Head-starting diamondback terrapins (Malaclemys terrapin): raising a hatchling group from egg to release in a coastal Virginia rehabilitation program

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One site, one cohort, one timeline

Construction milestones from the city's published project record.

1971 to 1972 — Over a million cubic yards of dredge spoil bury the original tidal wetland.

Mar to Oct 2025 — Eight acres are excavated and regraded to return the site to tidal wetland.

Jun 25, 2025 — A crew uncovers a terrapin nest during excavation and stops to call. The eggs are salvaged the same day.

Aug 18, 2025 — Six hatch while construction is still underway. A seventh hatchling found nearby joins the cohort.

Oct 19, 2025 — Construction wraps. The first measurement session opens the growth record.

Dec 2025 — Marsh grasses go in and first-year establishment begins. Hatchlings are in indoor grow-out.

May to Jul 2026 — Cohort moves outdoors. Salinity is raised in stages ahead of release.

Jul 2026 — Five animals are released into the finished marsh. Two are held back to overwinter.

A species and a site under pressure

Diamondback terrapins are the only North American turtle restricted to brackish estuarine habitat. In Virginia they are a Species of Greatest Conservation Need, pressured by coastal habitat loss, road mortality on causeways, global pet trade, and drowning as bycatch in crab pots.

The nest came from a coastal restoration site in southeastern Virginia where eight acres buried under dredge spoil in the 1970s were being returned to tidal wetland. The work displaced a recently laid terrapin nest. The project also rebuilt the marsh the hatchlings would later be released into: sheltered, newly planted, and away from the crab pots and boat traffic of open water.

Nesting and release locations are withheld. Diamondback terrapins are a target for illegal collection.

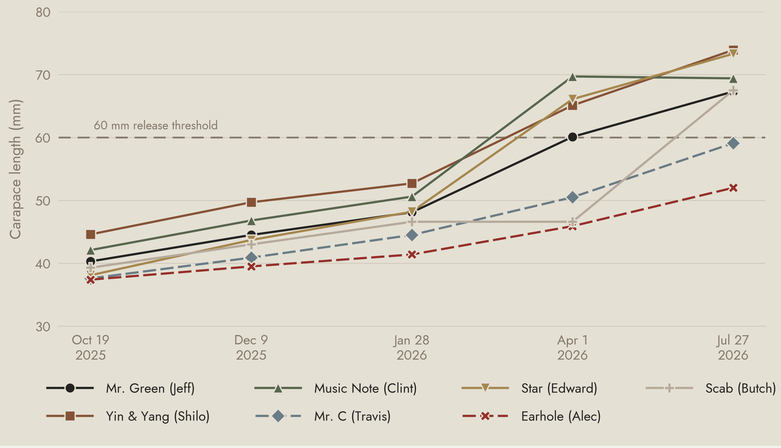
Husbandry and conditioning

- **Incubation:** eggs salvaged, then held in moist vermiculite at a constant 82°F and 85 to 90 percent humidity, hatching approximately 54 days later and held until yolk sacs were fully absorbed
- **Water:** dechlorinated fresh water, no salinity, 50 to 100 percent water changes for smaller hatchlings and filtered aquatic environments as they grew
- **Heat and light:** water / ambient air temperature 80 to 84°F, basking surface 88 to 90°F, UVB light 16 hours daily
- **Enclosures:** depth raised from 1.5 to 6 inches as swimming strengthened, with haul-outs at every stage
- **Diet:** pellets, shrimp, and white fish, diversified to snails, mussels, earthworms, and live prey
- **Conditioning:** outdoors from late spring, salinity raised over the final four weeks from 0 to 9 ppt
- **Individual ID:** plastron photographs, unique to each animal, rather than marking



From salvaged eggs through eleven months of grow-out and conditioning.

Carapace length to release



Dashed lines are the two animals held back. Weight followed the same shape, with every animal roughly doubling in mass between April and July.

Practical constraints of terrapin head-starting

- No other North American turtle has to be conditioned into brackish water before release. Wild hatchlings spend their first year in grasses, shallows, and freshwater pockets rather than full-salinity water, so the goal is partial acclimation rather than matching the release site. The ramp has to be slow enough to not stress the animals and still finish inside the release window.
- Maintaining water quality is additional labor. Terrapins are messy eaters and fouled water is the leading cause of disease in captive hatchlings. Water quality in a small enclosure can degrade in days.
- Drowning can be an early risk. The enclosure has to grow with the animals, rather than be sized for predicted outcome.
- Growth is uneven and time is the only fix. Our slowest animal gained nothing from January to April while the others doubled in size. It required another season rather than a change in diet.
- Reducing handling to avoid habituation. Animals habituated to people may not avoid predators, so we measured five times in eleven months rather than monthly.
- The season constraints determine the release window. Release needs size, water temperature, and the permit window to be aligned. Two animals missed this window and will spend a second winter in rehabilitation care.

Monitoring and records

Behavioral monitoring. turtle-ai, SERC's open-source tool, watched camera feeds and issued real-time alerts, reducing handling. It is an offline system running local models, with no cloud service involved.

From paper to data. Handwritten sheets were transcribed with AI assistance into a structured record, with human review at every step. That surfaced an error with April carapace measurement values and one animal with zero weight gain from January to April.

turtle-ai is free and open source: github.com/southeastreptile/turtle-ai





Head-started hatchlings released into the restored marsh, July 2026.

The cohort at release

All seven survived the eleven-month head-start. Five reached the 60 mm release size within the seasonal constraints. Weight gains ran from +130 to +400 percent.

Animal	Length	Mass	Gain	Outcome
Mr. Green (Jeff)	67.3 mm	54 g	+280%	Released
Yin & Yang (Shilo)	73.9 mm	74 g	+274%	Released
Music Note (Clint)	69.4 mm	71 g	+318%	Released
Mr. C (Travis)	59.1 mm	45 g	+298%	Overwintering
Star (Edward)	73.3 mm	71 g	+400%	Released
Earhole (Alec)	52 mm	26 g	+130%	Overwintering
Scab (Butch)	67.5 mm	62 g	+337%	Released

Release

Release required all four criteria: 60 mm carapace length, sound body condition and normal behavior, one to two weeks held at conditioning salinity, and site water above 65°F.

Five met the criteria. Two fell short, one by 0.9 mm, and are overwintering for release next season in rehabilitative care. One of them is the animal the processed records flagged for slow growth months earlier.

Virginia permit conditions restrict releases from May 1 to October 1, which sets the outer bound on how long a turtle can be held before the decision defers to the following year.

Limitations and next steps

- One cohort of seven, with no control group and no post-release monitoring. Survival benefit cannot be demonstrated here due to lack of PIT tagging or radio transmitters.
- Future: tagging and recapture efforts, and coordination with the site's ten-year monitoring program. Photo-matching on unique shell patterns for individual identification.

A nest displaced by construction, raised through the construction, and returned to the marsh that the construction restored.

Thanks to Jill Doczi, Reanna Montanez, Johnnae Davis, and Travis Webb for hands-on care and record keeping behind every number here. Thanks also to the construction crew who stopped work and made the call.

The full write-up — How this cohort was tracked, and what the records showed

turtle-ai — github.com/southeastreptile/turtle-ai

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