



CONSERVE WILDLIFE

FOUNDATION OF NEW JERSEY

GREAT BAY TERRAPIN PROJECT – 2023 REPORT SC2023048

Northern diamondback terrapin nesting within our project area began during the last week of May. Leading up to this was the observance of many adults in breeding congregations in the local area. The first large wave of nesting adults was observed during the first week of June, when temperatures reached 80 degrees F and there was a full moon, which occurred on June 3. The first roadkill of the season was observed on June 1 on Great Bat Blvd. For this roadkill, reported by a volunteer, we responded by salvaging six eggs from the gravid female and placed them at our enhancement site/turtle garden nearby. Unfortunately, results from monitoring the site showed that they did not hatch.



A DOR female on GBB and salvaged eggs being placed in a nearby enhancement site for natural incubation. June 2023.

Surveys of roads within our project area in S. Ocean County began during the last week of May. A total of 107 terrapins were recorded from May 27 to June 10. The following week, 256 were observed either crossing local roads or nesting nearby. Throughout the entire season, staff and volunteers recorded a total of 840 terrapins. Of those a total of 69 (8.2%) were observed dead on road.

Three quarters of our sightings were of terrapins on Great Bay Blvd, which is the focus of this conservation project. There a total of 613 terrapins were observed. A total of 45 (7.3%) were observed dead on road. The remaining terrapins were observed on other roads within our project area, including Loveladies (LBI), Stafford Township, Eagleswood, Little Egg Harbor, and Tuckerton. The roadkill rate on Great Bay Blvd this year was closer to the ten year average (6%) at 7.34%.



Terrapins killed overnight on June 27-28, 2023 on Great Bay Blvd, Little Egg Harbor Township, NJ.

On one particular day, June 28, eight roadkills were observed from 7:25AM to 8:30AM. These roadkills were recorded during the first surveys of the day and illustrate when most roadkills occur — during the overnight/early morning hours. This has been previously observed in the past and there is little that can be done to prevent it.

PURPOSE OF STUDY

*Since beginning in 2010, the purpose of this project has been to document the presence of adult female Northern diamondback terrapins (*Malaclemys terrapin terrapin*) on roads in Barnegat Bay, Great Bay, and Absecon Bay watersheds (S Ocean, SE Burlington and N Atlantic Counties) with Great Bay Blvd. as our core project area. Using the data collected, we highlighted roadkill “hot spots” or sections of roads where many adult female terrapins were hit by car. We then worked with local municipalities and county/state government to raise awareness for encountering terrapins on roads by asking them to install large, high visibility X-ING signs in these areas.*

Our primary goal is to reduce road kills of adult female terrapins. A secondary goal is to educate the public about the importance of terrapins within the coastal ecosystem. Our final goal is to identify and enhance nesting habitat for adult females to nest.



A group of adult terrapins basking on the shoreline within Great Bay Blvd. WMA.

Each year Conserve Wildlife Foundation of NJ (CWF) recruits volunteers (NJDEP Fish & Wildlife-Wildlife Conservation Corps) and student interns to assist with seasonal road patrols/surveys to document the occurrence of terrapins on roads within our project area. These surveys are conducted during the summer months from late May to mid-July. During this time we also try to raise awareness by alerting drivers through online social media and physical roadside caution signs. Lastly, we work closely with local, county and state road management agencies to address areas where significant roadkills occur.

Terrapins encountered on Great Bay Blvd. from 2012 to 2023. 2005 is provided as a reference from previous research conducted on road occurrence by S. Egger.

Year	2005	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
# Live Terrapins	547	1027	913	342	801	737	708	694	417	857	406	702	568
# Dead Terrapins	53	36	38	35	34	46	24	57	48	83*	43	25	45
Total	600	1063	951	377	835	783	732	757	465	857	449	727	613

To help better understand how the road impacts the local population, in 2016 we began to mark adults encountered on Great Bay Blvd. using volunteer student research interns. The interns who work on this project essentially lead fieldwork and have played an integral role in ensuring the success of the project. They have helped mark around 1000 adult female terrapins over seven years on Great Bay Blvd.

