

The specimen described was taken in Hayes township in a flooded gravel pit while sunning itself. The snapping turtles occurred wherever there was water in Buena Vista County, though they rarely reached a heavy concentration in any area, probably because they are favored targets for would-be pot hunters.

*Chrysemys picta belli*, the western painted turtle, was well within its range. This species was distinguished by its olive green carapace with its network of yellow lines, its green neck with yellow stripes, and its bright yellow carapace with branching design.

The specimen described was taken in Poland township in the shallow water on the edge of Pickerel Lake. This species could be found in any of the larger bodies of water in Buena Vista County, though it was not as wide spread as *Chelydra serpentina*, probably because it did not migrate as far. Where it is found, it is generally found in large concentrations.

*Trionyx spinifer hartwegi*, the western spiny, soft shelled turtle, was taken in Cherokee County, well within the range described by Conant. This species could be distinguished by its large, flat, leathery shell with short spines on the anterior end and down the center of the carapace. Its striped head, neck, and feet also served to aid in identification.

It is included here because the local conservation officer, Mr. Frank Starr, has records of this species having been caught in the Little Sioux River about ten miles inside neighboring Cherokee County.

*Ambystoma tigrinum tigrinum*, the eastern tiger salamander, was found well within its range. This species was distinguished by its slimy skin, yellow blotches on sides, and small round, yellow ventral blotches.

This specimen was found in the basement of a house in Lee township. They occur in this area in great numbers. That this is a swampy area with no fish may be the reason for their abundance here. Specimens had been taken in years past in this section of the township, as they were crossing roads. This is the only colony the writer found in Buena Vista County.

*Bufo americanus americanus*, the American toad, was common. This species was distinguished by one to two large warts on each dark dorsal blotch, parotoid separated from cranial crests and small, sometimes-connected ventral blotches.

The specimen described was taken in Grant township between two bayous of the Raccoon River in the midst of a large, heavily concentrated colony of *T. radix*. Its large size probably made it too big a project for any garter snake to consider for a meal. *Bufo americanus* occurred throughout the county.

*Rana pipiens pipiens*, the northern leopard frog, was taken in Buena Vista County. This species was distinguished by the slimy skin, olive green background color, large size and dorso-lateral ridges.

The specimen described was taken in Hayes township on the edge of Storm Lake. It was one of many caught to provide food for various snakes. *Rana pipiens* occurred in large numbers throughout Buena Vista County.

*Pseudacris triseriata triseriata*, the western chorus frog, was taken in Buena Vista County. This species can be distinguished by its small size, smooth skin, three definite brown stripes, with the center stripe dividing, and the one brown dorsal stripe running from the eye to the groin.

The specimen described was taken in Hayes township on the shore of Little Storm Lake. This colony was particularly well populated and many were captured in one evening. There were three colonies found in Buena Vista County, the other two being along the Little Sioux River.

## REPTILIA

ORDER: Squamata

SUBORDER: Serpentes (Ophidia)

*Thamnophis sirtalis sirtalis* (Eastern garter snake)

Barnes township, section 1, July 28, 1960

Total length, 64.5 cm; length tail, 17.5 cm; length head, 1.8 cm; rows of scales, 19; first lateral stripe, scale rows 2 and 3; dorsal stripe, scale rows 9, 10, 11; ventrals, 158; scales, keeled; anal, single; stripes, grayish-yellow; background color, grayish-black; belly, bluish; spots, not apparent

*Thamnophis radix haydeni* (Western plains garter snake)

Poland township, section 1, August 22, 1960.

Total length, 70.4 cm; length tail, 15.3 cm; length head, 2.1 cm; rows of scales, 21; first lateral stripe, scale rows 3 and 4 (yellow); dorsal stripe, scale rows 10, 11, 12 (orange); ventrals, 159; scales, keeled; anal, single; background color, almost completely black but checkers are present; belly, bluish with two black half-moons on each ventral; lips, black barred; coloration of ventrals, black in front about 4 in. from head, becoming more intense toward the head.

