

February 22, 2023

**C-22-14
109R & 131 CLARK LANE
PUBLIC HEARING 01-26-23
EXHIBIT #62**

Dear Conservation Commission

The enclosed are documents 3 major causes of turtle decline in CT supporting the reports Carya Documents already submitted on 01/26/23 and 02/09/23 and in support of oral testimony.

From: Sigrun Gadwa of Carya Ecological Services LLC

identifying box and wood turtles

Eastern Box Turtle *Terrapine c. carolina*

Status: CT *Species of Special Concern*, scattered populations, especially on traprock ridges, in farming districts, along utility rights-of-ways; often associated with large wetland systems.

Size: about 4 to 7 inches long. **Appearance:** distinctive black and yellow, orange, or tan patterns on upper *and* lower shell, sometimes almost black; hinged lower shell (plastron) varies greatly among individuals; upper shell (carapace) is domed & oval; able to completely close shell. **Habitat:** terrestrial — mature & immature woodlands and meadows; cool down in pools and wetlands in summer; hibernates in or near wetlands in winter.

Wood Turtle *Glyptemis insculpta* (*Clemmys insculpta*)

Status: CT *Species of Special Concern*, uncommon, extirpated from many polluted streams. **Size:** 6 to 9 inches long. **Appearance:** elongated oval shape; gray-brown, domed, oval upper shell (carapace) is intricately sculptured/textured; lower shell (plastron) has yellow patterns which look similar on most individuals; red-orange on neck & forelimbs. **Habitat:** Semi-terrestrial; forages on land in summer, on banks in spring and fall; feeds in



wood turtle plastron

The CT DEP lists any non-harvested wildlife species to be *of Special Concern* if it has been scientifically documented 1) to have a naturally restricted range or habitat within the state; 2) to be at a low population level; 3) that its unregulated harvesting would endanger efforts to conserve its population; or 4) has been extirpated from the state.

watercourses and basks on banks in spring and fall; overwinters in rivers and streams, often in groups under root tangles.

3 major causes of turtle decline in CT loss of habitat

Acreage of preferred habitat is shrinking. Eastern box turtles search for food in low-growing vegetation, along woods edges, powerlines, or in old post-agricultural fields. Wood turtles forage in riverside woods and fields during their summer, “on-land” phase, sometimes over 500 feet from the river. Both species are sensitive to dehydration and favor wet meadows and moist thickets; they tend to be active in drier habitats before the day heats up too much. These habitats are lost as undergrowth is cleared & woods and meadows are developed. Quality habitat is also lost as open land matures into forest, though both these turtle species also forage on the forest floor. Succulent plants, mushrooms, beetles, slugs, and worms are favorite foods.

Habitat fragmentation reduces the effective area available to a turtle population when isolated habitat remnants become inaccessible. Small, isolated woodlots cannot sustain populations.

Genetic problems may arise when habitat fragmentation isolates a small turtle population** from other nearby turtle populations. Inbreeding - when turtles who are too closely related mate - and loss of genetic diversity may result in weaker individuals that are more susceptible to disease and predation. Neither same sex populations nor isolated turtles can reproduce!

Stream and wetland degradation reduces aquatic habitat. Wood turtles also feed on aquatic invertebrates and small fish, and hibernate in mostly unpolluted streams, moving considerable distances up and downriver. Box turtles cool down in pools and streams during hot weather, and young box turtles may be semi-aquatic. Box turtles dig burrows in wetlands or under leaves and duff on the forest floor, both to stay cool in hot, dry spells and to hibernate in winter.

Sunny nesting sites with loose soil that is soft enough to dig in, may be scarce in Connecticut landscapes.

Note that habitat for our common, *fully aquatic* turtle species (painted turtles, snappers, and stinkpots) is not in short supply. They can use many urban/suburban ponds and watercourses, because they tolerate moderate levels of water pollution, so long as there is prey available. Painted turtles are able to convert their metabolism to anaerobic respiration during hibernation, and spend the winter buried in low-oxygen, pond-bottom mud. However, *aquatic turtles also suffer road kill* en route to and from nest sites on land.

low reproductive rates

Egg loss and juvenile mortality are high for all turtle species. Turtle eggs and thin-shelled baby turtles are not guarded by their parents, and comprise part of the diets of many predators, such as raccoons, skunks, and foxes. Populations of these predators near human developments have grown. Eggs take a relatively long time to hatch: 5-9 weeks for wood turtles and 10-11 weeks for box turtles. Egg fertility is often low for Eastern box turtles. Suitable sunny nest sites with sandy or loose soil are hard to find.

Eastern box turtles do not reach sexual maturity until they are 20 years old—longer than it takes humans—and wood turtles take 14 years. However, box and wood turtles, with their sturdy shells and good camouflage, can live to be very old. Box turtles in the wild typically live 40 years, and sometimes survive to over 100 years.

rising adult mortality

More turtles become roadkill as more roads are constructed and traffic increases. Slow moving animals, turtles are especially vulnerable to road kill. Most at risk are those species that feed on land at least part of the time, such as box turtles, wood turtles, and spotted turtles. Nesting females are disproportionately run over and killed.

Predation by raccoons and other scavenging predators has increased, because these opportunistic animals thrive within and around human developments.

Turtles are increasingly collected to be pets and displaced from their home territories as sprawl-style development proliferates and recreational hiking becomes more popular. Connecticut has **outlawed** the keeping of wild eastern box, wood, and bog turtles as pets - most pet turtles die of disease or malnutrition. Displaced turtles usually die.

Habitat loss and fragmentation lead to increased mortality. Turtles without sufficient, high quality foraging habitat may become malnourished; turtles inhabiting polluted environments may be more vulnerable to disease & predators. Heavy equipment required in new construction may eliminate entire populations (** In ecological terms, a population is "all members of the same species occupying a specific area at the same time"- <http://www.ksu.edu/biology/courses/303/populations.pdf>)

Only with a low adult death rate and many repeated nesting attempts can enough juvenile turtles survive to maintain a healthy population. This stands in sharp contrast to fast breeding, short-lived species such as rabbits.

help QRWA monitor box and wood turtle populations

Data collection helps the State monitor the status of declining species and helps municipalities identify viable populations and protect their habitats. Attached to this pamphlet is a modified version of the CT DEP's “Special Animal Survey Form” for the Natural Diversity Database (NDDDB). Through ***Turtle Crossing***, a conservation and outreach program funded by the National Fish and Wildlife Foundation, QRWA is developing a snapshot of the turtle populations across central and southern CT. **If you see wood and box turtles, please help us by filling out the report attached below. Cut along the solid line, and send the completed pre-addressed form with observation**

date, photo and location map (if possible) to QRWA. QRWA will forward the data to the CT DEP Natural Diversity Database and to the appropriate Conservation Commission. QRWA may contact you for additional information.

For additional forms, go to www.qrwa.org/programs, and click on turtle report forms for a printable pdf version, or contact the Turtle Crossing Project at turtlecrossingproject@yahoo.com, or the QRWA office at qrwa@rcn.org, or 203 237-2237.

A planned, long-term monitoring program with a wildlife collection permit from CT DEP, such as QRWA's Turtle Crossing Project, allows for tracking individuals and population viability. Contact QRWA if you wish to be trained.

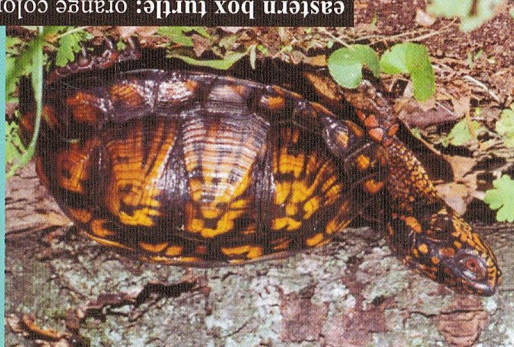
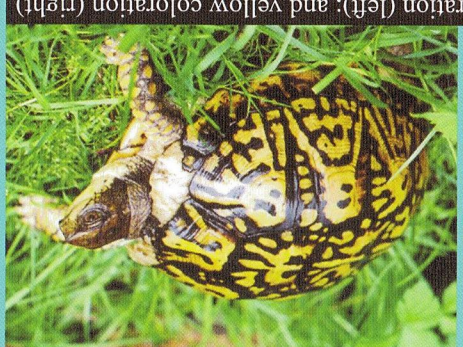
With an organized monitoring program, trained volunteers may collect useful information:

- ➔ **Sex** — females typically have brown eyes and have a flat plastron; males typically have red eyes and have a slightly concave plastron and a longer, thicker tail to assist with mating;
- ➔ **Age** — the number of rings on a scute (plate) approximate a turtle's age in years; **note:** scute rings are often worn off on old turtles, and some very old individuals completely lack scute rings;
- ➔ **Size** — the length and width of the turtle are most accurately measured with large calipers;
- ➔ **Weight** measurements, which can be compared to recorded weights for similar-sized turtles, help in assessing a turtle's condition — habitat loss and degradation and illness can cause weight loss.

References: Dodd, Kenneth, Jr. 2001. North American Box Turtles, a Natural History. University of Oklahoma Press, Norman OK.
Ernst, C.H., J.E. Lovich, and R.W. Barbour. 1994. Turtles of the United States and Canada. Smithsonian Inst. Press, Washington, DC.

June 2004. By Sigrun Gadwa MS, Cheshire, CT, caryaova@juno.com and Tony Ianello, tonyianello@yahoo.com. First edition (2003) by Sigrun Gadwa. Produced by the Quinnipiac River Watershed Association (QRWA) for its *Turtle Crossing* Conservation and Outreach Program, 607 East Main St., Meriden CT 06450, qrwa@rcn.com. Layout and design by Illisa Kelman, illisakelman@yahoo.com. *Turtle Crossing* is funded by National Fish & Wildlife Foundation (NFWF) and the Community Foundation for Greater New Haven. Technical review by herpetologist, Hank Gruner, CT Science Museum, West Hartford, CT. Editorial & production assistance by Illisa Kelman, Mary Mushinsky and Tony Ianello, QRWA. Production support from the NFWF.

Wood turtles and eastern box turtles are listed as "Species of Special Concern" in Connecticut by the Department of Environmental Protection. When too few young turtles mature into breeding adults to balance the adult death rate, local populations "blink out." Remaining populations become fragmented - often consisting of solitary, non-breeding adults. Box turtles and wood turtles are disappearing from many parts of their former range. Spotted turtles are declining, and are listed as species of concern in neighboring states. However, self-sustaining populations of these wetland-associated turtle species can persist in a partially developed landscape, if homeowners and planners are aware of their needs and vulnerabilities. (Cover photos by Tony Ianello)



eastern box turtle: orange coloration (left); and yellow coloration (right)



wood turtle

Connecticut Turtles of Special Concern

turtle conservation tips

Report sightings of eastern box, wood, & spotted turtles to the CTDEP. Use QRWA's monitoring form at the bottom of this pamphlet.

Help turtles cross roads and climb curbs without risking human safety. Always put turtles on the side of the road toward which they are heading, because they will try to cross again if put back from where they came. Box turtles cannot climb vertical curbs. Recommend that construction permits stipulate 60° "Cape Cod" curbs. Consult a wildlife specialist to assess the feasibility of *erecting fencing* along a road where turtles are often killed.

Do not take a turtle from its familiar home range to a new area, even if you think it provides more suitable habitat. A relocated box turtle futilely will attempt to return home.

Keep trash tightly sealed in hard containers with secure lids in order to discourage scavenging predators such as raccoons. Reduced predation can help improve hatching success.

When designing new developments, preserve habitat, minimize fragmentation, and minimize impacts on turtle populations. For subdivision and industrial park designs, cluster buildings in order to include large enough *open space areas* to support box turtle populations and wide enough *river buffers* for summer foraging by wood turtles—most effective if contiguous with other open space areas. *Identify and protect nesting areas.* *Protect water quality* in rivers and streams with generous wetland setbacks and other measures. *Minimize road mortality by installing low fences or stone walls next to parking areas and entry roadways.*

Leave box turtle or wood turtle habitat on part of your property: leaf litter or wood chips instead of lawn, areas with natural groundcover, and open, sandy areas for nesting. Check for turtles before mowing. Plant extra strawberries, raspberries, blackberries, tomatoes or a mulberry tree (favorite foods). Limit use of insecticides, which reduce turtle food supply even if not directly toxic to turtles.

Do not collect turtles as pets. Collecting wild turtles depletes wild populations. However, because Eastern box turtles have a small home territory (3-4 acres) and are long-lived you may become familiar with individuals and see them year after year. Do not release pet turtles into the wild. Pet turtles can spread disease to native turtles.

Request that development sites in areas with known box or wood turtle populations be searched immediately prior to grubbing and grading. Box turtle searches should be done when turtles are active, *not* in winter or in hot summer weather when they may bury themselves under leaf litter or in shallow soil. Use silt fencing to block turtle entry into a construction site. Avoid construction in sites where box or wood turtle are likely to hibernate—wetlands, streams and regulated setbacks—to prevent multiple deaths.

turtlecrossingproject@yahoo.com

Tony Ianello, QRWA volunteer coordinator

other CT turtle species



Common Musk/Stinkpot (*Sternotherus odoratus*). Localized in many ponds; emits an odor when disturbed; small, (about 4 inches) aquatic turtle; dark shell often covered by algae; plastron partially covers underside. Light lines on head. †

Bog Turtle (*Clemmys muhlenburgii*). Endangered & secretive; less than 4 inches long; inhabits non-forested, calcareous wetlands in western Connecticut; domed, dark shell, sometimes with light lines; yellow-orange blotches on sides of head. ‡



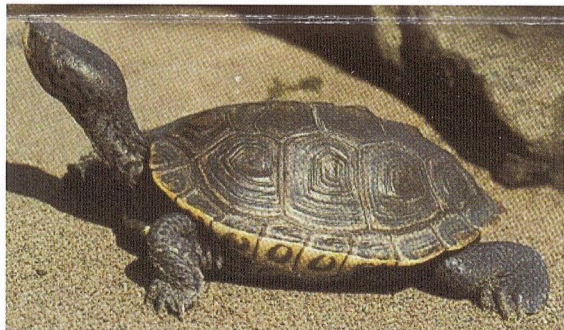
Eastern Painted Turtle (*Chrysemys picta*). Common; shy; 4-6 inches; inhabits ponds and rivers; suns on banks and logs; colorful stripes on neck; round, smooth, black, flattened (not domed) shell. †



Spotted Turtle (*Clemmys guttata*). Declining; 3-5 inches; black, typically with yellow polka dots; requires groups of wetlands, and seen on land and in small ponds and wetlands. †

Diamond-back Terrapin (*Malaclemys terrapin*). Previously very rare due to over-harvesting for food, but is making a comeback in some estuaries; 6-9 inches; greenish-gray, sculptured shell, similar to

wood turtles, but inhabits salt or brackish water, in or near salt marshes. ‡



Photos by
Tony Ianello†,
Michael Klemens‡,
and
Geoff Hammerson ††
as indicated.

Common Snapping Turtle (*Chelydra serpentina*).

Common in ponds, sluggish streams, & marshes; may bite, thus dangerous to handle, even when small; flattened, rough, gray or blackish shell; long tail with saw-tooth projections; up to 1.5 ft wide; large head; plastron incompletely covers underside. ††



monitoring form - how to fill it out and where to send it

Handling eastern box turtles is safe for non-professionals, but wood turtles may scratch, and are best handled by natural resource professionals. Avoid handling and disrupting females during nesting season (mid May to mid July). Supervise children around turtles.

- ➔ Record the date, time of day, and location where turtle is observed; include address and a quick sketch with a north arrow and details such as approximate distance to roads, field edges, ponds. Note if turtle is alive or dead.
- ➔ Take photos *if possible* of the upper and under shell (plastron). Box turtles' markings are unique, like a fingerprint.
- ➔ Record locations of scars, injuries (e.g., missing left forefoot), or notches in edge of shell (used to mark observed individuals).* With turtle right-side up, note which scute (plate) of the shell is marked, moving back from the head, right or left. (For example, R2 is the second scute to the right of the centerline). Do *not* attempt to mark a turtle by notching unless trained by a professional.

tear here to mail