



CONSERVE WILDLIFE

FOUNDATION OF NEW JERSEY

Great Bay Terrapin Project – 2018 Report SC2018047

Prepared by Ben Wurst, Habitat Program Manager



CHIJOX: A fatally injured adult female terrapin lies on Great Bay Blvd. in Little Egg Harbor, June 28, 2018. She was first encountered and marked on June 10, 2016 and encountered again on June 15, 2017.

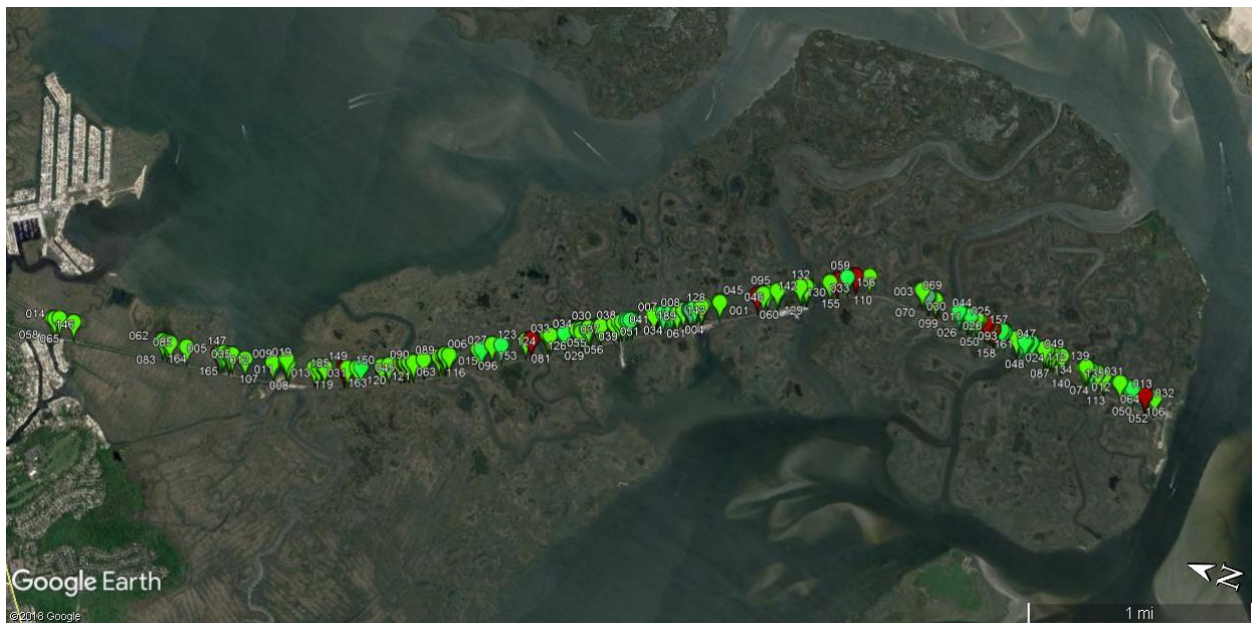
The 2018 nesting season for *N. diamondback* terrapins began during the last week of May, which coincided with the full moon on May 29, 2018. Road patrols were conducted at the beginning of the last week of May and done sporadically to determine when nesting first began. It wasn't until June 1 that we started to see some females begin to nest in our study area and surveys began on June 2. Nesting was slow at first and then picked up as temperatures became warmer (air and water) and the new moon approached.

Purpose of Study:

Since beginning in 2010, the purpose of this project has been to document the number of road kills of adult female Northern diamondback terrapins (*Malaclemys terrapin terrapin*) in Barnegat Bay, Great Bay, and Absecon Bay watersheds (S. Ocean and N. Atlantic Counties). Our main goal is to reduce roadkills of adult female terrapins who are slow to mature and reproduce. A secondary goal is to educate the public about the importance of terrapins within the coastal ecosystem.

Each year Conserve Wildlife Foundation of NJ (CWF) recruits volunteers (Wildlife Conservation Corps) to assist with seasonal road patrols to document the occurrence of terrapins on roads within our project area. While collecting data on the presence of terrapins on roads we also work to protect nesting terrapins from becoming road killed or injured while attempting to cross roadways. We also work 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.

To help better understand how the road impacts the local population, in 2016 we began to notch 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 a total of 471 adult female terrapins over three years on Great Bay Blvd. In 2018 we deployed 100 PIT tags in addition to notching, thanks to Dr. John Wnek, Marine Academy of Technology and Environmental Science (MATES).



Map of terrapin sightings on Great Bay Blvd. in Little Egg Harbor, 2018.

Methods and Materials:

Road surveys are conducted during the terrapin nesting season, from late May through July. This year surveys officially began on June 2, 2018. While driving, the volunteer surveyor or research intern watches for terrapins in the roadway and if one is encountered they pull over and record data on their

observation. 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, Cedar Run Dock Rd, West Creek Dock Rd., Parkertown Dock Rd., S. Green St., Radio Rd., Route 9 (Burlington & Atlantic Counties), and Route 30.



