

LONG ISLAND DIAMONDBACK TERRAPIN
MONITORING WORKSHOP
TRAINING CITIZEN SCIENTISTS

Friday, June 5th

2:00 - 4:00 pm

Virtual meeting on Zoom

Registration required



Welcome to the Peconic Estuary Partnership's
CITIZENS' ADVISORY COMMITTEE MEETING
co-hosted with Seatuck Environmental Association and
Dr. Russell Burke of the Jamaica Bay Terrapin Project





The Seatuck Environmental Association is a member-supported 501(c)(3) organization dedicated to conserving Long Island wildlife and the environment.

The organization pursues its mission by:

- 1) employing a multi-pronged approach to various wildlife conservation projects, and
- 2) offering high quality environmental education opportunities for Long Islanders of all ages.



Seatuck works to protect wildlife and restore habitat across Long Island. [Learn More](#)



Exposing people to the diversity, beauty and wonder of Long Island's natural world. [Learn More](#)



Seatuck operates two public nature centers along the shores of the Great South Bay. [Learn More](#)

The Diamondback Terrapin

The Turtle with the Clown Lips



And then there are turtle fans
with terrapin lips.....



A most stunning reptile

Malaclemys terrapin, meaning mollusk-eating turtle.
They are named for their diamond-shaped scutes and each are individually patterned.



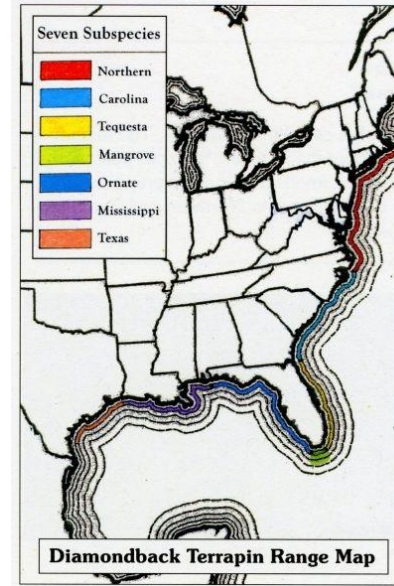
TODD PIERSON 2011



Distribution



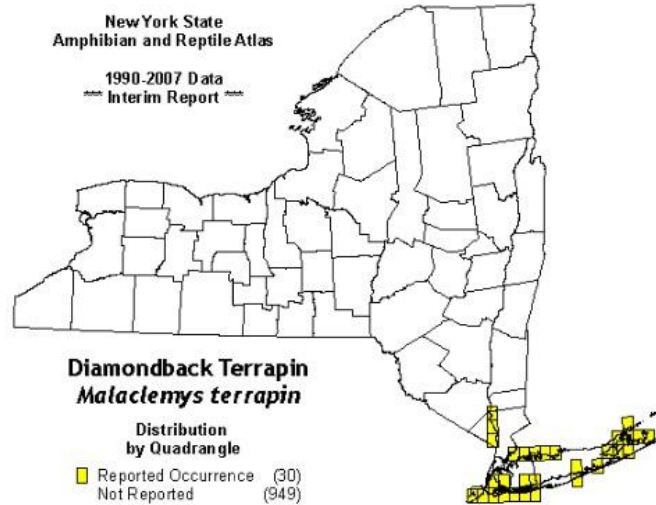
A coast hugging turtle - Brennessel



From Cape Cod to the Rio Grande

NYS Distribution

Northern Diamondback Terrapin Distribution Map



- NYS Amphibian & Reptile Atlas

A lover of brackish waters



Anatomical & Physiological Facts

Highly developed lachrymal glands - In humans, these are commonly called tear glands. Human tears are a little salty, but terrapin tears are twice as salty as sea water. This helps flush out excess salt that they have ingested. Sea turtles do the same. People have seen sea turtles "crying" as they lay their eggs on the beach, and assumed it was the pain of childbirth that was causing them to cry. They are just getting rid of their extra salt. Crocodiles have developed a similar mechanism, which is where the term crocodile tears originated.

Specially shaped lower jaw - Terrapins prefer to drink fresh water, since it saves them the trouble of getting rid of the excess salt (and I'm sure it tastes better). When it rains, terrapins will drink from puddles on the ground, collected on leaves, and even collected in the nooks and crannies of their friend's shells. The lower jaw of the terrapin has evolved into a sloping, scoop shape without a "chin". This allows them to drink from puddles as shallow as 1 mm. The box turtle needs a puddle at least 5 mm deep to get a drink.

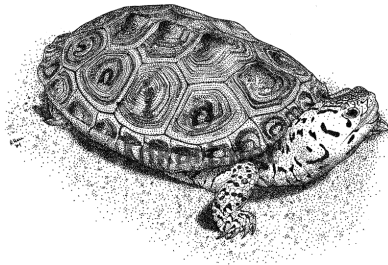
Drinks like a camel - Camels and terrapins have a similar problem - access to fresh drinking water. They have developed a similar adaptation - the ability to quickly drink a large amount of water when it becomes available. A terrapin can drink up to 15% of his body weight in 15 minutes. That would be like me chugging 4 gallons of water! Even better, if the terrapin is attacked by an enemy after a drinking binge, it will regurgitate its water before fleeing. Between the surprise of the barf and the lighter load to carry, this may give the terrapin the edge it needs to escape.

