THE EFFECT OF THE SLIDER TURTLE "Pseudemys Scripta Scripta" (SCHOEPFF) ON THE PRODUCTION OF FISH IN FARM PONDS [1]

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ABSTRACT

Four similar one-quarter-acre ponds were stocked with 1,500 bluegill, *Lepomis macrochirus* Rafinesque, and 100 largemouth black bass, *Micropterus salmoides* (Lacepede), fingerlings per acre in the spring of 1950. Two of the ponds were enclosed with board fences and stocked with slider turtles, *Pseudemys scripta scripta* (Schoepff) at the rate of 100 per acre. The four experimental ponds were fertilized and managed identically. The ponds were drained in the fall of 1950, and the average yield of fish in the ponds containing turtles was compared to that in the control ponds. It was found that the average yield of fish in the ponds containing slider turtles was approximately 258 pounds per acre while in the control ponds it was 264 pounds per acre.

The contents of 58 slider turtle stomachs that were trapped from various ponds in Central Alabama were analyzed and it was found that the food consisted of approximately 80 percent vegetable matter and 20 percent animal matter. Filamentous algae made up approximately 45 percent of the total diet while fish constituted less than 3 percent.

INTRODUCTION

The object of this investigation was to determine experimentally if slider turtles, *Pseudemys scripta scripta* (Schoepff), which are found abundantly in ponds in Central Alabama, appreciably decrease the yield of fish in ponds and to determine if any decrease in yield was the result of predation on fish or competition with fish for food.

A search revealed no literature regarding the effect of turtles on the yield of fish in farm ponds. However, the food habits of several species of turtles that occur in the Southeast—not including the subspecies used in this experiment—have been determined. Lagler (1943) found that the major food items in order of decreasing importance used by musk turtles, *Sternotherus odoratus* (Latreille) in Michigan consisted of fish carrion, aquatic insects, mollusks and aquatic plants while the diet of snapping turtles, *Chelydra serpentina* (Linnaeus), consisted of aquatic plants, fish carrion, crayfish, mollusks and aquatic insects. Alexander (1943) analyzed the stomachs of 470 snapping turtles collected in Connecticut and reported that aquatic plants and fish were of equal importance as food with crayfish next. He also stated that food varied widely between habitats, according to the availability of various food groups. Minyard (1947), studying the slider turtle, *Pseudemys scripta troostii* (Holbrook), in Louisiana, made analyses of 110 stomachs containing food and found that plant materials constituted more of the food than animal materials. She also stated that availability influenced the relative abundance of food organisms found in the turtle stomachs. Pope (1939) stated that most species do not confine themselves to either plants or animals.

METHODS

For similar one-quarter-acre experimental ponds at Auburn, Alabama, which were approximately 160 feet long and 69 feet wide were used in this investigation. The ponds were 2 feet deep at one end and 6 feet deep at the other, thus giving an average depth of 4 feet. The bottoms of the ponds were free from stumps and rooted vegetation. Each pond received water from a common water supply which was furnished by a small stream. In order to prevent contamination with stream fish, the water was filtered through gravel before entering the ponds. The outlet of each pond consisted of a 4-inch iron stand-

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pipe which was 6 feet in height. Since the standpipes were connected to the drain line by means of elbow joints, the ponds could be drained completely by pushing the normally vertical standpipes down to a horizontal position on the pond bottom.

A board fence 16 inches high was constructed around each of two of these ponds to prevent escape of the turtles. While the ponds were used in this investigation, the board fences were periodically inspected and repaired.

The ponds were stocked at the rate of 1,500 bluegill and 100 largemouth bass fingerlings per acre. The bluegill were stocked on January 18, 1950, and the largemouth bass on May 8, 1950. The two fenced ponds, in addition to being stocked with fish, were stocked with slider turtles at the rate of 100 per acre on January 1, 1950. The turtles stocked in each pond ranged in size from one-half to 3 pounds and consisted of about equal numbers of males and females. The turtles were marked for future identification, weighed, measured and sexed, as described by Cagle (1939, 1944, 1946, 1948) before being released in the ponds.

All ponds were fertilized as recommended by Swingle (1947); each pond received 1,378 pounds of fertilizer per acre during the experiment. All ponds were drained during the third week of October, 1950. The fish and turtles in each pond were removed, counted and weighted; carapace and plastron measurements were also made on each turtle. Weights of fish recovered from ponds containing slider turtles were compared with weights from control ponds.

The turtles caught from local ponds as the result of daily trapping operations to test the effectiveness of certain turtle traps were used for food habits studies. For the most part, stomachs were removed and analyzed immediately after the turtles were taken from the traps.

RESULTS AND DISCUSSION

Upon draining the experimental ponds it was found that the average yield of fish in the control ponds did not vary appreciably from that of the ponds containing turtles. The average yield of fish from the control ponds was 263.9 pounds per acre while in the ponds containing turtles it was 257.5 pounds per acre (Table I). This provides strong evidence that slider turtles will not decrease the yield of fish in farm ponds to a measurable extent.