Adult female terrapin on Great Bay Blvd.

Surveys are timed to occur during the day and around the high tide cycle 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. They also record the location using a Garmin GPS and look to see if the individual has been previously captured (notch code). After recording that data, if the terrapin is in a life threatening situation (entering or middle of road, with

vehicle traffic approaching) then they are placed on the opposite side of the road. If the animal is not in a life threatening situation (with no vehicle traffic on road), then it is left to cross on its own. Other area roads were surveyed in the same method. This year we allowed our volunteer surveyors to use the iNaturalist smartphone app to record sightings and submit to our [Great Bay Terrapin Project](#), where we can then download all the data. For Cedar Run Dock Rd., a husband and wife team who live on the road utilize iNaturalist to record sightings of terrapin on the road and around their house.

Surveys by our student research interns are conducted as our volunteer surveyors, but much slower as they collect more data and mark terrapins who are observed on Great Bay Blvd. They record the time, location (using a Garmin handheld GPS), environmental conditions, animal condition, and then measure the terrapin’s carapace length, carapace width, plastron length, and plastron width with a 50 cm Haglof caliper. Each captured terrapin is weighed on a 2,000-gram digital scale. Their scutes are counted and examined for any abnormalities and any previous notch code. Their bodies are palpated to determine if they’re gravid, and they are scanned for a PIT tag. If the animal has not been previously notched, a six-alpha-code is given and filed into their marginal scutes. Codes are chosen by Dr. Wnek and given at the start of the season. Leftover notch codes from the previous year are used first and then new codes next. Data is recorded on a paper data sheet and the terrapin is usually released in less than 10 minutes from when it was captured.

Ocean County	<i>Live</i>	<i>Dead</i>	<i>Total</i>
Cedar Run Dock Rd	229	10	239
Great Bay Blvd	694	57 (6 injured)	757
Other roads	33	10	43
Burlington County			
Route 9	0	3	3
Atlantic County			
Route 30	0	46 (1 injured)	47
Total:	956	126 (+7 inj)	1089



Volunteer student research intern Megan Fielding prepares to capture an adult female terrapin after marking her location with a GPS.

Results and Summary:

The total number of sightings that were collected throughout our project study area were remarkably close to our 2017 results, and data collected on Great Bay Blvd. is consistent with data collected over the past two years. Overall, a total of 1089 sightings (1082 in 2017) were recorded, and of those 126 were roadkilled and 7 were injured (132 in 2017). On Great Bay Blvd. a total of 757 were observed with 57 of those being roadkilled, which is more than double than what we recorded in 2017. On Cedar Run Dock Rd. a total of 239 adult females were observed, where 10 were dead (not all from roadkills, some were found washed up on a shoreline and likely drowned in crab traps). On Route 30, 47 dead terrapins were recorded, with no live sightings at all (1 was injured and taken to Stockton University for care). During a survey of Route 30 we met a local citizen who was also patrolling the road and he had found the injured terrapin which we transported. We had hoped to recruit him to help survey the road but were unable to reach him to follow up. On other roads, most on municipal and county roads in Little Egg Harbor, a total of 46 terrapins were observed and 13 of them were road-killed. Only three roadkills were observed on Route 9 in Burlington County.

Year	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018
# Live Terrapins	547	15	71	1027	913	342	801	737	708	694
# Dead Terrapins	53	9	19	36	38	35	34	46	24	57 (6 inj.)
Total	600	24*	90*	1063	951	377*	835	783	732	757

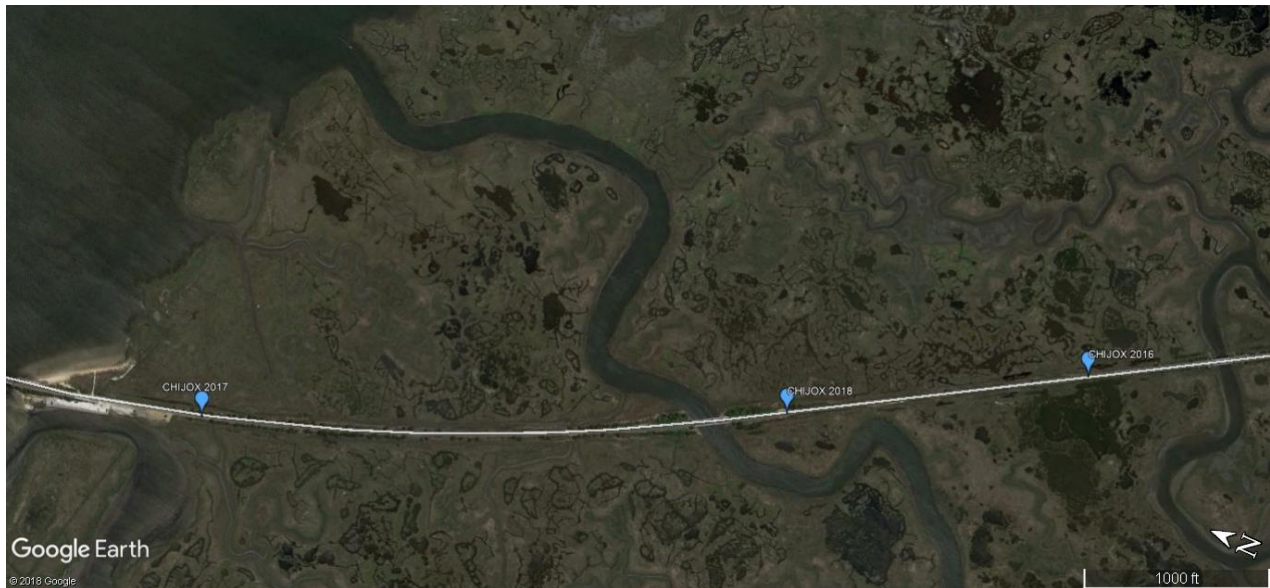
Comparison of Results from Previous Years on Great Bay Boulevard. *Less surveys were performed this year.