*Thamnophis sirtalis parietalis* (Red-sided garter snake)

Brooke township, section 25, July 19, 1960

Total length, 66.2 cm; length tail, 15.2 cm; length head, 1.8 cm; rows of scales, 19; first lateral stripe, scale rows 2 and 3; dorsal stripe, scale rows 9, 10, 11; ventrals, 158; scales, keeled; anal, single; vertical bars, bright red extending almost to tail, red occurring above first lateral stripe only; belly, brownish-white with light brown on the sides of the ventrals.

*Ophedrys vernalis blanchardi* (Western smooth green snake)

Providence township, section 26, August 8, 1960

Total length, 37 cm; length tail, 12.6 cm; length head, 0.8 cm; rows of scales, 15; ventrals, 136 (male); scales, smooth; anal, divided background color, bright yellow-green; belly, creamy white with green spots (specimen turned blue in formaldehyde).

*Lampropeltis doliata triangulum* (Eastern milk snake)

Barnes township, section 8, March, 1959

Total length, 77 cm; length tail, 9.9 cm; length head, 1.8 cm; rows of scales, 21; ventrals, 208; scales, smooth; anal, single; blotches, 3 rows, reddish-brown, bordered with black; background color, grayish-white; collar, none; belly, white with irregular, checkered black blotches; head markings, white triangle bordered with black.

*Elaphe vulpina vulpina* (Fox snake)

Newell township, section 30, June 30, 1960

Total length, 95 cm; length tail, 12.6 cm; length head, 2.8 cm; rows of scales, 25; ventrals, 204; dorsal blotches, 42, almost pure black; scales, weakly keeled; anal, divided; background color, grayish, very little brown; arrangement of blotches, one row of bark blotches down back, two rows alternating blotches on each side, sometimes continuing onto ventrals; belly, white, strongly blotched with irregular alternating black blotches.

*Pituophis melanoleucus sayi* (Bull snake)

Quimby, Cherokee County, October 7, 1960

Total length, 96.3 cm; length tail, 13.5 cm; length head, 2.9 cm; rows of scales, 27; ventrals, 123; dorsal blotches, 58 to tail, 12 on tail; scaled, keeled; anal, single; background color, yellowish, becoming brownish on keels of scales on back; color of dorsal blotches, brown bordered with black becoming toward head; lateral blotches, 3 rows of alternating brown blotches; belly, boldly blotched with irregular brown half-moons; rostral, one, bold, sharply pointed.

HYBRID NO. 1

Newell township, section 30, June 22, 1960

Total length, 74.8 cm; length tail, 15.8 cm; length head, 2.4 cm; rows of scales, 19; ventrals, 154; first lateral stripe, on rows 2 and 3, yellowish; dorsal stripe, bright on rows 9, 10, 11; scales keeled, anal, divided; background color, olive green with dark stripe below first lateral stripe extending on to ventrals; belly, dark olive-buff, broken dark stripe down center; black half-moons on a few ventrals; facial markings, chin white, extending down ventral neck, slight traces of yellow around the eye.

HYBRID NO. 2

Hayes township, section 32, August 13, 1960

Total length, 63 cm; length tail, 11.5 cm; length head, 1.5 cm; rows of scales, 21; ventrals, 164; first lateral stripe, on rows 3 and 4, pale yellow; dorsal stripe, on rows 10, 11, 12, orange-yellow; scales, keeled; anal, single;

lips, black barred; vertical bars, bright red above and below first lateral stripe, mixed with some yellow; background color, olive-black, with one row of black spots above first lateral stripe, occurring between red bars; belly, light olive-yellow, with irregular half-moons.

**SUBORDER: Lacertilia**

*Eumeces septentrionalis septentriolans* (Northern prairie skink)

Barnes township, section 1, August 9, 1960.

Total length, 10.5 cm; length tail, 3.5 cm (lost tip of tail); dorsal background color, olive-brown middorsal stripe, pale brown, 5-6 scales wide, split at times by a dark line; dorsolateral stripes, 2 on each side, separated by a dark olive stripe and each bordered with dark olive; post-mental scales, 2; ventral color, greenish-white.

