

Freshwater Turtles Guild

Yellow-bellied Turtle *Trachemys scripta*
River Cooter *Pseudemys concinna*
Florida Cooter *Pseudemys floridana*
Chicken Turtle *Deirochelys reticularia*
Florida Softshell Turtle *Apalone ferox*
Spiny Softshell Turtle *Apalone spinifera*
Common Snapping Turtle *Chelydra serpentina*
Painted Turtle *Chrysemys picta picta*

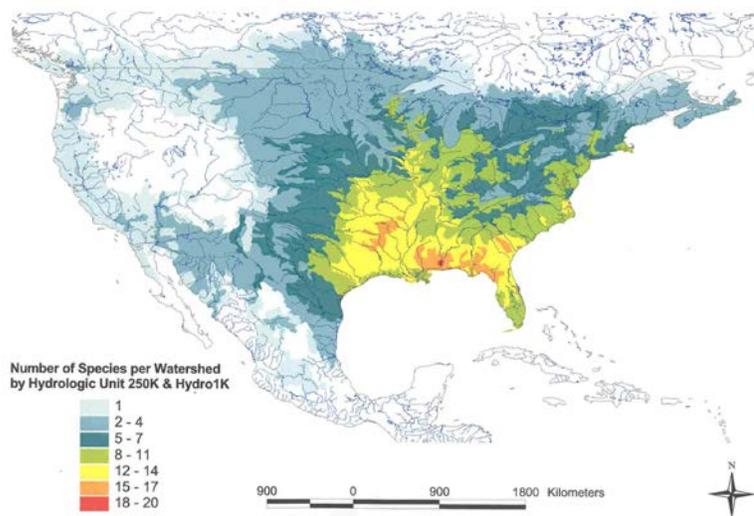
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GENERAL TURTLE DIVERSITY INTRODUCTION

The Southeastern United States includes one of the world's richest regions for freshwater turtle diversity. Freshwater turtles are under increasing levels of threat around the world. In particular, two-thirds of the world's turtle species are listed as threatened by the IUCN, and many of the remaining third have not been evaluated (Turtle Conservation Fund 2002). Human exploitation of turtles has resulted in population declines, local extirpations, and even extinction of some species (Thorbjarnarson et al. 2000).

Species Richness for Turtles of North America



DESCRIPTION

Taxonomy and Basic Description

This group comprises a number of freshwater turtles that may be affected by commercial harvest in South Carolina. These species all occur in freshwater habitat in this state and are susceptible to harvest by some form of trapping. Recently, the demand for freshwater turtles from the US has increased dramatically due to the Asian animal markets.



The yellow-bellied turtle, river cooter, Florida cooter, chicken turtle, and Eastern Painted Turtle are members of the family Emydidae, the semi-aquatic pond turtles (Ernst and Barbour 1989). These species all have hardened carapace (top) and plastron (bottom) shells.



The yellow-bellied turtle is large, reaching lengths from 12.5 to 20.3 cm (4.9 to 7.9 in.). The maximum length for the yellow-bellied turtle is approximately 29 cm (11.4 in.). Adults are sexually dimorphic; females reach greater lengths and overall body size than males (Ernst and Barbour 1998). Adults are typically dark with vertical yellow markings on their carapace. The most conspicuous marking is the yellow blotch on the side of the head just behind the eye (Conant and Collins 1991; Martof et al. 1980). The plastron of these turtles is yellow with round, dark markings along its edge. Older adult yellow-bellied turtles can become very dark, obscuring many of their distinguishing marks.

The river cooter and Florida cooter are both large turtles that can reach lengths between 23 and 33 cm (9 to 13 in.); maximum length for these turtles is approximately 39 cm (15.3 in.). Adults of both species have dark carapaces with yellow markings; however, markings on the Florida cooter tend to be vertical stripes while the river cooter has a net-like pattern. The plastron of the Florida cooter is typically plain yellow (Conant and Collins 1991; Martof et al. 1980). The river cooter has dark markings on its plastron. Both cooters have yellow stripes along the sides of their heads. These species are closely related and some taxonomists believe they might actually be the same species (Seidel 1994). They are typically found in different habitat types, but some overlap does occur and they may hybridize readily in these areas, producing individuals that share traits of both species.



