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POPULATION ESTIMATES OF THE RINGED SAWBACK TURTLE, *GRAPTEMYS OCULIFERA*: YEAR ONE REPORT

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INTRODUCTION

The ringed sawback, *Graptemys oculifera*, is known only from the Pearl River and its larger tributaries in Mississippi and Louisiana. This turtle was listed as a threatened species by the U.S. Fish and Wildlife Service in 1986. Estimates of ringed sawback population sizes were first made for three populations (Ratliff Ferry, Lakeland, Monticello) in 1988 and for two additional populations (Carthage, Columbia) in 1989 (Jones and Hartfield, 1995). Additional estimates were made at these five sites in 1994 and in 2002. Density of turtles at each site generally had remained stable over the 14 year period between the first and last sampling periods.

The objectives of this project were to estimate population sizes of the ringed sawback at Ratliff Ferry, Lakeland, and Monticello, employing the same techniques used in 1988, 1994, and 2002 so that results were comparable to those found earlier. Periodic estimates of population sizes at these sites is necessary to evaluate both short and long term trends and fluctuations in the numbers of turtles at each. Additionally, all of the turtles captured during previous population estimates were permanently marked, so recaptures of permanently marked turtles during this study provided additional data on growth and survivorship of this species.

METHODS AND MATERIALS

The Lakeland and Monticello study areas were 4.8 km long reaches of the Pearl River , and the Ratliff Ferry study area was 3.2 km long. Ringed sawbacks were captured during a one-week sampling period at each of the three sites in April and May, 2008. Turtles were captured in basking traps, sexed, measured, and marked as

described in Jones and Hartfield (1995). Marks applied to turtles included permanent marking by drilling holes in the marginal scutes of the carapace using Cagle's numbering system, and temporary marking using flourescent tree-marking paint. Recaptured turtles which were permanently marked during earlier studies were marked with paint only. Both of these techniques have been used previously and have proven to be harmless to the turtles. Painted and unpainted turtles were counted during five separate basking surveys at each of the three study sites using both binoculars and a spotting scope. The data collected during the basking surveys were used to produce mark-recapture estimates of *Graptemys oculifera* population sizes at each study area. Estimates were produced with the program NOREMARK (White, 1996) using the joint hypergeopetric maximum likelihood estimator.

RESULTS

A total of 196 *Graptemys oculifera* were captured and marked during this study (Table 1). Slightly over 60% of these were females, and only one juvenile was captured at Monticello (Table 1.) Fifteen of these turtles had been captured during earlier studies (Table 1). Of these 16 turtles, at least 10 had been initially marked at least 18 years ago (Table 2). Population estimates ranged from 378 at Monticello to 950 at Ratliff Ferry (Table 3). Density estimates ranged from 79 to 297 *Graptemys oculifera* per kilometer of river (Table 4).

Table 1. Number of *Graptemys oculifera* captured at three sites on the Pearl River. The marked column is the number of previously marked turtles (those marked from 1988 to 2002) captured during the study, and the last column is the percentage of turtles captured that had been previously marked.

Location	**Male**	**Female**	**Juvenile**	**Total**	**Marked**	**% recaptures**
Ratliff Ferry	30	51	0	81	5	6.2
Lakeland	22	53	0	75	6	8.0
Monticello	24	15	1	40	5	12.5

Table 2. *Graptemys oculifera* recaptured from three sites on the Pearl River in 2008 that had been previously marked in earlier studies.

Site	Sex	Date when first marked	Age class when first marked
Ratliff Ferry	Male	8/30/1988	adult
	Female	6/3/1988	adult
	Female	4/12/1990	juvenile
	Female	5/21/1996	adult
	Female	4/18/2002	adult
Lakeland	Female	7/13/1988	juvenile
	Female	8/31/1988	adult
	Female	9/14/1990	juvenile
	Female	5/14/2002	juvenile
	Female	5/15/2002	adult
	Female	5/15/2002	adult
Monticello	Male	6/23/1988	juvenile
	Male	9/26/1990	adult
	Male	5/1/2002	adult
	Male	5/2/2002	adult
	Female	9/8/1988	adult

Table 3. Population estimates for *Graptemys oculifera* at three sites on the Pearl River at four times from 1988 to 2008. Numbers in parentheses are 95% confidence limits of the population estimates.

Location	**1988**	**1994**	**2002**	**2008**
Ratliff Ferry	1117(871-1494)	1150(1008-1329)	1474(1279-1723)	950(840-1090)
Lakeland	698(581-860)	407(323-536)	753(627-929)	895(762-1074)
Monticello	727(640-836)	512(434-617)	494(401-581)	378(300-496)

Table 4. Density estimates for *Graptemys oculifera* at three sites on the Pearl River at four times from 1988 to 2008. The Lakeland and Monticello study areas are each 4.8 km in length, and the Ratliff Ferry study area is 3.2 km in length

Location	**1988**	**1994**	**2002**	**2008**
Ratliff Ferry	349	359	461	297
Lakeland	145	85	157	186
Monticello	151	107	103	79

DISCUSSION

Population estimates were stable to increasing at Ratliff Ferry through 2002, but in 2008 were approximately 40% lower than the average of the three previous estimates. Lakeland was also relatively stable from 1988 through 2002, but was approximately 44% larger in 2008 relative to its three previous estimates. Monticello population estimates have generally declined since 1988, and in 2008 showed a 65% decrease relative to the three previous population estimates at this site.

Graptemys oculifera has its highest density, as it has for the last 20 years, at Ratliff Ferry (297/km; Table 4), even though the population appears to have experienced

a decline over the past six years.

Sixteen *Graptemys oculifera*, five at two sites and six at the third, had been previously marked during earlier studies at these localities (Table 1). Five of these were males and the remainder was females (Table 2). Five of these were juveniles when marked but the rest were adults. Assuming that males mature at 3.5 years of age and females mature between 10 and 16 years of age (Jones and Hartfield, 1995) then several of the turtles captured during this study were a minimum of at least 31 years old.

Two additional populations, at Carthage and at Columbia, will be evaluated in 2009, and further analyses of population trends for the species as a whole will be conducted once those data have been collected.

LITERATURE CITED

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