Skims the top of the water - When it rains, a layer of fresh rainwater collects on the surface of the brackish water. Using a behavioral adaptation, the terrapin will drink from this top layer before it mixes with the rest of the water.

Catches falling rain drops - I had a hard time believing this one, but I did read it in more than one reputable source. I think a terrapin would have to be pretty loaded up with salt, and it would have to be raining pretty hard, for this behavior to be worth the effort.

Strong jaws - Terrapins can break into some of the tough food found in coastal wetlands, including clams and periwinkle snails (their favorite NJ invasive species).

Webbed feet - Midway on the evolutionary scale between the stump-like feet of land tortoises and the flippers of sea turtles, terrapins have webbed feet adapted to their middle-of-the-scale environment.

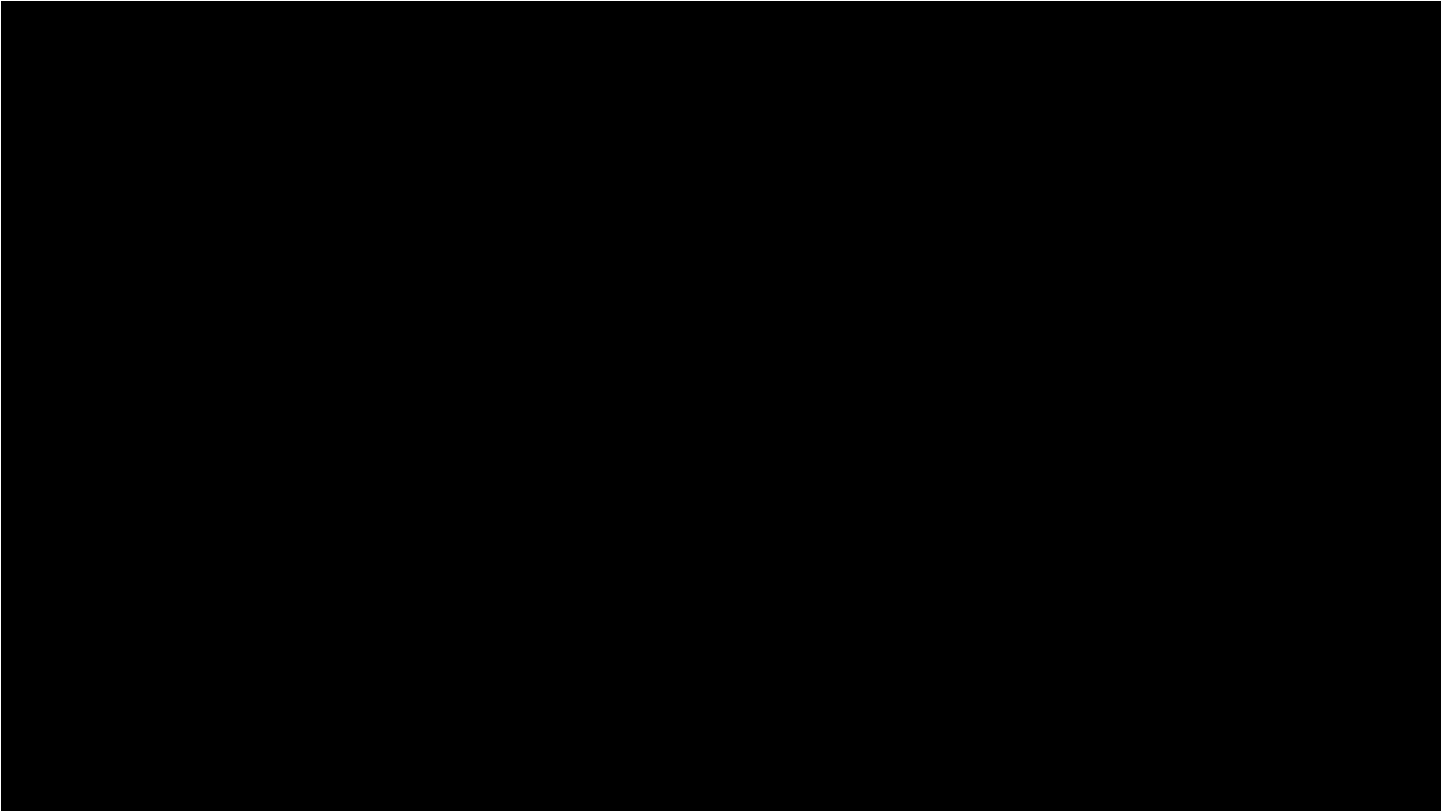


- Wetland Institute

Nesting

Terrapins generally use sandy, unvegetated areas. Nesting season lasts typically from early June through late July. Their mean clutch size is 11 eggs but can range from 3 to 18. Some females “multi-clutch”. There is a 60 – 90 day incubation period.