Road surveys are conducted during the terrapin nesting season, from late May through July. While driving, the volunteer surveyor or research intern (sub-permittee) watches for terrapins in the roadway. If it is safe to exit the vehicle and one is encountered, they stop/pull over their vehicle and record data on their observation. If it is not safe, then observations are marked using a GPS and data sheet and the survey continues (usually the case for busy highways Garden State Parkway, Route 72, Route 30).

The majority of surveys are conducted during the day from 0700 – 1700 hours using a motor vehicle. Our primary road is Great Bay Blvd. (where notching occurs by our interns) but also includes other local municipal roads that transect saltmarsh habitat, including Route 72, E. Bay Ave., Cedar Run Dock Rd, West Creek Dock Rd., Parkertown Dock Rd., S. Green St., Radio Rd., Route 9 (Burlington & Atlantic Counties), and Route 30 (Route 30 was not covered this year).

In general, surveys are timed to occur during the day and around high tide, when female terrapins are more actively searching for suitable nest sites. When a terrapin is encountered, data is collected and the terrapin is either allowed to continue what it was doing (volunteer

surveyor) or captured by hand (research intern) to be further analyzed. Our surveyors record the date, time and condition of the animal.

In 2023, the majority of observations were recorded using the iNaturalist app, where the date, time and location of the sighting are automatically generated. A photo can also be added to the observation and if a photo of the carapace is added, it can help determine the identity, if notched. Observations/sightings recorded using iNaturalist must be added to our “**Great Bay Terrapin Project**” for them to be included in our project. We previously utilized shared equipment, including a clipboard with paper data sheets and a Garmin GPS, but since Covid, many of our volunteers have preferred to use iNaturalist.



2023 CWF Student Research Intern James W. holds an adult female terrapin.

Once an observation has been recorded the terrapin is placed in the direction they are heading and out of harms way. Nesting terrapins are not disturbed. We stress to all of our volunteers to never put their own life in jeopardy when trying to save a terrapin from being hit by car.

More detailed surveys are done by our student research interns. Their surveys are only conducted on Great Bay Blvd. and at a much slower pace. In addition to collecting data that our volunteers collect, they also take measurements and mark terrapins, if unmarked. Terrapins are weighed and examined to determine if they are gravid. Their body condition is noted and their shells are examined. They are scanned for PIT tags and previous notch codes. If the terrapin is unmarked, then a seven letter code is assigned and filed into their marginal scutes with a half round file (codes are provided to us by Dr. John Wnek with MATES/Project Terrapin). A PIT tag is injected into the rear abdominal cavity of the terrapin before release. Data is recorded on a paper data-sheet and the terrapin is usually released in less than 15 minutes from when it was captured.

