

NOTES AND FIELD REPORTS

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The Spotted Turtle (*Clemmys guttata*) in Central Florida

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The spotted turtle, *Clemmys guttata*, occurs from the southern Great Lakes region, southeast Canada, and southern New England, along the Atlantic coastal plain south into Georgia and north Florida (Iverson and Etchberger, 1989; Iverson, 1992). In Florida this species is rare and exhibits a patchy distribution (Fig. 1). It appears to exist as a series of isolated populations in the eastern panhandle and northern peninsula (Iverson and Etchberger, 1989; Berry and Meylan, 1992). Museum specimens exist for 13 counties: Alachua, Duval, Hamilton, Lafayette, Marion, Polk, Putnam, Seminole, St. Johns, Suwannee, Taylor, Union, and Wakulla (Table 1, Fig. 2). In addition the species is reported without voucher specimens from the following counties: Baker, Bradford, Clay, Columbia, Dixie, Flagler, Gilchrist, Jefferson, Lake, Leon, Levy, Madison, Nassau, and Volusia (Florida Natural Areas Inventory, 1990). Although the occurrence of *C. guttata* is confirmed for north Florida (Berry and Gidden, 1974; Berry, 1978; Banicki, 1981; Vliet, 1983; Berry and Meylan, 1992), the southern and easternmost limits of the range of this species in Florida (Polk and Seminole counties) remain in question. The purpose of this report is to review recent evidence for the natural occurrence of the spotted turtle in central Florida.

The first record of spotted turtles from Florida was from the north central part of the state at Lake Weir in southern Marion County (Carr, 1940; Fig. 3). Only one of these specimens was collected (USNM 52394). Neill (1954) reported this species from Winter Haven, Polk County, but no voucher for this record exists. However, a specimen donated to the Field Museum by Ross Allen that was collected in Polk County "near Auburndale" (FMNH 46250) may be the source of Neill's report.

More recently three specimens were observed by Don Daleske in the central portion of the Green Swamp in Polk County north of highway I-4. One was captured and released, one was an old, badly damaged roadkill and was discarded, and the third, also a roadkill, was deposited in the Florida Museum of History (UF 66605) (Iverson and Etchberger, 1989; Berry and Meylan, 1992). This specimen, an adult male, was collected during a "cold, heavy rain."

Unfortunately, the date of collection was not recorded. These specimens indicate that spotted turtles probably occur in central Florida. New records which have come to light in the past few years now enable us to present additional evidence for the natural occurrence of spotted turtles in central Florida.

Two roadkill specimens were collected by the senior author in the Green Swamp in Polk County, Florida, during a series of surveys on I-4. Both turtles were found on the south side of the highway within 4.8 km of each other.

A roadkill female (UF 91959) was collected on I-4 at 1130 hrs on 1 August 1994. The fresh condition of the remains suggested that the turtle had been killed within 24 hrs of discovery. For two days prior to the collection of this specimen, weather conditions were characterized by heavy rains and cooler temperatures (22°C low). In fact, although central Florida had been experiencing a prolonged 5-yr drought, near record rainfalls were reported just prior to collection of the specimen. This area received 25.75 cm rain in July 1994, 128% above average (20.22 cm) for the month (Southwest Florida Water Management District, 1994). On 31 July, 7.5 cm of rain was recorded at a point 25 km northwest of the collection locality. Existing data suggest that spotted turtles are most active during cool weather, and if this characteristic is shared by this southern population, the species may be more active during the winter and early spring or during periods of prolonged heavy rainfall.

A roadkill male (UF 96681) was collected on 9 April 1995 at 1230 hrs on I-4. Fresh blood seeping from the mouth and nostril and a lack of rigor mortis indicated that death occurred within a few hours of collection. The weather for four days prior to the find was mostly cloudy with intermittent rains and only occasional breaks in the cloud cover. From 5-8 April approximately 2.5 cm of rain was recorded 25 km to the northwest. These two new records are within 5.0 km of the three specimens (including UF 66605) observed by Daleske.

A live male was collected by Jack Facente on SR 559 near Polk City on 24 February 1996. This specimen was found traveling along the edge of a cypress dome. It is now in captivity at the Central Florida Zoological Park.



Figure 1. Spotted turtle, *Clemmys guttata*, from Seminole Co., Florida. Photo by Barry Mansell.



