The
Endangered
and
Threatened
Turtles
of
Illinois

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Armored creatures known as turtles arrived on the evolutionary scene some 230 million years ago in the Triassic period, just before the dinosaur era, when mammals began scurrying about the rainforest floor. Ancestral turtles differed slightly from their modern day descendants by having teeth, and by lacking the ability to withdraw their heads into their shells. Soon, evolution and natural pressures split this diverse group into two surviving lineages; those that could retract their heads (hidden-necks) and those that folded their necks to the side (side-necks). Side-necks are restricted to Australia, Africa, and South America, whereas the hidden-necks occur on all continents except Antarctica.

Currently the turtle lineage comprises approximately 250 species grouped into 11 or 12 families. The most wide-spread and familiar are the pond turtles (emydids), which can be found on all continents except Antarctica and Australia. The North American turtle fauna is fairly diverse, numbering 45+ species, with Illinois having 17 species in four families, including softshells (2), snapping turtles (2), mud turtles (3), and pond turtles (10).

Turtles are survivors. They lived through 230 million perilous years, including the comet strike that is believed to have destroyed their great cousins, the dinosaurs. Today they face their greatest challenge in trying to share the world with the super-predator and habitat manipulator, Homo sapiens. Largely due to a profusion of human actions, including pollution, building of dams, draining of wetlands, and various forms of exploitation, most populations of turtles are declining today. In Illinois, four species are of particular concern, being classified as endangered or threatened by the Illinois Endangered Species Protection Board. These species are the river cooter, spotted turtle, Illinois mud turtle, and alligator snapping turtle. In this account we discuss the status, state-history, ecology, and conservation of these rare and little known Illinois species.

River Cooter, Pseudemys concinna (Endangered)

The river cooter is probably the most enigmatic member of Illinois' turtle fauna. This large aquatic emydid (females attain lengths over 1.5 ft) is most often confused with the red-eared slider; however, cooters lack the characteristic red stripe behind the eyes and spots on the belly (plastral) scales (scutes). The cooter's shell is elaborately adorned with concentric swirling lines and reticulate designs of green, yellow, and black. Hatchlings are even more brilliantly patterned than adults.

The cooter reaches its greatest densities in the southeastern United States, but also occurs as far north as Illinois and Virginia, and as far west as Nebraska and Texas. Predominantly riverine and preferring slow currents and pools with aquatic vegetation, river cooters are inhabitants of floodplain lakes, oxbows and sloughs of the Mississippi, Ohio, and Wabash rivers bordering Illinois. Numerous reports of the cooter's presence in southern Illinois followed its original documentation in the state in the 1890's, and by 1991 they had been reported in nine southern Illinois counties (Alexander, Gallatin, Hardin, Jackson, Jersey, Massac, Randolph, Union and White). Until a status survey in 1991 confirmed the cooter's continued existence in floodplain lakes in White and Gallatin counties, the species was feared extirpated in Illinois. In his 1937 book, Turtles of Illinois, Alvin Cahn reported that the cooter's habits were poorly known and it could be studied only over extended periods. Phillip W. Smith, one of Illinois' foremost herpetologists, followed in
1961 by reporting the turtle as "very rare" and suggested it was restricted to large rivers and adjacent lakes only in extreme southern Illinois.

Like most turtle species, cooters bask during the day to regulate their body temperatures, diving into the water at the slightest disturbance. Adults feed on aquatic vascular plants and algae, whereas juveniles occasionally consume aquatic invertebrates. In late May or June, sometimes continuing through late summer, females venture onto land risking predation in search of suitable nesting sites. When a nesting site is found the female digs a flask-shaped nest and deposits 9 to 29 leathery elliptical eggs. Little information is available for the cooter's nesting habits in Illinois; the only known nest contained 14 eggs. Hatchlings emerge from the nests in August or September and hasten to water before they starve or are eaten. Once in the safety of the water, they must remain hidden from predators like wading birds, or become a tasty hors d'oeuvre. When the turtles reach larger sizes, predation pressures subside and they can live over 40 years.

The river cooter's rarity may be due, in part, to habitat alteration. In Illinois, destruction of many floodplain lakes and swamps can be attributed to draining, levees, and cultivation. The main conservation thrust should be to preserve the species' habitat and further assess the Gallatin County populations, thought to be the largest in the state, to quantify crucial ecological information like reproductive success and habitat utilization, so management strategies can be adopted for the species' recovery. Surveys need to be conducted on habitats adjoining the Mississippi, Ohio, and Wabash rivers to locate additional populations.

