

CUTTING-EDGE WOOD TURTLE HEAD-START PROGRAM AT GREAT SWAMP NWR

By Laurel Gould, Friends Board Member and Volunteer ; Photos below by Colin Osborn/USFWS: Wood turtle hatchlings (left); female wood turtle on mound with radio transmitter (right)



In 2010, the future of the wood turtle (*Glyptemys insculpta*) population at Great Swamp National Wildlife Refuge was not encouraging. Although Wildlife Biologist Colin Osborn and turtle expert Dr. Kurt Buhmann had been doing surveys over the past five years, and had discovered a new wood turtle population on the refuge (good news), the individuals that they found were nearly all mature adults—there were almost no young wood turtles (bad news). Even though the females' nests were now being protected annually, which increased the production of wood turtle hatchlings each year, there was no evidence that these juvenile wood turtles were surviving, with predation suspected as the primary reason. As shown in the photo above, wood turtle hatchlings are very small (slightly larger than the size of a quarter) with soft shells—a perfect snack for everything from raccoons to great blue herons. There simply were no young turtles to ensure the long-term survival of the refuge's wood turtle population.

It was time to try something different. So, in 2011, funded by the Friends of Great Swamp National Wildlife Refuge, the wood turtle head-start program at the refuge was launched.

What is a head-start program?

According to Dr. Buhmann, “head-starting programs for turtles are presumed to give hatchling turtles a better

chance of surviving their first year by keeping them protected from predators while also giving them the chance to grow when they would normally be hibernating.” Therefore, more individuals are put on the trajectory to maturity than would normally be expected. The goal of this program is to rejuvenate and augment an existing small population of wood turtles on the refuge.

How does a head-start program work?

For several years, Dr. Buhmann had been spearheading a new head-start program for Blanding's turtles (*Emydoidea blandingii*) on the Assabet River National Wildlife Refuge in Massachusetts, partnering with the Bristol County Agricultural High School in Dighton, Massachusetts. High school students had been feeding and caring for the Blanding's turtle hatchlings over the winter. The turtles were then released on the refuge in the spring—at the size of wild four-year olds, even though they themselves were only 9 months old. Subsequent recaptures of the headstarted turtles indicated that a large percentage continued to survive.

Based on this success, Dr. Buhmann asked if the school would be willing to head-start a number of wood turtles from New Jersey. Needless to say, there were permits to be obtained from the NJ Division of Fish and Wildlife (after all, this is a New Jersey Threatened Species) and the Massachusetts Depart-

ment of Fish and Wildlife (to allow the NJ turtles to be sent there). But with these permissions in hand, 22 of 42 hatchlings that were collected from five protected nests in September 2011 were taken to the high school. There, instead of hibernating, they would be fed a diverse diet and kept active all winter. The remaining 20 hatchlings were released at that time on the refuge to forage and hibernate as usual. All of the hatchlings, those that were direct-released as well as the head-starts, were individually marked through a system of notches on the upper shell (carapace). (continued on page 9)



Students measure wood turtles
Photo by Brian Bastarache

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All 22 of the head-start turtles survived and were brought back to the refuge in May 2012. They were all fitted with radio transmitters for tracking during the season and then released near their respective nest sites. During the summer, biology interns tracked the turtles to provide data on survivorship, behavior, habitat use and home range establishment. The questions included whether they would become established in the same area as the adults and whether they would find suitable hibernation sites in the fall.

Progress and Results

This innovative head-start turtle research program is now in its 7th year at Great Swamp NWR. Results are



2012 siblings compared: head-start turtle on left
Photo by Kurt Buhlmann

impressive. In 2013, the team was thrilled to find sibling turtles, both hatched in August 2012 that could be compared side-by-side. According to Dr. Buhlmann, “the larger turtle on the left went to Massachusetts and was fed in the school greenhouse for nine months. The smaller one on the right was directly released on the ref-

uge when it hatched in late August 2012. It did not have much opportunity to grow and simply hibernated to survive the winter. Emerging in the spring, the direct release turtle started growing, but was still a soft pliable snack for predators. The head-started turtle, on the other hand, is much larger and has a hard shell.”

Radio-tracking, recapture, and data collection results show that the young turtles are doing the things that are expected of wood turtles. They start foraging immediately upon release and have been observed eating the natural foods found in their environment, specifically snails, slugs, earthworms, and berries. They are setting up home ranges, using the appropriate wood turtle habitat on the refuge, and growing—substantially. Research shows that head-starting advances these turtles on average by about three to four years in size and mass. Tracking shows that the head-start turtles successfully overwinter, often using the same areas in the streams as the adult wood turtles.

From the 2011 to 2015 cohorts (released in spring 2012 to spring 2016, respectively), a total of 152 head-start wood turtles have been released on the refuge. Survivorship numbers are excellent, based on radio-tracking and recapture of individuals and extrapolating numbers for the entire population. Dr. Buhlmann notes: “From fall 2007 to fall 2015, we released a total of 227 direct-release hatchlings. To date, we have only recaptured three of them (1.3%). Of the aforementioned 152 total

head-starts released to date (through 2016), we documented the existence (recaptured or were actively tracking) 38 of them (25%) in 2016 alone. Those numbers indicate a clear and major survivorship advantage as a result of head-starting.

Research results to date are very promising. With funding from Friends of Great Swamp NWR, the head-start turtle research will continue as there are still unanswered questions, which will require time, continued research, and detailed documentation. The hope is that this head-start concept can be applied to other at-risk turtle species, such as the closely-related, Federally-threatened bog turtle (*Glyptemys muhlenbergii*).

Wildlife biologist Colin Osborn is thrilled: “Head-starting is clearly doing what we hoped it would by increasing the survivorship of these juvenile turtles which should eventually boost the rate of new adults entering the popula-

tion and ultimately increase the population size in the long run.”

It’s hard to imagine a swamp without turtles and Great Swamp NWR has many. Even though it’s a common sight, it’s still thrilling to view a string of painted turtles basking on a log, or catch sight of the smaller spotted turtles as they emerge from winter hibernation, or watch a female snapping turtle as she lays her eggs. As a result of this head-start research program, it is possible wood turtles may one day be a common sight for visitors to the refuge.



The team (l to r) Alyssa Frediani, Colin Osborn, Kurt Buhlmann, Aaron Caswell, Brian Bastarache

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<www.dveaglealliance.org>

Note: Friends have approved funding for this program again in 2018. Join us for an update at the Endangered Species Day, May 2018.