TABLE I

WEIGHTS AND NUMBERS OF TURTLES AND FISH RECOVERED PER ACRE WHEN PONDS WERE DRAINED, OCTOBER 16, 1950

Pond	*Turtles*		*Bass*		*Bluegill*		*Total Pounds of Fish*	*Average Pounds of Fish*
	No.	*Pounds*	*No.*	*Pounds*	*No.*	*Pounds*		
F-3	80	107.84	72	29.12	76,492	247.88	277.00	257.50
F-4	52	37.32	88	61.20	29,109	176.80	238.00	
F-7	0	0.00	64	35.00	24,116	178.20	213.20	263.90
F-12	0	0.00	60	28.00	46,340	286.60	314.60	

It should be noted that although turtles were stocked in the two experimental ponds at a rate of 100 per acre, only 52 and 80 percent, respectively were recovered. It was thought that several of the turtles may have died; however, the bottoms of the ponds were thoroughly inspected and no turtle shells were found. Therefore, the missing turtles apparently managed to climb over the board fences as was evidenced by the fact that one of the marked turtles was caught in a fish basket in a pond approximately 2 miles from the experimental pond where it was stocked.

The slider turtles used in this investigation grew at an extremely slow rate, if at all (Table II). In fact, over 50 percent of the recovered turtles actually lost weight. This indicates that the turtle populations in the experimental ponds

were higher than those which would normally be found in farm ponds. Consequently, if slider turtles decrease the yield of fish in farm ponds, they certainly should have done so when present at a rate of 50 or more per acre.

Although the stomachs from 91 trapped slider turtles were examined, only 58 contained food. Each food item was estimated and recorded on a percentage basis by volume. The averages and percentages of turtles utilizing the different food items are listed in Table III. Approximately 80 percent of the food items was made of vegetable materials, while only 20 percent consisted of animal materials. Also, about 3 percent of the food consisted of fish or fish remains.

TABLE II

GROWTH OF MARKED SLIDER TURTLES IN EXPERIMENTAL PONDS DURING A 10-MONTH PERIOD

Sex	Measurement in Millimeters				Weight in Pounds		
	Carapace*		Plastron†				
	January	October	January	October	January	October	Change in Wt.
M	135	135	120	121	0.81	0.75	—0.06
M	137	139	121	121	0.75	0.70	—0.05
M	151	152	135	137	1.06	1.07	0.01
M	156	159	141	142	1.19	1.23	0.04
M	146	149	135	137	1.00	0.97	—0.03
M	140	141	125	125	0.81	0.84	0.03
M	161	163	143	145	1.31	1.30	—0.01
M	104	108	95	100	0.38	0.41	0.03
M	115	117	106	109	0.50	0.48	—0.02
M	144	145	129	129	0.94	0.90	—0.04
M	154	159	142	145	1.12	1.13	0.01
M	145	147	132	134	0.94	0.93	—0.01
M	135	139	122	125	0.81	0.80	—0.01
M	148	150	133	137	0.94	1.04	0.10
M	147	149	132	136	1.06	1.00	—0.04
M	125	127	110	111	0.50	0.54	0.04
M	145	150	130	130	0.94	0.95	0.01
F	184	188	168	170	2.00	1.90	—0.10
F	196	200	181	183	2.19	2.17	—0.02
F	180	183	169	170	1.75	1.80	—0.05
F	156	160	144	144	1.19	1.28	—0.09
F	138	144	127	131	0.81	0.86	0.05
F	127	133	117	123	0.75	0.75	0.00
F	151	154	138	141	1.06	0.97	—0.08
F	188	192	171	174	2.12	2.11	—0.01
F	161	169	148	154	1.25	1.39	0.14
F	130	135	121	125	0.69	0.75	0.06

* Maximum length of carapace.
† Maximum length of plastron.

TABLE III

SUMMARY OF DATA FROM ANALYSES OF THE CONTENTS OF STOMACHS FROM 58 SLIDER TURTLES

Food Material			*Average Composition by Volume (percent)*	*% of Turtles Utilizing Different Food Items*
Plant matter	Aquatic plants	Filamentous algae	45.0	58.6
		Najas	9.3	15.5
		Parrot's-feather	3.4	5.2
		Needlerush	0.9	3.4
		Elodea	3.5	5.2
	Terrestrial plants	Grass	0.4	3.4
		Muscadines	17.0	20.7
		Unidentified plants	1.7	3.4
Animal matter	Aquatic animals	Fish remains	2.7	10.3
		Frog remains	0.5	1.7
		Dragonfly nymphs	0.2	3.4
		Unidentified animal material	8.4	10.3
		Unidentified bones	6.5	10.3
	Terrestrial animals	Beetles	0.3	3.4
		Crickets	0.1	1.7
		Spiders	0.1	1.7

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