The chicken turtle is small to moderate in size. This turtle reaches lengths from 10 to 15 cm (3.9 to 5.9 in.); maximum length is approximately 25 cm (9.8 in.). This species has a dark black to brown carapace with a light, net-like pattern and a very long, striped neck (Conant and Collins 1991; Martof et al. 1980). The plastron is typically plain yellow, and patterning on the bridge varies among individuals. The bridge may have a black bar, one or two spots, or no markings at all. Very strong, vertical striping is present on the rear legs. The carapace is longer than it is wide and is widest toward the rear, appearing somewhat pear-shaped from above. The edges of all marginal scutes are smooth. The

species differs from most other North American turtles because it has both a fall and spring nesting season as well as a long incubation period.



The Eastern painted turtle is a medium-sized turtle, typically ranging in adult size from 11.5-15.2 cm (4.5-6 in.) (Conant and Collins 1991). The record size for an adult is 19.5 cm or just over 7 in. The large scutes of the extremely smooth carapace are arranged in straight lines across the back, making it unique in that regard (Conant and Collins 1991). Eastern painted turtles are brightly marked with red on the marginal scutes, a yellow plastron, and red stripes on the head and neck. The adults are sexually dimorphic with males exhibiting very long nails on the front feet and thicker tails (Conant and Collins 1991). This turtle is found most often in shallow waters in the Piedmont of South Carolina.



The Florida softshell turtle and the spiny softshell turtle are both members of the Family Trionychidae (Ernst and Barbour 1989). Members of this family are semi-aquatic and have cartilaginous shells rather than hardened shells like other turtles and tortoises. The cartilaginous "shell" of these turtles covers a bony shell in much the same way the scutes of other turtles and tortoises cover a bony shell. Softshell turtles, in general, have very flattened, pancake-like shells.

The Florida softshell turtle is a large species, reaching lengths between 28 and 62 cm (11 to 24 in.); females are significantly larger than males (Conant and Collins 1991; Martof et al. 1980). The shell of this species is typically dark brown to dark green and generally uniform in color. The Florida softshell has an oval-shaped shell with numerous bumps on the carapace just behind the head and neck.



The spiny softshell turtle is also a large species, reaching lengths between 18 and 45 cm (7 to 17.7 in.) (Conant and Collins 1991; Martof et al. 1980). Females of this species are significantly larger than males. The spiny softshell turtle has a more rounded shell than the Florida softshell, and there are usually two or more dark, broken lines that parallel the curve of the shell at its rear. The carapace of this species also has numerous small blotches or circular marks. The spiny softshell has two stripes along its

neck. Both species have extremely long necks and elongated nostrils.

The common snapping turtle is a member of the Family Chelydridae which includes the snapping and alligator snapping turtles. Members of this family are semi-aquatic and are only found in North America. The common snapping turtle is large, reaching lengths of 20 to 36 cm (7.8 to 14 in.). The maximum length for this species is approximately 50 cm (19.6 in.) (Conant and Collins 1991; Martof et al. 1980). This species has a "prehistoric" appearance because its long tail looks "saw-toothed" and its dark brown carapace has a jagged red edge. The plastron of this species is greatly reduced and white. The head of the common snapping turtle is very large and includes a sharp beak-like snout. This species has a nasty disposition and lives up to its name.



Status

None of these species are currently listed either federally or in South Carolina. All of these species were listed as Species in Need of Management in South Carolina, due to a concern over unregulated harvest, from June 2003 until December 2003 under an emergency regulation issued by SCDNR. The Florida softshell turtle is included in this Plan because it is peripheral to South Carolina and is currently ranked unknown (S?) in this state (NatureServe 2013).

Each of these turtles is currently relatively common to abundant in South Carolina. However, they are under potential impact from an unregulated harvest. Although South Carolina does not track turtle harvest through a permit system, North Carolina did some turtle harvest tracking. In 2003, the North Carolina Department of Environment and Natural Resources (NCDENR) prohibited the commercial harvest of freshwater turtles because that state had experienced a tremendous increase in turtle harvest from 2000 to 2003.

There is concern among resource managers and scientists that freshwater turtle populations cannot withstand the level of harvest to which they have been subjected to in South Carolina. Many of the "target" species are long-lived animals that may not reach sexual maturity until they are 15 years old. Further, these turtles exhibit low survivorship in both the egg and juvenile life stages. It could be possible for one trapper to completely eliminate a population of turtles at a given site within a matter of months.