This year our research interns collected morphological data from a total of 154 terrapins. All captured this year were all adult females with an average estimated age of 9.88 years old. 39% were gravid when captured. The average carapace length and width was 175.312mm and 135.46mm, which was similar to findings in 2016 (178.679mm and 138.171mm) and 2017 (176.744mm and 137.050mm). Their average weight was 967 grams. Six alpha notch codes were given to 145 terrapins and 100 of those also got a PIT tag for future identification.

	Carapace length (mm)	Carapace width (mm)	Plastron length (mm)	Carapace height (mm)	Weight (g)
<i>Average</i>	175.312	135.46	158.825	72.673	966.948
<i>Std. Dev.</i>	13.23	8.99	17.10	5.85	185.52

Average dimensions and standard deviation in millimeters and weight in grams for 154 captured terrapins on Great Bay Blvd. in 2018.

In 2018 we recaptured a total of thirteen adult females on Great Bay Blvd. who were previously marked or tagged. Of those, one was first notched in 2018 (ACMNOV), five from 2017 (HINOPW, HJOPQX, CHKOPX, HKNPWX, HJKOWX, and five from 2016 (**CHIJOX***, CHKNPV, CHIKOP, CHIOQV, **CHIO PQ***), and two we have no record of (LHKOPQ, CIJKPQ) but are checking with colleagues to identify them (***DEAD**). Notable findings include HKNPWX, who was found 3.86 miles from where she was originally captured, and CHIJOX (pictured on first page, map below) who was notched in 2016, re-sighted in 2017, and found to be critically injured in 2018.



Locations where CHIJOX was encountered on Great Bay Blvd. in Little Egg Harbor from 2016-2018.

In conclusion, we believe that this project has helped engage the local community and visitors to the region in the conservation of northern diamondback terrapins. As we approach our 10 year anniversary, we seek to understand the dynamics of human-wildlife use of the road to help determine how best we devote our resources. We began this project with a goal of recruiting local residents to help us collect data and educate others about terrapins and their importance in the ecosystem. Even though the mortality rate increased to the highest level since 2014, we still believe that most people who travel on

the road stop or avoid hitting a terrapin. With that said, there are a few who we believe intentionally hit terrapins on roads. For example, on the morning of June 12, while we were working on Great Bay Blvd, there were two fresh (less than 30 minutes apart) roadkills within 500 feet of each other. They were both right before the first commercial business (marina) on the road and on the same day that there was a delivery of bait to marinas. We're hopeful that more people who travel on coastal roads during the summer will slow down and allow these sensitive animals to complete their life cycle. In 2019 we will consider the use of a short survey to give the public who enter Great Bay Blvd. Wildlife Management Area to gain more insight into the awareness of terrapins by motorists.



Roadkills which occurred within a half hour on the morning of June 12, 2018 on Great Bay Blvd. in Little Egg Harbor, NJ.

We are looking forward to working with NJ Fish & Wildlife to enhance nesting habitat for terrapins off Great Bay Blvd. at a former marina in 2019. We'd like to thank our volunteer student interns, Megan and Marissa for all of their hard work in 2018! They devoted more than 100 hours towards the project and did a great job with collecting accurate data. We'd also like to thank our faithful volunteers, who dedicate valuable time to help ensure adult female terrapins can safely access and exit breeding grounds inside Great Bay Blvd WMA.

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** Note: Raw data submitted to NJDEP, NJDFW Wildlife Permits Unit and ENSP.*



Map of terrapin sightings on Great Bay Blvd., Little Egg Harbor, Ocean County, NJ.



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Map of terrapin sightings on Great Bay Blvd., Little Egg Harbor, Ocean County, NJ.



Map depicting terrapin sightings on Route 30 in Atlantic County, NJ.