During the nesting season they are wanderers of runways...



Sexual Dimorphism



Female on bottom



Male on bottom



Males have longer tails



Subspecies, *Ornata*

Diet

Consists of mollusks, crustaceans, snails, insects, fish, and carrion.

Common
Periwinkle



Blue Crab



Marsh
Periwinkle



Fiddler Crab



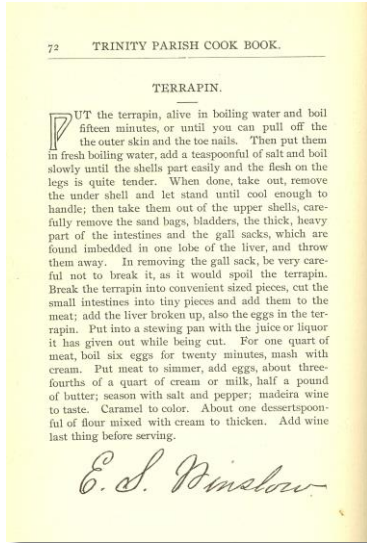
Carrion



Soft-shelled
clams



Terrapin Stew



72

TRINITY PARISH COOK BOOK.

TERRAPIN.

PUT the terrapin, alive in boiling water and boil fifteen minutes, or until you can pull off the outer skin and the toe nails. Then put them in fresh boiling water, add a teaspoonful of salt and boil slowly until the shells part easily and the flesh on the legs is quite tender. When done, take out, remove the under shell and let stand until cool enough to handle; then take them out of the upper shells, carefully remove the sand bags, bladders, the thick, heavy part of the intestines and the gall sacks, which are found imbedded in one lobe of the liver, and throw them away. In removing the gall sack, be very careful not to break it, as it would spoil the terrapin. Break the terrapin into convenient sized pieces, cut the small intestines into tiny pieces and add them to the meat; add the liver broken up, also the eggs in the terrapin. Put into a stewing pan with the juice or liquor it has given out while being cut. For one quart of meat, boil six eggs for twenty minutes, mash with cream. Put meat to simmer, add eggs, about three-fourths of a quart of cream or milk, half a pound of butter; season with salt and pepper; madeira wine to taste. Caramelize to color. About one dessertspoonful of flour mixed with cream to thicken. Add wine last thing before serving.

E. S. Winslow



MARYLAND DIAMONDBACK TERRAPIN SOUP



Serves 8 to 10

- | | |
|--|---|
| <i>1 stick butter</i> | <i>3 terrapins, 5 to 7 inches
in length (2 small cans
may be substituted)</i> |
| <i>2 tablespoons flour</i> | |
| <i>1 quart fresh milk</i> | |
| <i>salt and pepper</i> | <i>½ pint thick cream</i> |
| <i>6 hard-boiled eggs, sep-
arated</i> | <i>½ cup sherry wine (op-
tional, to be passed
after soup is served)</i> |

Melt the butter in good-sized saucepan, blend in the flour, then add the milk, salt and pepper and the hard-boiled egg whites which have been chopped fine, then add the terrapin meat (for preparation see above) as is. Mash the egg yolks and add them to the soup mixture. Simmer until thick. Then add the thick cream. Serve hot. When soup has been served, pass sherry wine to be added by individual. Or just before serving, ½ cup of good sherry wine can be mixed in the soup. Maryland beaten biscuits (page 105) are a delicious addition to this rich soup course. Or saltine crackers may be served.

As you might expect, their popularity caused their decline. In Maryland - the only state to keep detailed records - terrapin harvest peaked in 1891 with over 58,000 females captured. (At nearly three times the size of males, female turtles made much better stew.) By 1900, the harvest had dropped to a mere 1,400 terrapin. Depleted stocks led to increased prices and then Prohibition became their saving grace, because alcohol was a key ingredient in terrapin stew. People all but forgot what had been one of the most economically important reptiles in the history of the world.

Cultural Icons

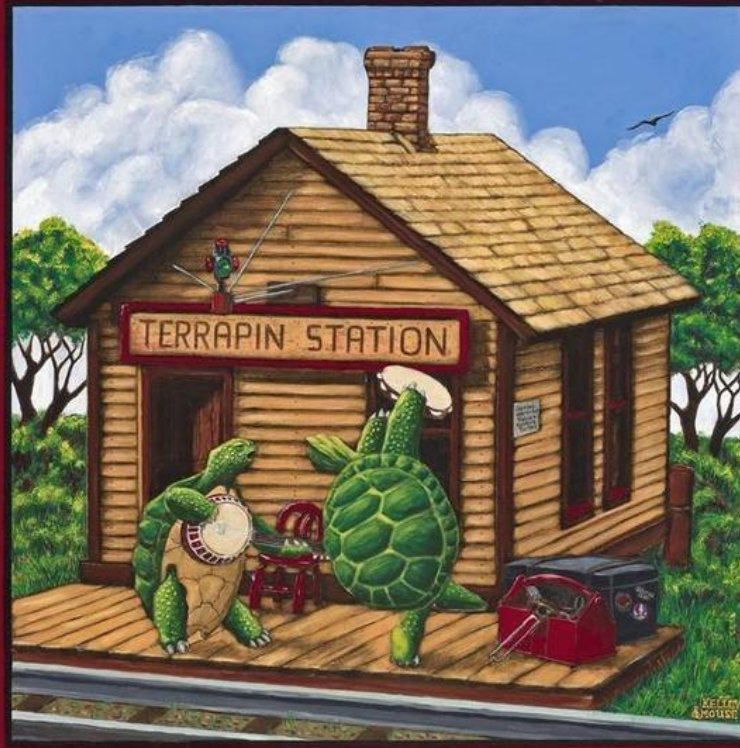
Maryland Terps!