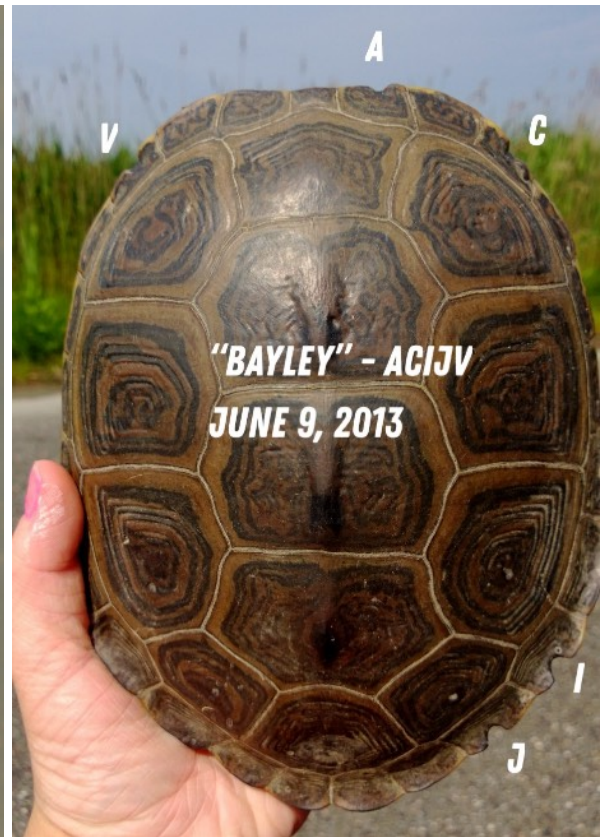
RESULTS AND SUMMARY

In 2023, a total of 840 terrapins were recorded in our project area by staff and volunteers. Of those 69 were found injured or dead. On Great Bay Blvd 350 were found by our student research interns, including six that were found DOR. 298 were newly marked.

	<i>Live</i>	<i>Dead/ Injured</i>	<i>Total</i>
Great Bay Blvd	568	45	613
Other roads	203	24	227
Total:	771	69	840

The average carapace length, width and height was 175.6mm, 135mm, and 72.3mm. The average plastron length was 162.9mm. The average weight was 938.7 grams. A total of 258 were gravid at the time of capture. The smallest adult female encountered was 145mm and weighed 569g and the largest was 213mm and weighed 1435g. Seven terrapins captured were 200mm or greater and weighed an average of 1384g. The average age of adult terrapins (where the annuli was pronounced) was 8 years old.

We encountered 42 recaptures this year. Those were: BKNQVW, CHIJNO (2016); HIPQVX (2017); IJKOPW, ACKMOP, HNPQWX, ACKMOW, ACKMQX, ACJMPQ, CHIQW, ACJMPX (2018); BHJMPX, CJMOPQ, BCMNOP, BHKMVX (3) (2019); AJKMNW, AKMNVW, AJMNVX (2020); BCIMPQV, BCIJKVX, BCHMOQW, BCIKOPW, BCHMNOQ, BCHKMNO (2021); HILNOVW, BCJKOPQ, HILNOQV, BCIKQV, BCLPQVX, BCJKNPW, HJKLOPW (2022); HJLNOWX, IJLPQWX (2023); and those of unknown origin: IJKLMOP, CIKO, BIJKLOP, CIOPW, BCLNPW, CHIJKNP, HKLNOQX. One interesting finding was BHKMVX that was found on three different days in the same general area. She was gravid on the first encounter and not on the second two encounters, where she still ventured onto into the roadway when not gravid.



Bayley after being released and when last captured in 2013.

On June 19, 2023, we partnered on the release of ACIJV or “Bayley” who was originally captured on GBB on 6/20/08 by Claire Sheridan. ACIJV was then recaptured by one of our student research interns on 6/9/2013. Then ACIJV was taken from the wild and sold into the pet trade. She was then found in late 2019 at a reptile expo in Maine. After that, she was transferred back to New Jersey where a plan to release her into the wild went into action. It

wasn't until this year that she was released back to her native habitat in Great Bay. We will be on the lookout to see if ACIJV returns to nest along the edges of GBB as she did in the past.

On another note, we partnered with David Lee Haskins, PhD; Biologist/Postdoctoral Research Associate, US Geological Survey, Eastern Ecological Science Center at Patuxent Research Refuge to collect samples of blood for a study on PFAS. On June 23, when David Lee was in the area we deployed to attempt to capture enough terrapins to meet his quota (12). It was a rainy, cool morning, so we were unsure if any terrapins would come out to nest. After waiting a short while, we found a few terrapins and began to process them. Besides collecting all our data, David Lee also collected blood and for PFAS screening. PFAS is a "forever chemical" which is found in many household products, clothing and food packaging to resist water or stains. We collected a total of 12 terrapins for his research, which also included other field sites in New Jersey, including the Meadowlands, Barnegat Bay and Stone Harbor. We look forward to seeing the results of his research.

LONG BEACH ISLAND FOUNDATION OF ARTS AND SCIENCES (LBIF)

This summer we began to work with terrapins more closely at the Long Beach Island Foundation of the Arts and Sciences which is located in Loveladies, New Jersey. The facility here is located between Long Beach Blvd and the bay, with no hard shoreline in-between. Terrapins have unaltered habitat including open water, saltmarsh and access to upland nesting areas. In addition, there have been several habitat enhancement projects to provide suitable nest sites for terrapins, but many still choose to nest in the gravel parking lot.

