



CONSERVE WILDLIFE
FOUNDATION OF NEW JERSEY

2017 Great Bay Terrapin Project Report - Permit # SC2017018

January 22, 2018



Purpose of Study:

The purpose of this project is to reduce the amount of road kills of adult female Northern diamondback terrapins (*Malaclemys terrapin terrapin*) in the Barnegat Bay, Great Bay, and Absecon Watersheds (Ocean and Atlantic Counties). 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. 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 for terrapins by ensuring the installation of X-ING signs on roads with high use by terrapins.

During the nesting season, from May through July, our team of volunteers conduct surveys of roads using a motor vehicle. The surveyor drives a route and looks for terrapins in the roadway. If and when they encounter a live, injured or dead terrapin, they stop and collect data on the observation. Lastly, conserving breeding age adult females is the main goal of this conservation project, and we hope that data collected can be used to help shed light on the overall health of the local population.

Methods and Materials:

This year we continued to notch the marginal scutes of adults found on the road for a long-term mark and recapture study. Two student research interns were recruited to assist with the mark-recapture work on Great Bay Blvd. They worked in shifts to help cover more time when terrapins were actively nesting. This year over 200 adult terrapins were notched.



A female terrapin is being measured by CWF research interns.

Road surveys were conducted daily, beginning on June 5th and ending on July 18th between the hours of 0700-1700. Volunteers traveled the length of Great Bay Blvd (approx. 5 miles long) to the end and back. Other area roads were surveyed in the same method. The timing of surveys is focused around high tide, especially during spring tide events, when terrapins are more actively seeking nest sites. When a terrapin is encountered on the road or road shoulder, the surveyor



Terrapin with newly assigned notch code.

marks a GPS point and notes the condition of the terrapin (live, dead or injured). They also check for any previous notch codes in the marginal scutes and note it on a datasheet. One to two volunteers covered Great Bay Blvd. during the day, sometimes overlapping with one of our research interns.

Our research interns conducted surveys in a similar fashion by driving up and down Great Bay Boulevard, but they collected more data on the terrapins that they encountered on or near the road. They recorded the time, location, animal condition (live, injured, or dead), and then measured the terrapins carapace length, carapace width, plastron length, and plastron width with a 50 cm Haglof caliper. Each captured terrapin was also weighed on a 2,000-gram digital scale.

Other noted variables include environmental conditions including, air temperature, humidity, and tidal stage, as well as the estimated age, gravidity, and scute number (marginal, costal, and vertebral) of the individual. Each terrapin was checked for previous identification (PIT tag or notch code). If the individual did not have a PIT or existing notches, a unique 6-letter identification code was assigned and notched into the carapace using a V shaped metal file. Terrapins were photographed alongside their alpha-code and released where they were found or in the direction they were headed within 8-15 minutes of their capture time.

All locations were determined using a Garmin GPS or personal smartphone using the iNaturalist application. Any points that were not accurate were removed. If injured terrapins were encountered, they were transported to the Wetlands Institute in Stone Harbor or Stockton University for treatment and care. On Great Bay Blvd. dead terrapins were marked using orange spray paint by making an X shape on the road. The remains were left on the road this year to help bring more awareness to motorists on the roadway. In 2018 we are planning mark the roadway with a numerical code and paint that will last longer.

Ocean County	<i>Live</i>	<i>Dead</i>	<i>Total</i>
Route 72	0	1	1
Cedar Run Dock Rd	241	4	245
West Creek Dock Rd	0	0	0
Great Bay Blvd	708	24	732
Other roads	1	2	3
Burlington County			
Route 9	0	3	3
Other roads	0	1	1
Atlantic County			
Route 30	0	95	95
Route 9	0	1	1
Other Roads	0	1	1
Total:	950	132	1082

Summary of terrapin sightings on road patrolled in 2017.

Great Bay Blvd. continues to be our priority focus for research and conservation of adult female terrapins, with Route 30 becoming more of a priority as we collect more data over time. All other sightings occurred throughout S. Ocean County, southeastern Burlington County (Bass River Twp.) and Atlantic County.

From June 3 to July 18, we collected a total of 1082 terrapin sightings. Of those, a total of 132 were found dead on a roadway for an average road mortality rate of 12.2% throughout the entire survey area.