Fear the Turtle

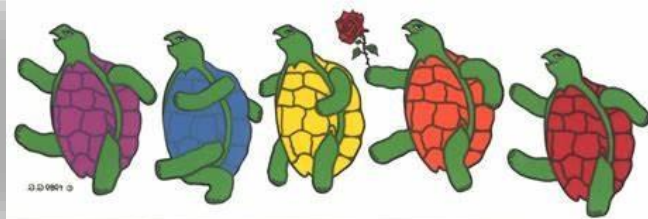


GRATEFUL DEAD



1977

Threats and Solutions



Closing the Commercial Harvest

NY State Register: Protection of diamondback terrapin.
To close the open season on diamondback terrapin

04-26-17 Proposed 09-20-17 Finalized

3. Needs and benefits

This rule making addresses two issues: (1) it eliminates the harvest season on diamondback terrapins authorized by 11-0311. Declines in terrapin populations across its range have caused concerns for the loss of adult terrapins including losses to legal harvest. New York is now the only state in the range of the diamondback terrapin that still has a legal harvest. Closure of this harvest is in response to this threat to New York populations.

(2) In 2007, all New York native turtles were granted small game status with the exception of the diamondback terrapin. This exclusion of the terrapin was solely because of the special harvest season in effect at the time. Addition of the diamondback terrapin to the list of native turtles is appropriate and consistent with its status as a Species of Greatest Conservation Need because, with the exception of the snapping turtle, there is no open season for the native turtles.



Drowning in Active Non-collapsible Crab Pots



Enactment of Regulation Requiring Terrapin Excluder Devices on Crab Pots

“Marine Fisheries Issues

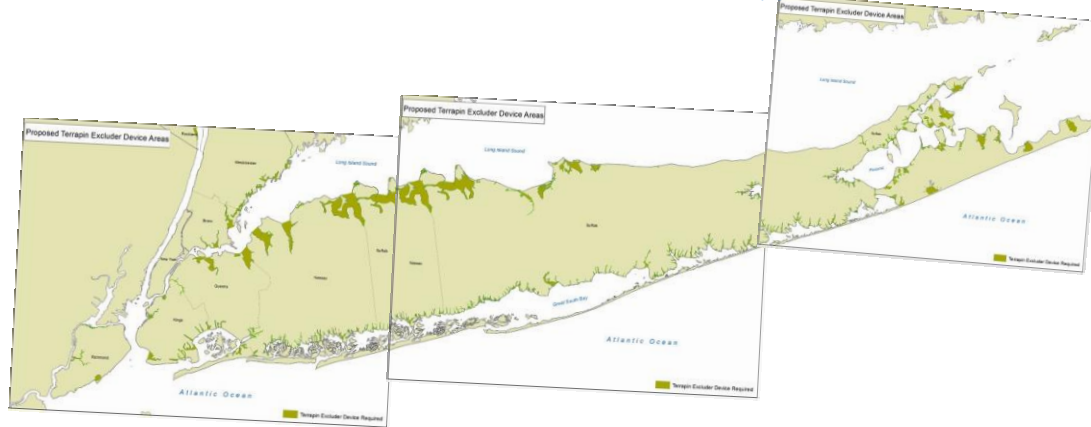
Crustacean Omnibus Regulatory Package Update

This regulatory package, which includes the requirement for terrapin excluder devices (TEDs) measuring 1-3/4" x 4-3/4" on commercial crab pots set in near shore harbors, creeks, coves, rivers and tributaries, will be available for public comment this spring.

The department expects to adopt this rulemaking this summer.

We are notifying you of the timing of this rule implementation so that you may consider installing TEDs on your crab pots before you begin setting your crab pots this year; or you may choose to install the TEDs on your crab pots when the rule goes into effect this summer.

A small number of TEDs (provided by TNC and Seatuck) will be available to crab pot fishers that have reported blue crab landings within the last two years (2015 and/or 2016) as of March 1, 2017, on a first come/first serve basis at no cost. Please contact us at 631-444-0429 or NYBlueCrab@dec.ny.gov for more information."



6 NYCRR 44.2 (a) (3) is amended to read as follows:

(3) 'Terrapin Excluder Device' means a rectangular [metal] device not larger than (in either dimension) [6] four and three-quarters inches wide by [2] one and three-quarters inches high attached to the end of the entrance funnel of a crab trap.