**Spotted Turtle, Clemmys guttata (Endangered)**

One of the state's most attractive species, the relatively small spotted turtle, generally less than 7 inches, is vividly patterned with small yellow or orange spots on a contrasting black background. The males have drab brown eyes and chins, relatively thick tails, and a concave plastron, an adaptation of male semi-aquatic and terrestrial turtles that aids in mating. Contrastingly, females have bright orange chins and eyes, thinner tails, and a flattened plastron.

This turtle is widely, but disjunctively distributed from southeastern Canada to central Florida, and from the Atlantic coast west to northeastern Illinois. Historically, its Illinois range probably included much of the Chicago metropolitan area; unfortunately, no individuals have been discovered in Cook County since the early 1950s. For more than a quarter of a century thereafter, the spotted turtle was considered extirpated in Illinois. In the early 1980s however, three populations were discovered in Will County along the Des Plaines River. One is currently in jeopardy due to industrial expansion but the remaining two are protected within Illinois Nature Preserves.

Throughout their range, spotted turtles inhabit marshes, fens, and sedge meadows. These turtles are extremely tolerant of cool temperatures and may emerge from hibernation as early as February. Courtship and mating begin in the early spring, March to May, and females lay three to five eggs in late June. By July, the extreme heat of summer forces the turtles to enter a period of dormancy (aestivation), and it is not until the cool autumn arrives that they emerge and possibly feed on aquatic invertebrates for a short period before hibernation. Activity winds down about late October, and in early November they return to hibernation sites, often in
SPOTTED TURTLE

Deeper waters near muskrat lodges. Spotted turtles have relatively small home ranges, averaging 1.36 ha, but courting males and nest-seeking females are capable of moving distances in excess of 300 meters. The most important predators of eggs and juveniles are mammals, predominantly raccoons. Adult mortality is generally low, but adults with missing limbs and stub-tails, are not uncommon. Spotted turtles with numerous scars are frequently encountered but they appear to survive with this damage. On one occasion, a female with a single functional leg was observed digging a nest and laying three eggs.

Estimates are that approximately 200 individuals currently survive in the state, but exact numbers are unknown. In Illinois, the spotted turtle's cattail marsh and sedge meadow habitats are continually threatened by pollution and urban development. Conservation and management of spotted turtles in Illinois depends on the preservation of these wetlands. Because of the current small size and fragmentation of the Illinois population, their genetic diversity and health will require regular monitoring.

Illinois Mud Turtle. Kinosternon flavescens spooneri (Endangered)

Unlike some of our state's endangered species, the Illinois mud turtle lacks the grandeur of a soaring bald eagle, the huggable cuteness of a river otter, or the psychedelic beauty of an Iowa darter. Rather, the decidedly odiferous mud turtle closely resembles an oval dull-brown, five-inch-long rock. This lack of outward charm, however, is compensated by an intriguing life-history and biology. The Illinois mud turtle is identified by two features: a double-hinged plastron, and a triangular ninth marginal scute that is conspicuously higher than the eighth.

Yellow mud turtles inhabit the southwestern United States and northern Mexico; however, there are a series of small, widely scattered populations northward and eastward of this range in Illinois, Iowa, and Missouri. These populations, known as Illinois mud turtles, probably were established during a drier, warmer climatic period between the last glaciation (approximately 11,000 years ago) and the present when the western prairies pushed through the Midwest and into more eastern states. Mud turtles, along with a plethora of other western animals, accompanied the prairie expansion. When conditions became cooler and moister, the prairie withdrew, but small pockets persisted in unusual areas such as the deep sandy soils along the Illinois, Mississippi, and Green rivers. Today, these sand prairies serve as refuges for western animals and plants, including the Illinois mud turtle.

Illinois mud turtles occur only where there is aquatic habitat associated with deep sandy soils. Occasionally, this habitat is a backwater of a river, but more often it is a temporary pond. Peculiarly, the turtle requires ponds to survive but uses them for only a few months of the year, spending most of the year burrowed in sand. In spring, the turtles invade the ponds to gorge on mollusks, tadpoles, insects, and aquatic vegetation. As the ponds dry, the turtles emigrate to sand dunes and burrow. Unlike most turtles, which abandon their eggs buried in flask-shaped nests, Illinois mud turtle females lay clutches of two to five eggs in their burrows, staying with them for up to a fortnight. Parental care is almost unknown among turtles, and only one other species, the Burmese brown tortoise, is known to stay with its eggs for a time after laying. Western hognose snakes eat the eggs and hatchlings.
while raccoons, foxes, and coyotes prey on both adults and eggs.

