

A Preliminary Study of the Turtle Population Of a Northern Indiana Lake

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Introduction

A study of the turtle population of Dewart Lake, Kosciusko County, Indiana, was undertaken to determine the species of turtles present in a typical northern Indiana lake of glacial origin, and to estimate the population of the turtles in this lake. The weight, length, sex, and age of each individual turtle were determined and recorded. The area of operation for this study was a 55 acre bay on the south-east corner of Dewart Lake on which the David Worth Dennis Biological Station of Earlham College is located.

Methods

Two rectangular traps, one 5' x 2½' x 2½' and one 4' x 2' x 2', made of chicken wire with a wooden frame and an entrance funnel one foot shorter than the trap, were used to capture the turtles. These traps were baited with freshly killed fish, and were checked and emptied daily from predetermined areas in the bay. A Fyke net and various hand-nets were also used to capture individuals. The weight of each turtle was determined to the nearest gram; while the length, the curvature of the carapace, was determined to the nearest 10th of a centimeter. Each species of turtle was found to have different characteristics for determining the sex of the individual, such as size, coloring, or special adaptations for copulation. Thus no one system could be used to distinguish sex. Age was difficult to determine and the results of counting the annuli on the scutes of the carapace was so inconclusive that the data were rejected. This unreliability exists because the annuli became rubbed off, or lost during the natural course of the turtle's life. Each turtle that was caught was marked by notching the carapace so that recaptures could be identified and recorded. Thus, by knowing the number of new captures and the number of retakes, the turtle population of the area was estimated.

Results and Discussion

During this investigation approximately 575 turtles were captured, consisting of the seven following species: *Chelydra serpentina*, common snapping turtle; *Chrysemys picta marginata*, midland painted turtle; *Emydoidea blandingi*, Blanding's turtle; *Graptemys geographica*, common map turtle; *Pseudemys scripta elegans*, red-ear turtle; *Sternotherus odoratus*, musk or stinkpot turtle; and the *Trionyx spinifer spinifer*, eastern spiny softshell turtle. Of these the most common species was the painted turtle with 341, or 59% of the total number caught. The musk turtle was also very abundant with a total of 197, or 34%, of the total number caught. The remaining 7% of the turtles were comprised of the other five species. So few of these were captured that

results were inconclusive as to the relation of weight, sex and length. Relations of length and weight were clearly shown in the painted and musk turtles as illustrated in the four tables in the appendix. Figure 1 illustrates that female painted turtles tend to be larger than the males. However, no such difference is shown in Figure 2, which compares the weights of the musk turtles since differences between the sexes of this species are due to adaptations for copulation, rather than to weight. Figures 3 and 4 show that the male and female painted turtles also vary in length while both sexes of the musk turtles are approximately the same length. This latter similarity may be due to many individuals living at maximum size or perhaps it is due to a particular year class.

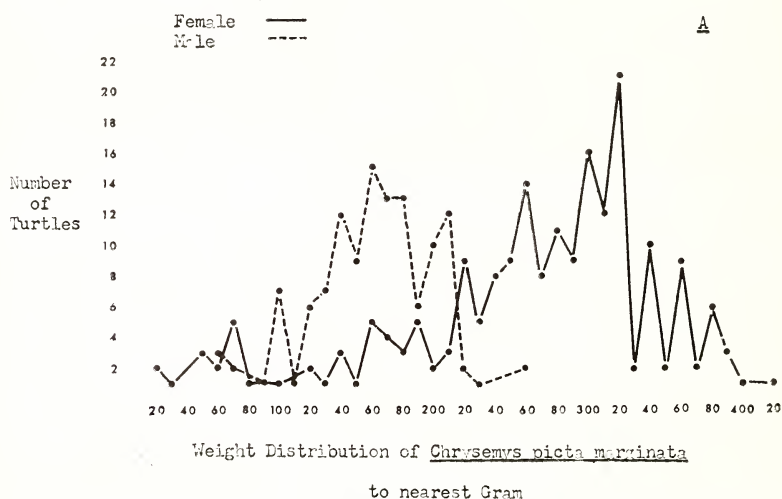


Figure 1. Weight distribution of Male and Female *Chrysemys picta marginata*.