Paragraph 6 NYCRR 44.2 (d) (1) is repealed.

New paragraph 6 NYCRR 44.2 (d) (1) is adopted to read as follows:

(1) A terrapin excluder device, as defined in paragraph 44.2 (a) (3) of this section, must be used on all non-collapsible, Chesapeake-style crab-pots or traps that are fished in the areas detailed below:

(i) within the bays, harbors, coves, rivers, tributaries and creeks that enter into Long Island Sound;

(ii) within the harbors, coves, ponds, rivers and creeks that enter into Flanders Bay, Great Peconic Bay, Cutchogue Harbor, Little Peconic Bay, Hog Neck Bay, Noyack Bay, Southold Bay, Shelter Island Sound, Pipes Cove, Greenport Harbor, Orient Harbor, Hallock Bay, Northwest Harbor, Gardiners Bay, Napeague Bay and Fort Pond Bay;

(iii) within the rivers, tributaries, creeks, and basins that enter into Jamaica Bay, Hempstead Bay, South Oyster Bay, Great South Bay, Moriches Bay and Shinnecock Bay on the south shore of Long Island;

(iv) within the creeks and tributaries that enter into Raritan Bay, Arthur Kill, and Kill Van Kull surrounding Staten Island; and

(v) within the tributaries and creeks of the Hudson River that lie within the marine and coastal district, as defined in Environmental Conservation Law 13-0103, including the waterways within Piermont marsh.

6 NYCRR 44.2 (d) (2) and (3) are amended to read as follows:

(2) The terrapin excluder device, as defined in paragraph 44.2 (a)(3) of this section, shall be securely fastened inside each funnel to effectively reduce the size of the funnel opening to no larger than [six] four and three-quarters inches wide and [two] one and three-quarters inches high.

(3) If the department determines that mortality of diamondback terrapin ("*Malaclemys terrapin*") in blue crab pots is causing a decline in the terrapin population of a given water body or area that is not listed in paragraph (d)(1) of this Section, the department may by order mandate use of terrapin excluder devices in such areas. The Director, [Bureau] Division of Marine Resources, is authorized to issue orders to designate areas in which terrapin excluders are required pursuant to this section.

“Ghost” Fishing Pots



94 terrapins died in this trap



S T A T E O F N E W Y O R K

4755

2019-2020 Regular Sessions

I N A S S E M B L Y

February 5, 2019

Introduced by M. of A. ENGLEBRIGHT -- read once and referred to the
Committee on Environmental Conservation

AN ACT to amend the environmental conservation law, in relation to the
prevention and mitigation of marine and coastal debris

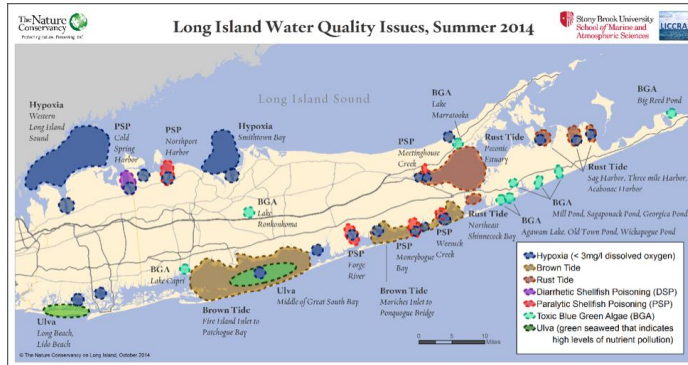
THE PEOPLE OF THE STATE OF NEW YORK, REPRESENTED IN SENATE AND ASSEM-

Toxic Algae Blooms

Red tide algae (*Alexandrium*) produce saxitoxin, a marine biotoxin. It can be fatal to terrapins when they ingest snails that have ingested the algae.



Peconic Bay, 2015



Excessive Predation



Shoreline Hardening



Bulkhead



Rip-Rap

Road-kill





Terrapin Tubing @ Cedar Beach, Mt. Sinai Harbor







Incubating eggs

Making life from loss



Between 1989 and 2007, volunteers working on the Wetlands Institute's Diamondback Terrapin Conservation Project have salvaged more than 10,000 potentially viable eggs from road-killed terrapins. Over 6,000 of these have hatched. For example, in 2007, 200 head-started hatchlings were released while 382 adult females were traffic fatalities.