Figure 2. Vouchered records of *Clemmys guttata* in Florida. Localities in box are records discussed in this report. See Fig. 2 for enlargement of this area. Numbers on map indicate rivers as follows (alphabetically): 1. Alafia, 2. Alapaha, 3. Anacote, 4. Apalachicola, 5. Arbuckle, 6. Aucilla, 7. Big Coldwater Creek and East Fork, 8. Black Creek and South Fork, 9. Blackwater, 10. Chipola, 11. Choctawatchee, 12. Ecofina Creek, 13. Ecofina, 14. Econlockhatchee, 15. Escambia, 16. Estero, 17. Fisheating Creek, 18. Hillsborough, 19. Holmes Creek, 20. Kissimmee, 21. Little Manatee, 22. Loxahatchee, 23. Manatee, 24. Myakka, 25. Nassau, 26. New, 27. Ochlocknee, 28. Oklawaha, 29. Palatamaha, 30. Peace, 31. Perdido, 32. St. Johns, 33. St. Lucie, 34. Santa Fe, 35. St. Marys, 36. St. Marks, 37. Shoal, 38. Sopchoppy, 39. Spruce Creek, 40. Steinhatchee, 41. Suwannee, 42. Tomoka, 43. Turner, 44. Waccassassa, 45. Wacissa, 46. Wakulla, 47. Wekiva, 48. Withlacoochee (Levy, Lake counties), 49. Withlacoochee (Hamilton, Madison counties), 50. Yellow.

Table 1. Records of the spotted turtle (*Clemmys guttata*) in Florida. Acronyms are as follows: AUM = Auburn University Museum, CFZ = Central Florida Zoological Park, CSG = Culver S. Gidden private collection, FMNH = Field Museum of Natural History (Chicago), PM = Paul Moler (pers. comm.), UF = University of Florida, USNM = United States National Museum.

County	Catalogue No.	Year of Collection
Alachua	UF 14447	1962
	UF 29558	1970
	UF 48933	1975
Duval	UF 29559	1964
	AUM 22433	1973
Hamilton	PM s/n	1994
	UF 6603	1954
Lafayette	UF 103500	1996
	USNM 52394	1915
Marion	FMNH 46250	1934
	UF 66605	1984
	UF 91959	1994
	UF 96681	1995
	CFZ live	1996
Polk	UF 39967	1977
	UF 49253	1982
	UF 52600	1982
	UF 66717	1987
Seminole	CFZ live	1991
	UF 96696	1995
St. Johns	UF 52599	1982
	UF 66606	1980
Suwannee	UF 14650	1956
Taylor	FMNH 46251	1946
Union	UF 88491	1992
	UF 66602	1965
Wakulla	CSG351	1967
	UF 66603	1972

All of the new Polk County turtles reported here were found in the Green Swamp within a radius of 5 km. The dominant plant communities are a series of cypress strand systems and bay swamps that extend north to south and form the headwaters of the Withlacoochee River. They are interspersed with north-south ridges which support pine flatwoods and xeric oak communities. Large freshwater marshes occur in association with several lakes (Lake Lowry, Bonnet Lake) ca. 5 km to the south of the highway corridor.

Clemmys guttata also occurs in Seminole County. Since 1985 three specimens have been brought to the attention of personnel at the Central Florida Zoological Park in Lake Monroe (Fig. 2). The earliest record is a live specimen collected in 1985 by Tim Claybaugh on the north side on SR 46, near the I-4 intersection. The specimen was captured and released near the existing Lake Forest subdivision, in habitat described as "mixed hardwood wetland." The forested habitat where this specimen was captured is dominated by water oak (*Quercus nigra*), cabbage palm (*Sabal palmetto*), red maple (*Acer rubrum*), sweet gum (*Liquidambar styraciflua*), and slash pine (*Pinus elliotii*). It now appears to be drier than it was in 1985.