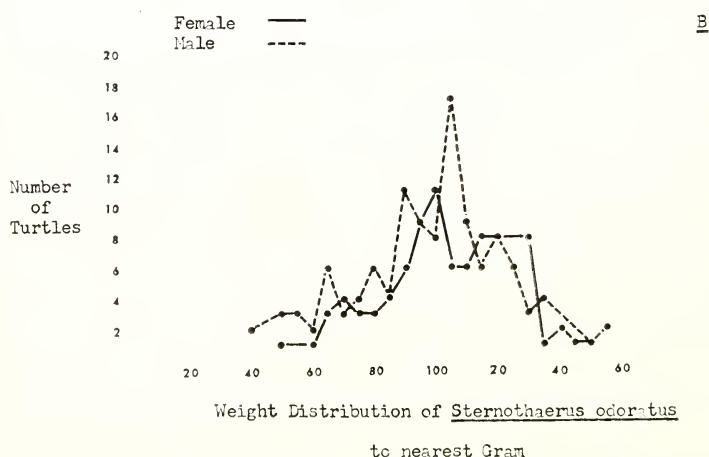
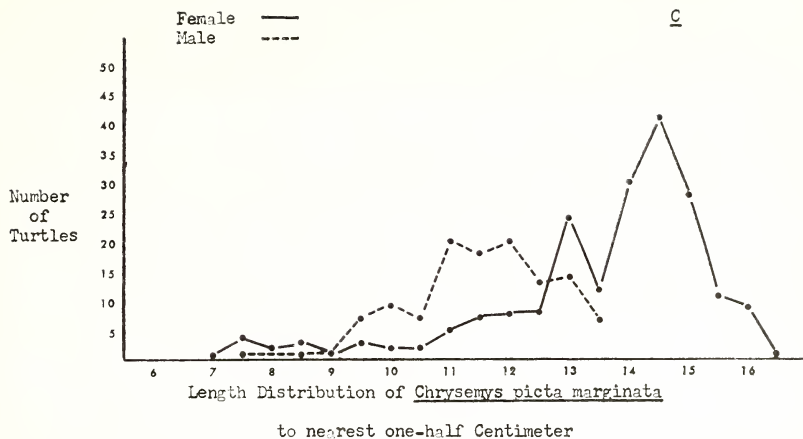
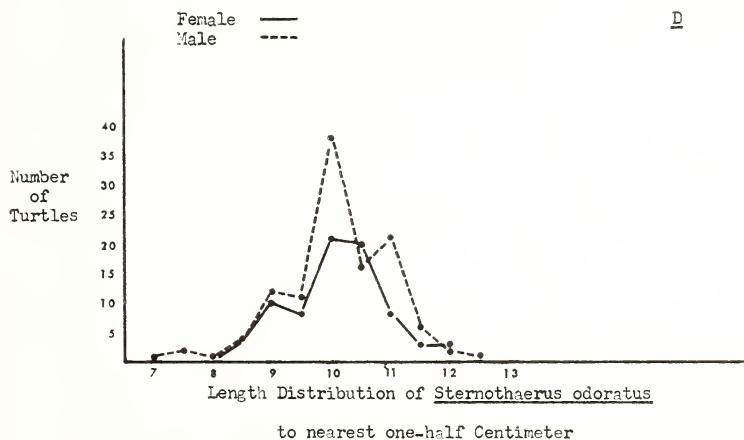


Figure 2. Weight distribution of Male and Female *Sternotherus odoratus*.

Figure 3. Length distribution of Male and Female *Chrysemys picta marginata*.Figure 4. Length distribution of Male and Female *Sternotherus odoratus*.

Of the seven species of aquatic turtles collected the painted turtles and the musk turtles were most abundant simply because optimal conditions for living were present, these being shelter and food, both of which were given by the dense vegetation of the lake. Many young of the musk, painted and softshell turtles were captured but none of the snapping, red-ear, map and Blanding's turtles which would seem to indicate that either the young of these four species are not mobile or they live elsewhere until they are several years old. In the painted turtle more females were caught which would tend to indicate that they are more mobile or possibly more aggressive. More male musk turtles were collected suggesting that in this species, the male is more mobile. Turtles were collected either in the morning or in the afternoon. At both times the painted and musk turtles were

present, but the other five species were gathered only in the morning after the traps had been out all night. Thus, it appears that these turtles are mainly nocturnal in their habits.

Turtles caught in the traps were at least five years old since by then they had attained a size large enough so they would not fall through the holes of the chicken wire. Smaller turtles were caught in hand-nets while they sunned in the vegetation or on sandy banks. The turtles that sunned, such as the painted, Blanding's, red-ear, softshell, and map turtles, had less algae growing on their carapaces than the musk and snapping turtles which spend all of their time on or near the bottom of the lake in the vegetation (Carr, Handbook of Turtles). This would indicate that the lack of moisture caused by the drying action of the sun might have some control over algae growth.

The population of the bay was estimated using the Schnabel mark-and-recapture method in which the total daily catch, the daily recaptured turtles and the number of turtles not returned to the lake were recorded. From this the estimated population for the 55 acre bay was found to be 2736 turtles (all species were included). Calculating the 95% confidence interval, the estimated population fell between 2145 and 3772 turtles. Of the 575 turtles collected, 51 were recaptured. This is about 8.9% recapture rate which with the figure of the estimated population indicated that the turtle population of the bay was not small. All turtles were put back into the lake at one place in order to see if they would return to where they had been originally caught. Several did return which might tend to indicate a homing tendency, although insufficient data were obtained on this characteristic to tell with any degree of certainty.

Literature Cited

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3. Pope, C. 1939. Turtles of the United States and Canada, Alfred A. Knopf, New York.