



An Adult Female Spotted Turtle

# An Analysis of the Success of HeadStarted Hatchling Spotted Turtles (*Clemmys guttata*) at Brookhaven National Laboratory



A Headstarted Spotted Turtle Hatchling Sitting on a Tussock Sedge

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## Introduction:

Spotted turtles (*Clemmys guttata*) were once considered the most common turtle in New York, but now are listed as a species of special concern in New York State. This reptile is highly vulnerable to habitat disruption, and its distribution covers the most heavily populated area in the United States.

Headstarting involves obtaining hatchling turtles from monitored or captive breed nests, and then raising them for a prolonged time until they are large enough to avoid high mortality. They are then released into the wild. This theoretically increases juvenile survival and recruitment, and adds valuable adult turtles to the wild population.

Headstarting has not been fully evaluated yet. Programs are usually funded only to raise and release the hatchlings, and not to follow up and analyze the eventual outcome of the project in latter years.

To experimentally evaluate headstarting as a conservation and ecological restoration technique and to augment the lab's spotted turtle population, twenty headstarted turtles were released into two wetlands at Brookhaven National Laboratory. Of these twenty turtles, nine had radio transmitters and were followed during their acclimation from captivity to the wild. One additional transmitter was placed on a native adult female spotted turtle.



A Headstarted Spotted Turtle Hatchling with Transmitter



The Temporary Pond



The Sedge Marsh

## Methods:

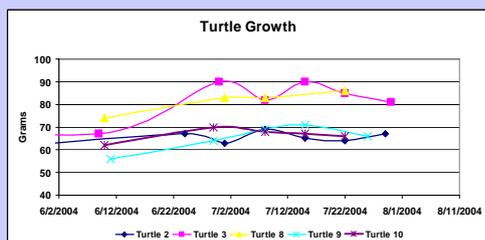
The turtles were released into two ponds: a large temporary pond with mainly open water, and a sedge marsh covered mostly in tussock sedges. Both wetlands have shrubs covering their banks and are part of the Peconic River system.

Eight head started turtles, including three with transmitters, were released on the southwest side of the temporary pond, and eight turtles, including three with transmitters, on the western portion of the sedge marsh on 9 October 2003. A second group of headstarted turtles was released on 8 June 2004: 2 turtles into the temporary pond and one into the sedge marsh at the same release points.

The turtles were tracked up to five times a week. At each location a GPS point was taken, the time was recorded, along with the date, turtle ID, macro habitat, observer, and whether the animal was actually seen or just pinpointed. The weather was recorded in terms of percent cloud cover, water temperature, air temperature, wind speed, and relative humidity. The micro habitat was named, and then further described by water depth, distance to shore, substrate type, level of emergent, submergent, woody vegetation, and coarse woody debris.

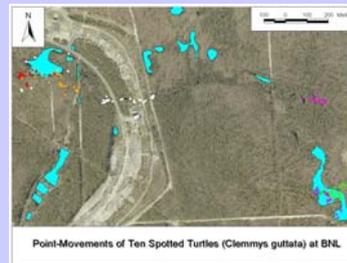
## Results:

Headstarted turtle growth was slow over the study period. The weight over the past year was most variable, and during aestivation, some turtles lost weight.

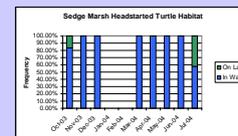
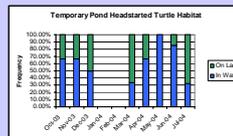
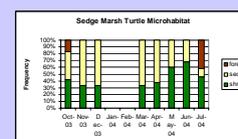
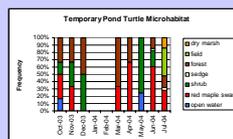


Turtles in the sedge marsh spent significantly less time on land than the turtles from the temporary pond ( $p = 0.008868$ ). The headstarted turtles from this latter pond left the wetland to begin aestivation earlier than the turtles from the sedge marsh. One temporary pond turtle even hibernated on land, and didn't return to the wetland until 19 April 2004.

Microhabitat types varied by what microhabitats were available in each wetland. The microhabitat with a trend most similar for each wetland was shrubs, which is used itself 1.8 times more frequently as much by the turtles at the sedge marsh headstarted turtles than by those at the 12:00 Pond. Within each microhabitat, the vegetation was broken down similarly.



Point-Movements of Ten Spotted Turtles (*Clemmys guttata*) at BNL



## Discussion:

Spotted turtle habitat is traditionally shallow vegetated wetlands with open canopies, such as vernal pools, bogs, and marshes. The sedge marsh fits this description nicely. It has high levels of emergent and shrub vegetation used consistently by the turtles, an open canopy, and is relatively shallow. In contrast, the temporary pool fit the literature's description more loosely. It is mainly open water with little vegetation and it is relatively deep. The sedge marsh turtles were in the water longer, and were in thick, more typical vegetation more often than the temporary pond turtles. The sedge marsh headstarted turtles also aestivated closer to their wetlands, where the temporary pond turtles appear to be dispersing. One such turtle is currently moving downstream along the Peconic River system, heading in the direction of the sedge marsh. This turtle may be dispersing to find better wetland.

No mortality was observed at either site, and the turtles gained weight during their active growing season. The headstarted spotted turtles appear to be adjusting better to life in the wild in the sedge than at the temporary, as they remain in the wetland longer, use microhabitats more characteristic of their species, and do not appear to be emigrating.

Before headstarting can be fully evaluated in terms of whether it is a successful ex situ conservation and ecological restoration technique or not, studies such as this should monitor experimental populations of headstarted turtles for prolonged periods of time after the original threat to the population has been removed, preferably until the headstarted turtles themselves reproduce.



An Aestivating Headstarted Turtle

## Acknowledgements:

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