Turtle Gardens

[Conserve Wildlife Foundation of New Jersey](#)

[Project Terrapin](#)



Effects of Global Climate Change

Temperature-Dependent Sex Determination in the Diamond-backed Terrapin (*Malaclemys terrapin*)
RUSSELL L. BURKE¹ AND ARTHUR M. CALICHIO
Department of Biology, Hofstra University, Hempstead, New York 11549 USA

In their landmark paper, Ewert and Nelson (1991) reported sex determination data for a wide range of turtle species, laying the groundwork for multispecies analyses of sex determination patterns in reptiles. Of particular interest was the Emydidae, wherein both temperature-dependent sex determination (TSD) and genotypic sex determination (GSD). Among TSD turtles there are two patterns known, TSD Ia and TSD II, but their evolutionary and ecological significance remains enigmatic (Ewert et al., 2004). Although Ewert and Nelson (1991) reported detailed information for many emydids, their data for Diamond-backed Terrapins (*Malaclemys terrapin*) were limited. Their article showed only that Diamond-backed Terrapins have TSD, with all female hatchlings from eggs (Accomac County, Virginia; Hotaling, pers. comm.) incubated at 30.8C and all male hatchlings from eggs (from Bergen County, New Jersey, E. Hotaling, pers. comm.) incubated at 24.8C. Later, Jeyasuria et al. (1994) incubated Diamond-backed Terrapin eggs from St. Mary's County, Maryland, and found that high temperatures (31 and 32.8C) resulted in 100% female hatchlings and low incubation temperatures (26 and 27.8C) resulted in 100% male hatchlings and that eggs incubated at 29.58C resulted in 13% male hatchlings. Thus, Diamond-backed Terrapins seem to be a typical TSD Ia species (Ewert and Nelson, 1991), with a single transitional temperature range; incubation temperatures below this range result in males, whereas incubation temperatures above this range produce females.

A wide range effort

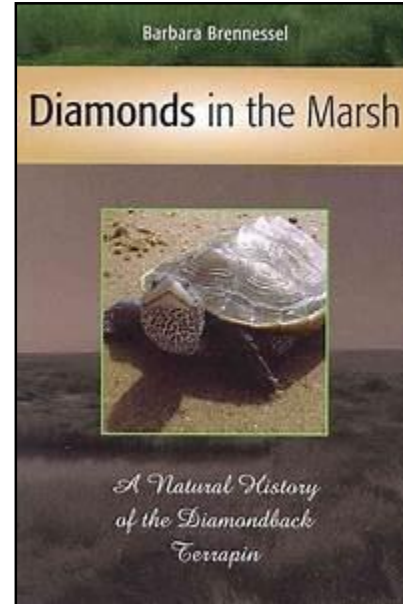
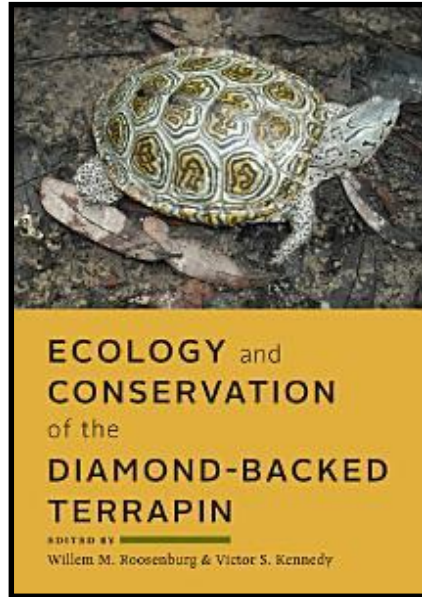


The Diamondback Terrapin Working Group is dedicated to diamondback terrapin research, conservation, management, and education.

The Diamondback Terrapin Working Group was formed in 2004 by individuals from academic, scientific, regulatory and private institutions/organizations working to promote the conservation of the diamondback terrapin, the preservation of intact, wild terrapin populations and their associated ecosystems throughout their range.

The Diamondback Terrapin Working Group is committed to and supports research, management, conservation, and education efforts with the above goals in mind.

Literature

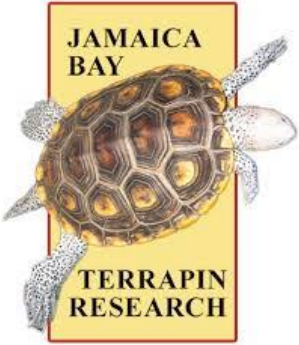




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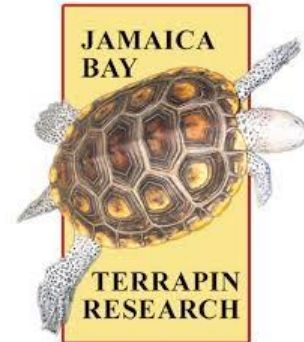


Conducting a large-scale citizen-science research project on terrapins in Jamaica Bay (NYC) since 1998
Focus on nesting behavior, conservation, ecology

Remember our state (NYSDEC) wildlife regulations:

You may not harvest, **take**, or **possess** any native reptiles at any time except; snapping turtles under certain conditions with a NYSDEC permit.