A second specimen was collected live by Henrick Lockhart near the Central Florida Zoological Park grounds on 8 May 1991 and currently remains in captivity at the zoo (Fig. 1). This adult male was captured adjacent to a canal that drains into the St. Johns River. The canal is steep-sided and ca. 10 m wide and 2.4 m deep. A water control structure

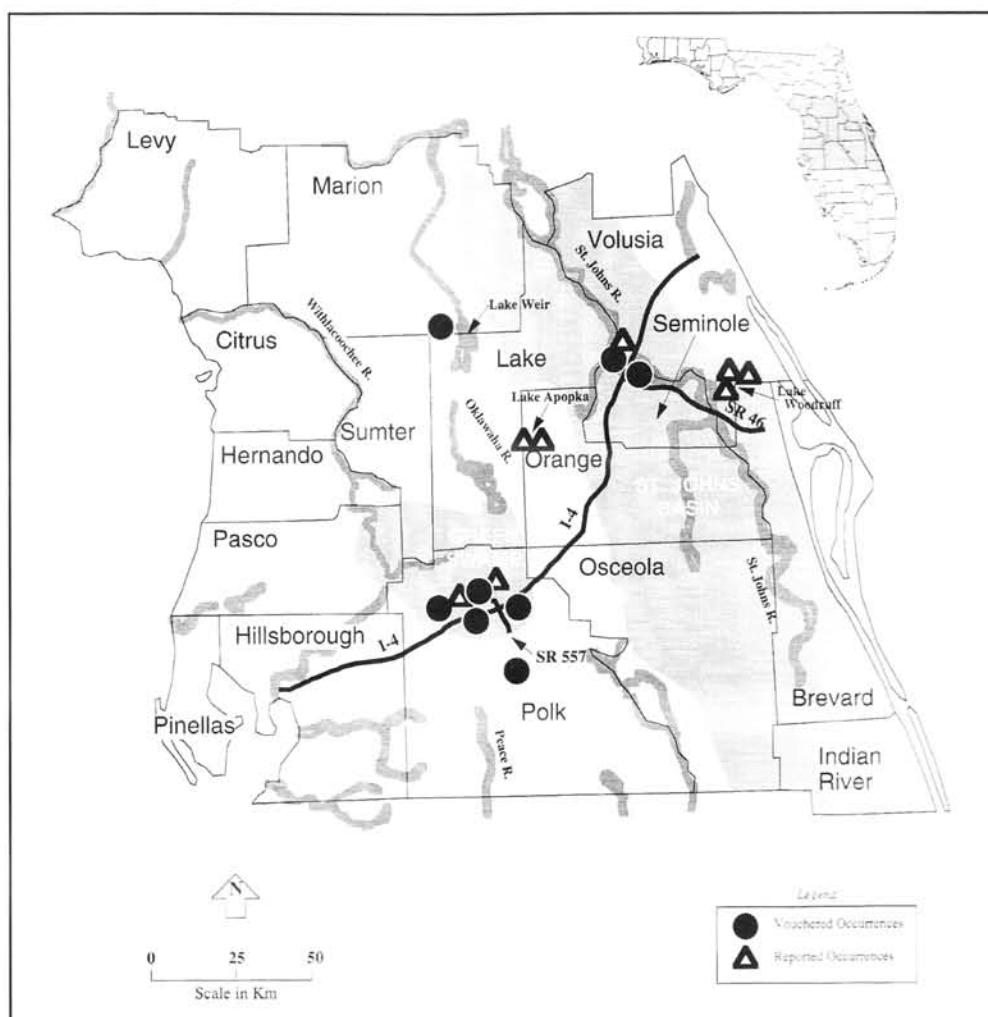


Figure 3. Enlargement of central Florida depicting new records for *Clemmys guttata* in the Green Swamp and St. Johns River basin. The heavy line extending in an east-west direction is the Interstate-4 highway corridor, with significant arteries (State Road 557 and State Road 46) extending to the south. The thick shaded lines are riverine corridors. Vouchered records are ones for which specimens exist in museum collections; reported occurrences are sightings by knowledgeable biologists or specimens that were captured and subsequently released.

maintains water on the north side of the canal until water spills over the structure and drops 1.5 m to the south side. Consequently, water flow rates are much higher to the south of the Orange Boulevard bridge. The dominant vegetation consists primarily of weedy species, including elephant's ear (*Colocasia esculenta*) and primrose willow (*Ludwigia* sp.) at the shoreline and on the canal slopes, with oak species occurring higher on the banks.