**ORDER: Chelonia**

*Chelydra serpentina* (Snapping turtle)

Hayes township, section 32, gravel pit, June 23, 1960

Total length, 78.6 cm; length carapace, 39 cm; length tail, 36 cm; estimated weight, 25 lb; head, heavy and large with sharp upper and lower jaws; neck, very thick, quite short, about the same diameter as head; feet, strong and heavily clawed; color of carapace, brown, no color markings; carapace, most of the sharp edges worn off, showed a lot of corrosion; color of plastron, lighter brown than carapace, no color markings; plastron, very small, smooth; ventral skin, gray-brown, with indefinite small light spots.

*Chrysemys picta belli* (Western painted turtle)

Total length, 20.5 cm; length tail, 4.5 cm; length carapace, 13 cm; color carapace, olive-green with a network of thin yellow lines; marginals, yellow bars, some red around outer edges; plastron, bright yellow background color with bright red design consisting of heavy arms coming out from a heavy midline; head and neck, many yellow stripes running from the anterior of head to posterior of neck on an olive background; tail, many yellow stripes running posteriorly legs, many yellow stripes running to end of phalanges feet, strongly webbed with yellow webs and claws on end of 3 rows.

*Trionyx spinifer hartwegi* (Western spiny softshelled turtle)

Cherokee County, July 28, 1960

Total length, 22.7 cm; length carapace, 14.5 cm; length tail, 2.7 cm; length head and neck, 7.5 cm; feet, strongly streaked and spotted with black and yellow, highly webbed with claws occurring on first 3 phalanges; blotches, small and black on carapace, fusing to form a broken ring around the outside background color, olive brown on carapace and head; carapace, leathery, with lumps showing skeleton underneath; plastron, milky-white with small black blotches forming a ring around outer extremities of shell; spines, a single row of 6, heading posteriorly, disappearing then re-appearing about 2 inches from posterior end of carapace as 4 rows, spines also covered anterior edge of carapace.

**AMPHIBIA**

**ORDER: Caudata**

*Ambystoma tigrinum tigrinum* (Eastern tiger salamander)

Lee township, section 14, September 19, 1960

Total length, 14.5 cm; length tail, 5.4 cm; dorsal background color, dull black; dorsal blotches, olive-yellow, round, small, occurring on tail, brighter yellow blotches on sides; ventral background color, yellow-gray; ventral blotches, small, round, yellow, the brighter ones occurring on sides, dull yellow blotches on belly, tail free of blotches; lower jaw, yellow blotches occurring in a line just under lips.

*Bufo americanus americanus* (American toad)

Grant township, section 35, September 14, 1960

Total length, 10.2 cm; large warts, generally only one or two on each blotch, largest wart 0.6 cm in diameter; dorsal blotches, black, generally clearly outlined with yellow along middorsal stripe, indefinite on sides; ventral blotches, small, sometimes connected, more connected on sides and on shoulders; calf, heavy black blotches with enlarged warts; tibia, 2.7 cm; dorsal background color, light brown in center becoming yellow on sides; ventral background color, pale yellow; middorsal stripe, light yellow, extending from between cranial crests to anal; paratoid, separated from cranial crests, 1 cm in length.

*Pseudacris triseriata triseriata* (Western chorus frog)

Hayes township, section 5, June 27, 1960

Total length, 2.7 cm; length tibia, 1.1 cm; dorsal background color, yellow-green; dorsal stripes, three definite brown stripes, the center one the longest, extending from between eyes and dividing about 1 cm from rump; lateral stripes, one brown extending from nostril through eye to groin; upper jaw, light line along upper lip; ventral color, creamy-white with a few tiny spots on thorax; hind feet, slightly webbed; phalanges, small disks on the end of each; tympanic membranes, small, glossy tan.

*Rana pipiens pipiens* (Northern leopard frog)

Hayes township, section 5, August 22, 1960

Total length, 6.2 cm; length tibia, 4.1 cm; dorsal background color, olive green dorsal blotches, definite black with bright yellow borders occurring in 2 to 4 rows between dorsolateral ridges, also occurring on sides and legs; dorsolateral ridges, yellow, beginning above each nostril, moving over eye and continuing anteriorly to leg; ventral, white becoming rough on thigh and rump; upper jaw, marked by white line under eye; tympanic membrane, blue-yellow with tiny black blotches; hind feet, strongly webbed phalanges, sharp.

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