Turtle Life Histories

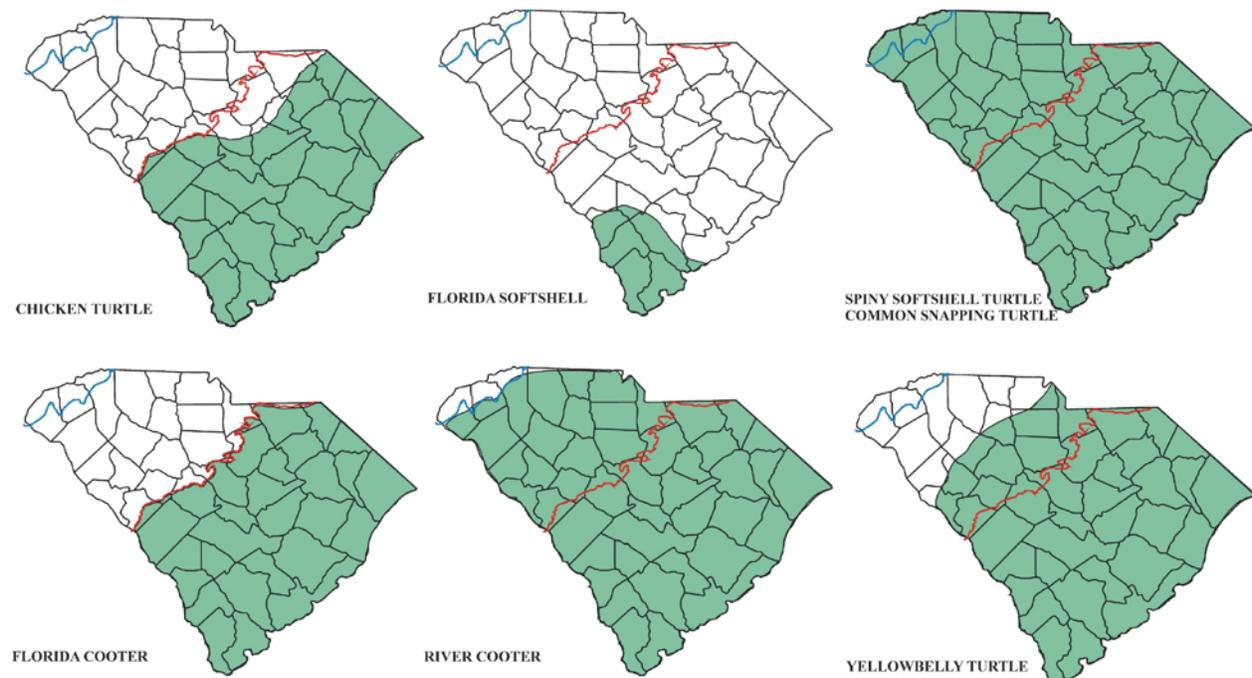
Endangerment of many tortoise and freshwater turtles worldwide is directly related to their life history strategies. Turtles are long-lived organisms that can take years to mature; in some species, sexual maturity is not reached until 20 years of age. Turtle life history traits sharply

contrast with those of North American wildlife game species. Rabbits, squirrels, and white-tailed deer can reproduce at 6 to 12 months of age and may only live to be 2 or 3 years old. Even earlier maturing turtle species become reproductive later than do many shorter-lived birds and mammals: diamondback terrapins (*Malaclemys terrapin*) mature at age 6 (Lovich and Gibbons 1990), Florida cooters (*Pseudemys floridana*) at age 6 to 7 (Gibbons and Coker 1977), yellow-bellied turtle (*T. scripta*) females at age 8 (Gibbons et al. 1981), and chicken turtles (*Deirochelys reticularia*) at 5 to 6 years of age (Buhlmann 1998). Thus, turtles grow slowly, mature later in life, and survive for many years. Consequently, management strategies for turtles should be very different from historical wildlife management approaches for most game species.

When turtles reach sexual maturity, they have a low annual fecundity. In general, few hatchling turtles survive; those that do must harvest resources, grow, and survive for years before they become adults. Thus, adult turtles must have high annual survivorship to maintain stable populations (Congdon et al. 1993, 1994). In some species, older females have higher survivorship and produce more offspring than do younger individuals (Gibbons 1990). Many animals eat turtle eggs, hatchlings, and juveniles, but adults of many turtle species have few natural enemies except humans (Gibbons 1990). Commercial harvests remove large numbers of adult turtles which are the most important individuals for population stability and persistence.