So don't attempt to capture terrapins or handle them





Terrapins are the only turtles you're likely to see in brackish or salt water

**Observing terrapins while they're in the water:
From kayaks, canoes, boats, etc.**



Observing terrapins while they're in the water: When they're cruising to nest



Observing terrapins while they're in the water: Basking



Observing terrapins while they're in the water: Drones



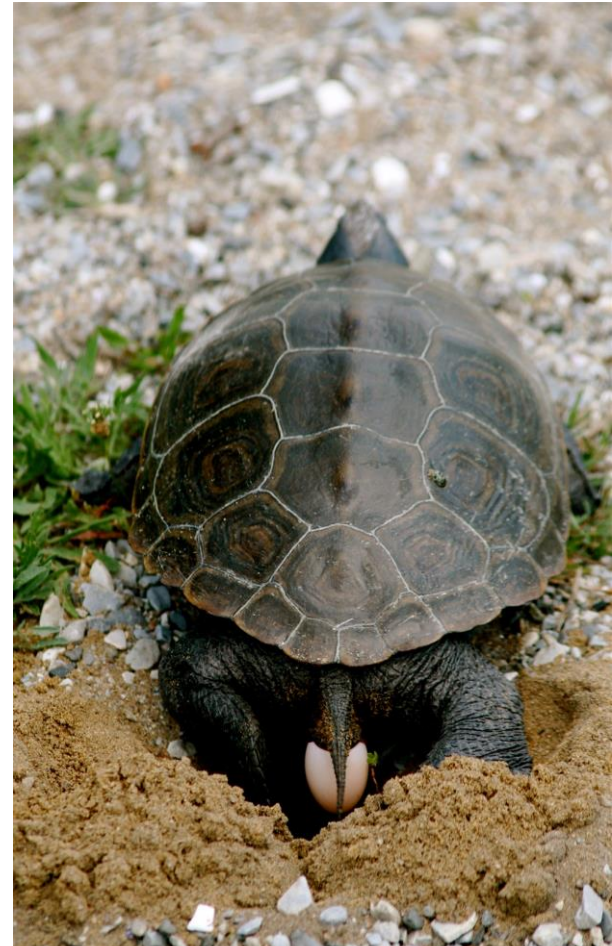
Observing terrapins while they're on land to nest



Observing terrapins while they're on land to nest



Observing terrapins while they're nesting



Finding nests on land: Test holes



Finding nests on land: Adult crawl trails



Finding nests on land: After predation



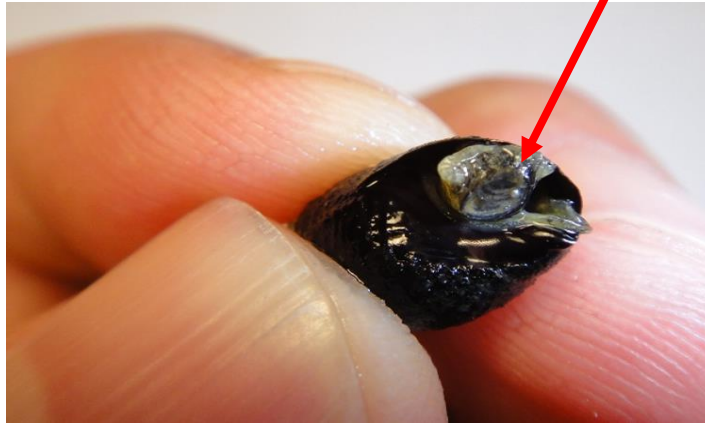
**Finding nests on land:
After emergence hatchling trails**



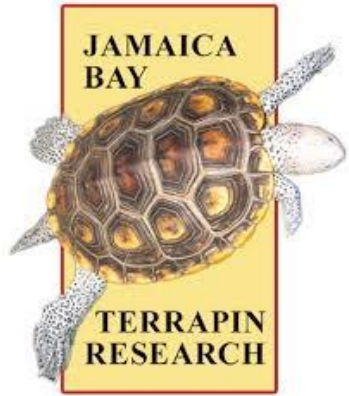
Detecting and counting terrapins: Using their parasites

3 species involved:

- Trematodes: the fluke *Pleurogonius malaclemys*
- Eastern Mudsnails (*Ilyanassa obsoleta*)
- Diamondback terrapins



<https://www.youtube.com/watch?v=PGRGUjiHq3s>



Diamondback Terrapin Working Group



dtwg.org

Contact Information: Dr. Russell Burke





Website: jbtr.org

Email: biorlb@hofstra.edu





Our mission is to protect and restore the Peconic Estuary and its watershed.

Water Quality  Habitat & Wildlife  Climate Change  Strong Partnerships & Engagement 



“Estuary of National Significance”

PEP Diamondback Terrapin Monitoring



Survey areas of salt marsh for terrapin activity to determine where their nesting habitat is located.

Type of Habitat for Nesting



Photos by Kaitlin Morris

Evidence of Terrapin Activity



Tracks

Distinct tracks left by a turtle dragging her shell along the sand.



Test Nest

A hole left by a female when she chooses to nest elsewhere.



Predated Nest

Shriveled white eggshells & predator tracks make this an easy find.