This turtle owes its endangered status more to habitat destruction than to natural predators. As civilization expanded, humans drained the once extensive prairie marshes, plowed under temporary ponds, and developed huge central pivot irrigation systems, promoting agriculture in sandy soils. As cultivation increased, Illinois mud turtle habitat declined severely, disjoining the Illinois population. Most fragments comprise a few individuals associated with a small prairie pond. Such small populations are highly vulnerable to genetic deterioration, disease, and environmental fluctuations. Only two populations exceeding 50 individuals are known in the state; the immediate concern is protecting critical habitat for these larger populations. Habitat improvement for populations on state-owned land, and translocating individuals from threatened habitats to protected reserves are other actions requiring study.

**Alligator Snapping Turtle, Macrolemys temminckii**  
(Threatened)

Possibly the rarest and most elusive of all Illinois turtles is the mammoth alligator snapping turtle. As the largest freshwater turtle in North America, this species attains lengths nearing 2.5 feet and weights of 250 lbs. Alligator snappers differ from the common snappers by possessing three prominent keels along their backs, massive heads and gapes, pronounced hooked beaks and eyes not visible from above.

An inhabitant of the deep murky waters of large rivers and their tributaries, the species is found in drainages ranging from Georgia and Florida to Texas and as far north as Kansas, Illinois, and southwestern Indiana. Alligator snappers are not restricted to large rivers; they have been reported in habitats ranging from canals, lakes, and oxbows to swamps and bayous. Juvenile alligator snappers may occasionally wander into small streams. In Illinois, the species appears restricted to lower reaches of the Mississippi, Illinois, Ohio, and Wabash rivers, where it has been recorded from 13 counties (Adams, Alexander, Calhoun, Jackson, Jersey, Massac, Mason, Peoria, Randolph, Rock Island, Union, Wabash, and White). Records north of St. Louis are suspect because no commercial fishermen interviewed during a status survey had ever seen a specimen in the wild during their lifetimes. Alligator snappers commonly have been brought from Arkansas and the lower Mississippi River for customer attraction at fish markets and subsequently have been released into northern Illinois.

Decked with ridges, tubercles, and cryptic coloration, the alligator snapper is well adapted for its benthic nature. Females only venture onto land to nest and avoid nesting in open sandbars and low forested areas with leaf litter and matted roots. In Florida, where nesting habits are known, females tend to choose open sand spoil mounds. If an individual survives the high mortality juveniles face, it can live well over 50 years (a captive individual at the Philadelphia Zoo lived over 70 years). Being an ambush predator does not hinder this turtle's appetite; it voraciously consumes fish, crayfish, freshwater mussels, snakes, amphibians, turtles, acorns, briar roots, wild grapes, small mammals, birds, and, where they occur, alligators.

Longevity and rarity (only two Illinois sightings have been published since the 1960s) of this turtle make it extremely vulnerable to population perturbations and there-
fore, extirpation. The difficulty and expense of capturing individuals for study have long hindered population studies that are critical for formulating conservation strategies. Unfortunately, the paucity of demographic data presents great difficulty in attempting to design management strategies for the recovery and assurance of the species' continued persistence in Illinois' waterways. Recent status surveys have indicated that if a viable population exists in Illinois, it is likely to be located in the Mississippi drainage between the Big Muddy and Ohio rivers. Determining whether a genetically stable, self-sustaining population exists is of paramount importance and will elucidate whether the occasional individuals found are members of an Illinois population or transients, immigrants, or introductions from southern states.

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Turtles are generally long-lived animals and have evolved delayed sexual maturity to combat high juvenile mortality; thus, increased adult mortality will lead to significant population declines. Because of this delayed sexual maturity, it can take years, possibly decades, for a population to recover, when mortality in an area is excessive. If periods of high mortality are frequent and severe, as in the harvesting of common snapping turtles, they usually lead to rapid extirpation of populations. Although we view turtles as those armored creatures tough and impervious to all, in fact, they are sensitive to human impact and environmental duress. For humans and turtles to coexist, we need to understand the limits of natural populations and habitats to recovery. Wanton destruction of habitats without regard or knowledge of the effects to resident fauna and flora is all too prevalent in today's society. It is imperative to garner knowledge on the interactions of turtles and identify critical habitats, for only with this information can a species be species.

Selected Readings Covering Illinois Chelonifauna

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