A third specimen (UF 96696) was a female collected on Rienhart Road on 9 April 1995 by Fred Antonio. Most of the natural systems in this area have been converted to improved pasture; however, there are some remaining remnants of pine flatwoods interspersed with cabbage palm and a few small sweet bay (*Magnolia virginiana*) pockets. The understory is dense with blackberry (*Rubus* spp.) and low cabbage palms. Scrub vegetation is upslope of this community, and also interspersed within it on high knolls. A 1.6–2.4 ha bay swamp located ca. 0.4 km from the road appears to be the most suitable spotted turtle habitat in the vicinity, with shallow waters, submergent aquatic

vegetation, a sparse canopy, and a drainage which outfalls into the swamp.

In addition to the Polk and Seminole County records, Tim Gross reports additional occurrences from Lake Apopka in Orange County and Lake Woodruff in Volusia County. Three adults were observed in mud flats associated with Lake Woodruff in July 1994. Gross also observed one adult on 28 November 1995 in Lake Apopka in mudflats that were formerly citrus groves. One egg was found in an alligator nest and artificially incubated.

Although a possibility remains that these records from central Florida, and others from northern Florida, represent released captives from elsewhere in the species range, we believe this to be unlikely given repeated captures in several areas over long periods of time (Table 1). We believe that the observations reported here confirm that spotted turtles occur naturally in central Florida, including the Green Swamp in Polk County, and perhaps the entire St. Johns River Basin including Seminole County and possibly into Brevard and Indian River counties.

Spotted turtle populations throughout the state are imperiled because of rapid human population growth and the associated fragmentation and destruction of natural systems. The geographic region known as the Green Swamp, an Area of Critical State Concern, occupies portions of Polk, Lake, Sumter, Citrus, and Hillsborough counties, and encompasses a total of 222,720 ha. Although the Green Swamp is relatively intact, the southern lobe of the swamp is bisected by highway I-4, effectively isolating approximately 2400 ha from the remainder of the system. The Green Swamp forms the headwaters of the Withlacoochee River, and also contributes flow to the Oklawaha, the Little Withlacoochee, and the Hillsborough rivers. Historic soil surveys of Polk County (Soil Conservation Service, 1927) suggest that the Green Swamp may also have been a significant source for the Peace River, although phosphate mining, channelization and drainage, and major road construction (I-4) may have drastically altered historic flow patterns. However, connectivity between the Green Swamp and the Withlacoochee River remains intact, especially on the east side of the swamp, where drainage patterns more closely resemble historic ones. Heavy logging, agricultural activities, and development persist, threatening the ecological integrity of the Green Swamp system. In addition, culverts extending under Deen Still Road and CR 474 are not maintained frequently enough, and these drainage passages are often cluttered with trash. The nutrient-laden waters support dense populations of water hyacinths (*Eichhornia crassipes*) and primrose willow.

Spotted turtles apparently occur along most of the length of the St. Johns River, which flows north approximately 480 km from its source in St. Lucie and Indian River counties to its outflow into the Atlantic Ocean near Jacksonville. There are unconfirmed records from the Florida Natural Areas Inventory for Clay, Flagler, Lake, and Volusia counties, and voucher specimens exist for Duval, St. Johns, Putnam, and Seminole counties. Physiographically, the river resembles a chain of lakes connected by narrow channels. Many diverse natural systems occur along its length, including pine flatwoods, scrub, long-leaf pine sandhills, marshes, and hardwood swamps. It is the longest river in Florida and also slow-moving, with a total gradient change from source to mouth of less than 9 m. Due to its low velocity, flushing of pollutants from the river is restricted. Extensive agricultural activities in the upstream portion of the river have resulted in nutrient loading, while industrial operations near the mouth contribute food-processing by-products, heavy metals, biocides, oils, and other toxins (Jue, 1989). Urban sprawl from the Orlando metropolitan center and Walt Disney World has expanded into Orange, Seminole, and Lake counties, impacting wetlands, fragmenting habitat, and further degrading water quality.

The spotted turtle is listed by the State of Florida's Commission on Rare and Endangered Species as rare. However, this classification does not entitle the species to any legal protection. A recent gap analysis study performed by

the Florida Game and Freshwater Fish Commission proposed two important core areas for the spotted turtle (Cox et al., 1994): St. Marks National Wildlife Refuge and portions of northwest Putnam County. Findings reported in this paper suggest that the Green Swamp and St Johns River Basin are also significant core habitats for spotted turtles in Florida.

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