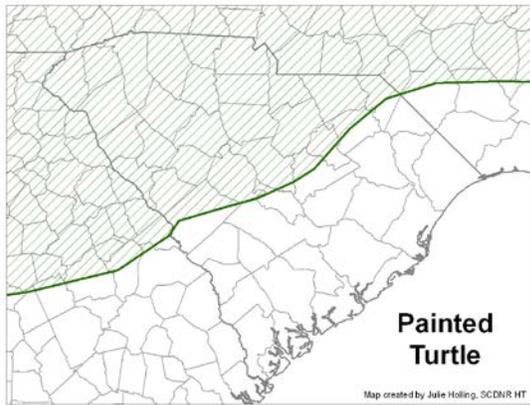
POPULATION SIZE AND DISTRIBUTION

Accurate population estimates do not exist for any of these species. Most, if not all, are considered relatively common to abundant in South Carolina. The Florida softshell is the least common species encountered in this state, primarily due to its restricted range. However, this species is common to abundant in Georgia and Florida.



GENERALIZED RANGE MAPS FOR FRESHWATER TURTLES

ADAPTED FROM CONANT AND COLLINS 1991

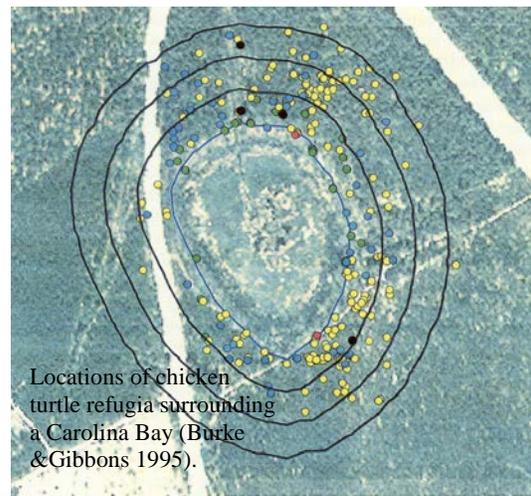


HABITAT AND NATURAL COMMUNITY REQUIREMENTS

All of the members of this group inhabit some type of freshwater and/or wetland system in South Carolina. Some species, such as the spiny softshell turtle and the river cooter, are restricted to reservoirs resulting from impounded rivers as well as the rivers themselves. The yellow-bellied turtle, Florida cooter, and Eastern painted turtle are most commonly associated with ponds, small lakes, and other non-flowing wetlands. The

chicken turtle inhabits seasonally fluctuating, fish-free isolated wetlands. The Florida softshell turtle and the common snapping turtle occur in rivers, ponds, lakes, and other wetland types.

Chicken turtles also use surrounding upland habitats for refugia during periods when wetlands are dry (Buhlmann 1998). These turtles, predominantly juveniles and males but also several females, can spend September through March wintering 50 to 250 m (164 to 820 ft.) from a Carolina bay in South Carolina (Buhlmann and Gibbons 2001). Most often, chicken turtles chose an older live oak-pine forest for wintering habitat; fewer choose clearcut areas. Even the most stringent wetland protection laws do not protect more than 30 m (100 ft.) of adjacent uplands (Burke and Gibbons 1995).



In contrast to the Florida softshell, spiny softshell turtles live in riverine habitats where they often bask on sandbars and bury in clean sand in river bottoms.

CHALLENGES

The primary challenge facing these species comes from unregulated harvest. Many turtle ecologists are doubtful that these species can sustain any type of harvest because of their particular life histories. Continuing unregulated harvest in South Carolina could result in drastic population declines for these turtles, which are currently common to abundant.

Alterations to freshwater habitats can result in impacts to all of these species but especially chicken turtles. These alterations include draining and filling isolated wetlands. Water quality degradation in these wetlands can also adversely affect these turtles. Chicken turtle populations appear most robust where clusters of seasonal wetlands exist in close proximity in an unfragmented landscape. Roads that pass near seasonal wetlands contribute to chicken turtle population declines through automobile mortality; this mortality results when chicken turtles are

moving to upland forests during the dry period. Timber and logging companies that continue to clear-cut forests to edges of wetlands eliminate the dry season habitat required by chicken turtles. Narrow buffers of forest habitat left to protect water quality are currently insufficient to provide the upland habitat component needed by chicken turtles.

The loss of wetlands has likely reduced suitable habitat for Florida cooters. Mortality also occurs as roads and highways further fragment and isolate wetland habitats.