This year our field technician encountered a total of 42 terrapins here. Of those, 41 were adults and one was DOR on Long Beach Blvd. One was newly marked and three PIT tagged recaptures were encountered (384.003BA7319C, 384.003BA7315C, 3DD.003BD8E480). At LBIF the average carapace length, width and height were: 198mm, 149.8mm, and 82.5mm. The average weight was 1202.9g. The majority (16) were gravid at the time of capture. Six nests were relocated to one of the turtle gardens on site, which is monitored for hatching and large cages are placed over nests to prevent predation by mammals, like raccoons and red fox.

We hope to continue this island terrapin conservation project to determine how terrapins are utilizing this area for nesting and where other marked terrapins originated from.



CWF Field Technician Victoria R. holds a large adult female terrapin at LBIF. June 2023.



Two terrapins enter the turtle garden on GBB. June 2023.

GARDENING FOR TERRAPINS

This is the fourth season since the establishment of a nesting habitat enhancement site within Great Bay Blvd. WMA. Monitoring of the site has been lead by Cindy Varamo, who has been a devoted WCC volunteer since the 2022 season. This year she conducted her own research project for the Rutgers Environmental Steward Program on our turtle garden. Her goal was “to monitor the use of a habitat enhancement site for Northern diamondback terrapins within Great Bay Blvd. Wildlife Management Area by collecting data on nest occurrence,

location, and outcomes, in relation to distance from nearby vegetation and other features of the site.” Cindy accomplished this by visiting the site several times per week through June and July to identify nests, determine clutch sizes, distance to nearest vegetation, including vegetation type and she would install metal cages over nests to protect them from predators. She also surveyed the garden in August and September to determine outcome of nests.

Overall, 225 were surveyed and contained 2,250 eggs. They were protected with metal cages to reduce predation. 65% of the nests were successful as determined by evidence of no unhatched (dead) eggs that were left within nest cavities. Data collected during monitoring showed that 93% of nests were located near vegetation, which was predominately beach grass and gray sedge. Another 115 nests were found due to predation by red fox. The total number of known nests was 340 with a 33.82% predation rate.

In early October, we met with volunteers and local teachers at the garden to collect hatchling terrapins. They are ones who had not emerged from their nests and will be head-started in Little Egg Harbor Elementary Schools over the winter. We collected a total of 85 hatchlings. They will be notched/PIT tagged with assistance from Dr. Wnek and released in June 2024 where they were collected. This educational initiative is meant to raise awareness for terrapins and their threats in the local community, who we hope will in turn, be terrapin aware.

Lastly, the red fox predation here is highly apparent. Our trail cams captured many photos of fox and their tracks are everywhere. We hope to get assistance from NJDEP Fish & Wildlife to control this predator on site this year.



CWF/WCC Volunteer Cindy Varamo collects data on a terrapin nest within GBB WMA.

In conclusion, staff and volunteers observed 840 terrapins within our project area, including 613 on Great Bay Blvd. this year. Total roadkills observed on GBB was twice as many as last year but closer to the average of 6% from 2012-2022. Motorists observed on GBB appear to be more aware and do stop or take evasive action when encountering a terrapin on the road, but the roadkill rate is not declining. This is likely due to the fact that many roadkills occur at night or in the early morning hours when visibility is reduced. We are not sure how to prevent these fatalities besides closing the road at night for several weeks during summer. We do believe that terrapins are doing quite well in the local area due to our conservation efforts over the past 13 years. We can't thank all of our volunteers who spend countless hours patrolling area roads and monitoring our turtle garden for their time and effort.

Prepared by:

Ben Wurst
Senior Wildlife Biologist
Conserve Wildlife Foundation of NJ
2 Preservation Place
Princeton, NJ 08540
ben.wurst@conservewildlifenj.org



MAPS:

