

Spiny Softshell Project Summary for 2022

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Background:

The Eastern Spiny Softshell Turtle (*Apalone spinifera spinifera*) is a medium to large aquatic turtle found in Lake Champlain and the lower reaches of some tributaries with concentrations occurring in Missisquoi Bay and the Lamoille River. Unlike other turtles, the softshell has a leathery, pliant shell. Softshells utilize a variety of habitats to fulfill daily and seasonal requirements: soft bottomed and vegetated aquatic areas for foraging and escape cover; exposed rocks and logs for basking; vegetation-free sandbars and shale pebble beaches that are well-drained and have adequate solar exposure for nesting; and underwater wintering sites (hibernacula) that provide well-oxygenated water and are free of ice scour and disturbance. The Vermont Softshell Turtle population is thought to be about 200-300 individuals (adults and large juveniles, not including hatchlings) and is separated from other populations in the Great Lakes and Mississippi drainage.

Direct loss and degradation of habitat, high predation pressure on eggs and young, and human disturbance threaten the long-term viability of Lake Champlain's softshell population. In 1987, due to their historic decline, their small population size, and continued threats to their survival, the Spiny Softshell Turtle was state listed as threatened in Vermont. In 1991, the Spiny Softshell was nationally listed as threatened in Canada and Québec officially listed it as threatened in 1999. The maintenance of the Lake Champlain Spiny Softshell population is a shared responsibility of Québec and Vermont because the turtle uses both U.S. and Canadian waters, wetlands, and shoreline habitats and are affected by human activities in both countries. Spiny Softshell Turtle conservation efforts have benefited from the involvement of many organizations and international cooperation. The Vermont Eastern Spiny Softshell Turtle Recovery Plan guides recovery activities. It may be found on the Vermont Fish and Wildlife website.

Activities during 2022 were carried out in compliance with the Vermont Endangered and Threatened Species Permit issued to Toni Mikula as a biologist with the Vermont Fish and Wildlife Department. A State Wildlife Grant from the US Fish and Wildlife Service and the Nongame Wildlife Fund supported this work. We greatly appreciate the cooperation of landowners and land managers who allowed staff onto their property and the assistance of volunteers as well as USDA Wildlife Services staff and ECHO Lake Aquarium and Science Center (ECHO) staff. We would also like to acknowledge the relationship that has been forged with the UVM Wildlife and Fisheries Society and Champlain College whose student members assist each year with the annual nesting beach workday.

Results and Discussion:

Management of important communal nesting areas allows us to save many state threatened Spiny Softshell, Map, Snapping, and Painted turtle hatchlings each year. The 2022 softshell nesting season concluded with 236 Spiny Softshell nests examined, 2 laid in 2021. We estimate that 1257 hatchlings emerged or were collected from 88 successful nests. This included some nests that had been disturbed by mammal predators but still produced live young we documented. This is an undercount because some nests depredated in late August

through October may have had hatchlings emerge before the depredation event. Mammals likely detected some nests because hatchlings successfully got out of the nest and to the surface, leaving some substrate disturbance and a scent hole. In 2022, 74 nests were depredated during the emergence period that might have had hatchlings emerge but did not contribute to the estimate of hatchlings. Mammals depredated a total of 157 Spiny Softshell nests during 2022, and 88 nests were successful (56.1%).

Nest depredation remains a challenge at all sites. New this year, an electric fence was reduced to only encircle the nesting substrate of two distinct beaches. Formerly, the electric fence encircled one large communal nesting area, as well as a second 68 inch high fence to deter predators that jump (red fox), and regular monitor with mammal trapping as needed. However, this arrangement left much predator habitat inside the fence, and was also problematic to maintain because such a long electric fence has more places to develop a short and provides more opportunity for predators to find a way in.

We continued to implement successful nest protection techniques, including the use of 1 inch x 2 inch mesh fencing laid directly over nesting areas following nesting (July 5). Shale beaches are more effectively protected by wire mesh than sand beaches because predators find it more difficult to push the shale through the mesh. A string of sand beaches at another important site once again experienced significant mammal depredation (83 of 88 nests; 94.3%), but we documented 11 successful nests at this site (12.5%). One section of sand beach known to be well used in previous years was protected by vertical fencing, elevated wire mesh covering the sand nesting substrate, as well as trapping. Fencing was moved to a larger strip of beach that historically has not been fenced and away from the traditionally fenced beach which received very little use in 2021. The fencing was not effective at deterring predators, which seem to get inside it as often as they like, by unknown means. Nesting females returned to the traditional beach in 2022, likely because higher lake levels in early summer made it easier to reach than it was in 2021.

The nearby island nesting site was likewise exposed. We found 65 nests, only 2 of which appeared to be at least partially successful (3.1%).

During 2022, hatchling emergence was first documented on August 11. We were able to collect 103 live softshell hatchlings that were either released immediately or kept in captivity for future release. Some were hatched but not yet ready to emerge from underground nests, and some were found as viable embryos and eggs. These were cared for at ECHO or by FWD staff until ready for release. The last nest with evidence of emergence was located on October 3. Fifteen Spiny Softshell hatchlings from the 2022 nesting season were given to the ECHO Leahy Center for Lake Champlain for care over the winter and early spring (head starting) and used for public education about this threatened species before they are released in the spring of 2023. ECHO also received 3 map turtle hatchlings in 2022 for headstarting. Another 88 softshells recovered from nests were released into Lake Champlain.

In 2022 we recorded much more than the 585 hatchlings found in 2021, and overall more nests were laid as well. This breaks the downward trend observed from 2018-2021.