Population stability of yellow-bellied turtles is threatened by hybridization with red-eared sliders (*Trachemys scripta elegans*), a related subspecies from the Mississippi Valley. Red-eared sliders were sold in South Carolina pet stores for many years and continue to be sold through other venues such as flea markets and exotic animal trade shows. This non-native species is often released in South Carolina by well-meaning, but ill-informed people and can survive in our state. The primary issue here is one of genetic integrity as established red-eared sliders interbreed with yellow-bellied turtles, shifting the genetics of these local populations.

Florida softshell and spiny softshell turtles are often captured incidentally on hook and line and are either killed to retrieve the tackle, or later die due to complications from the ingested hook. Road mortality may be a factor as Florida softshells frequently move overland between lakes and wetlands.

Pollution of rivers and streams may adversely affect spiny softshell turtles at greater rates relative to hard-shelled turtles due to the permeability of the skin and shell. Sandbars used for nesting are also favorite sites for recreational boaters and campers during the summer months. Whether the human use of the sandbars directly and significantly affects nesting and hatching success is unknown; however, raccoon predation likely increases where camping refuse is also found. Fire ants have been observed to colonize river sandbar habitats and likely affect hatchling survival (Buhlmann and Coffman 2001).

Alteration of rivers, through damming and dredging, adversely affects river fauna. Dams increase normal summer low flows and thus scour aquatic weed beds (Petts 1984); these abnormal flows may affect hatchling survival. Bottom-release dams reduce river water temperatures and may adversely affect river cooters. Reservoirs may also allow for hybridization between river cooters and Florida cooters as their habitats coincide.

Establishment of nonnative fire ants in the Southeastern US has had an adverse impact on freshwater turtles as they will predate nests and newly hatched turtles. These ants especially affect those species in which the hatchlings exhibit delayed emergence and have evolved to remain in the nest because it provided a safe refuge.

CONSERVATION ACCOMPLISHMENTS

In 2008 South Carolina enacted a law to regulate the export of these species of turtle but also included the Eastern box turtle. Under this new law, exports of these species from the State are greatly limited, making it not cost-effective to trap and export these species of turtles from the State. There is a provision under the law for private pond owners to obtain a permit to trap and

export yellow-bellied turtles and common snapping turtles, but to date, SCDNR has not had any applicants for this permit.

CONSERVATION RECOMMENDATIONS

- Include the importance of protecting all freshwater turtles and their habitat in general in education materials.
- Consider habitat needs of freshwater turtles in river dredging and dam construction projects.
- Determine locations of viable river cooter populations. Surveys can be conducted via basking surveys during the spring and early summer months. These surveys can form the baseline for long-term monitoring.
- Conduct research that determines effects of dams and reservoirs on the exclusively riverine river cooter.
- Conduct research to determine the ecological habitat niche overlap between Florida cooters and river cooters.
- Conduct research on the sustainability of harvest for all freshwater turtles.
- Consider habitat needs of the Florida cooter when managing Carolina bays and floodplain ecosystems.
- Determine locations of viable Florida cooter populations.
- Include chicken turtles in protection plans for Coastal Plain wetlands. Engage the Savannah River Site, US Forest Service, and the Savannah River Ecology Lab in the management of metapopulations of chicken turtles and habitat connectivity between Carolina bay wetlands.
- Consider chicken turtle habitat needs when managing Carolina bays and similar wetland ecosystems. Work with SREL and USFS to develop ecologically meaningful buffers and define core upland habitat needs for Carolina bay habitats required by this species.
- Determine locations of viable chicken turtle populations and monitor those populations. Priority survey sites should be located in the vicinity of Carolina bay clusters.
- Assess the probable impacts of fire ants on freshwater turtles, particularly on chicken turtles, which spend a greater amount of time in the ground as developing eggs, overwintering hatchlings, and terrestrially aestivating adults.
- Complete ongoing life-history studies for the chicken turtle.
- Survey for Florida softshell turtles, and identify possible sites for protection based on results of surveys. Consider spiny softshell turtle habitat needs in river dredging and dam construction projects.
- Monitor known spiny softshell turtle sites for water quality changes, and determine whether changes in water quality adversely affect this species.
- Monitor changes in the demand for turtles and turtle products and the effectiveness of the new law.

MEASURES OF SUCCESS

As results from current research and surveys or future efforts are identified and analyzed, projects will be initiated to address specific needs that arise from these results. Data from surveys

and other research will be used to determine the best means of conserving these species in South Carolina through both habitat management and regulatory means. Stable or increasing populations of these species on public lands and in public waters will be a measure of success.

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