Predated Nest



Overwintered Hatchlings' Eggs



Photo by Paul King III

Threats: Hardening Shorelines



Beneficial Alternative: Living Shorelines

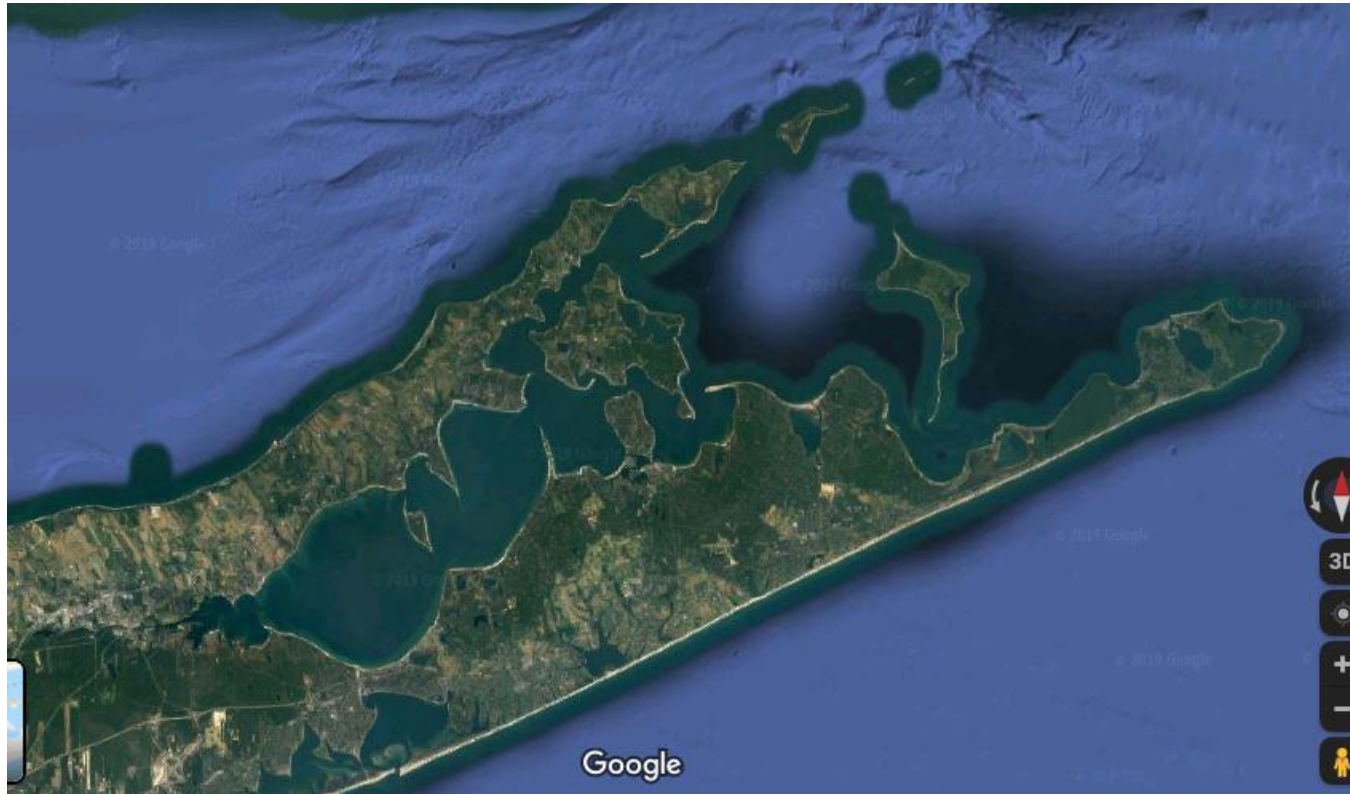


PEP Diamondback Terrapin Monitoring



- Late May-early August, during the terrapin nesting season
- Northwest Harbor County Park, Sag Harbor
- 3 days/week at high tide
- Based on each moon phase:
Full moon, New moon, first quarter, and third quarter
- Focus is to look for evidence that terrapins are utilizing the site.

Need for Expansion



Wildlife Monitoring Network



Photo: Kaitlin Morris



Photo: Kaitlin Morris



Photo: Barry Udelson



Photo: Mike Bottini



Photo: Jenna Schwerzmann





Contact Information:

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Social Media:





Diamondback Terrapin Watch Survey

We will go over:

- What is Survey 123?
- How to navigate to the survey
- Overview of survey questions
- Browser versus mobile application



*Diamondback Terrapin Watch Survey
Link and QR Code:*

<https://arcq.is/1mPSjT>

Diamondback Terrapin Watch

This survey is designed to generate information about nesting and foraging locations of diamondback terrapins on Long Island. Data collected will be used to further terrapin conservation.

How to use:
This survey is broken down into two main sections, "evidence of terrapins", and "terrapins". If you have witnessed clues that signify a terrapin has been in an area (i.e. tracks, nests), use the evidence of terrapins section to describe your scenario.

If you are actively seeing a terrapin and witnessing their behavior, please use the numbered terrapin section to describe the behavior of each terrapin you see. If you do not see a choice that fits, please use "other" and describe what you are seeing. Thank you!

Name*

Email*

Thank you!

Questions?



Contact Information:
Arielle Santos, Policy Program Coordinator
asantos@seatuck.org



Websites: PeconicEstuary.org Seatuck.org jbtr.org