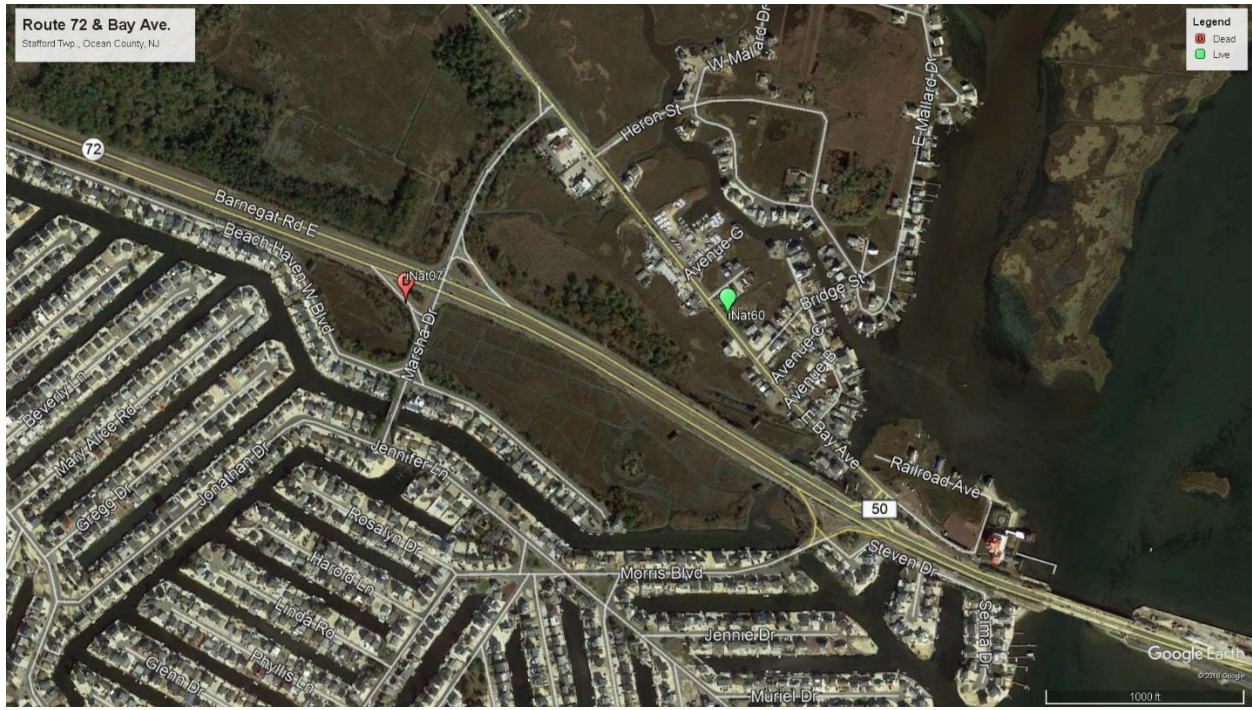
Re-sightings:

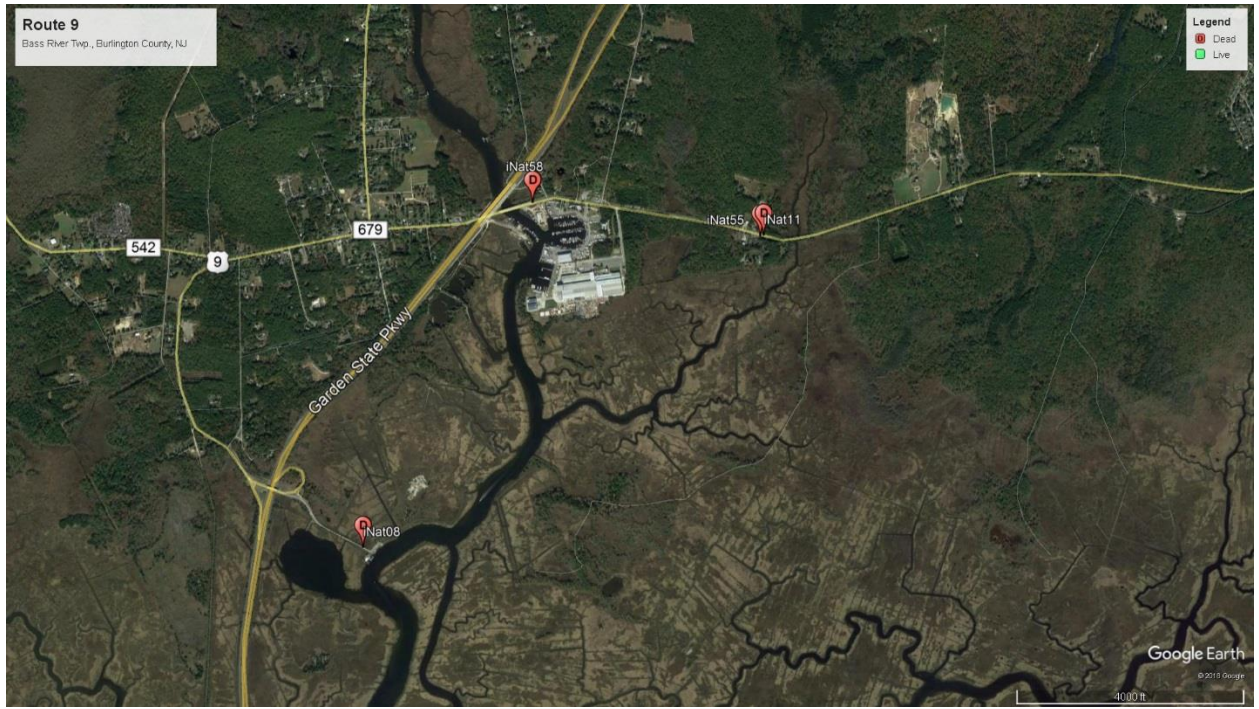
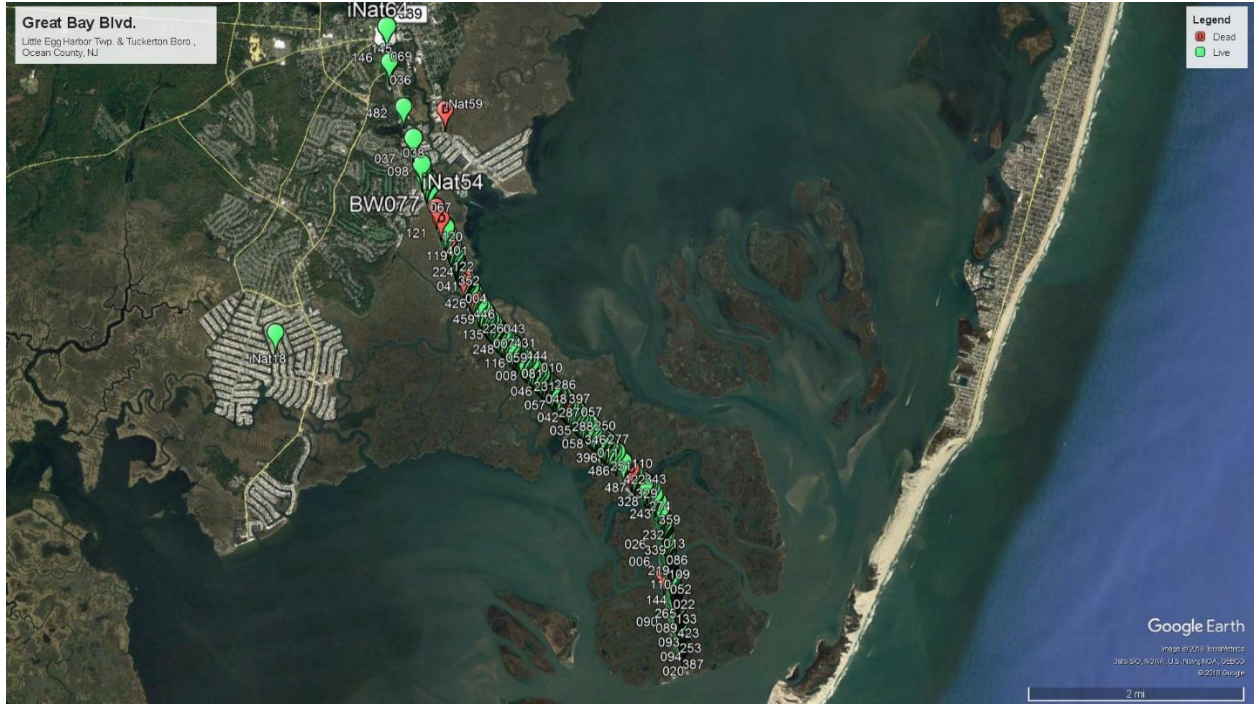
This year a total of seven adult female terrapins were re-sighted on Great Bay Blvd this year. Four were notched this year (CHIVOQ, HJOVWX, HJKPQX, HIOPXW), two in 2016 (CHIKVW, CHIJOX), and one in 2008 during a study conducted by a Drexel

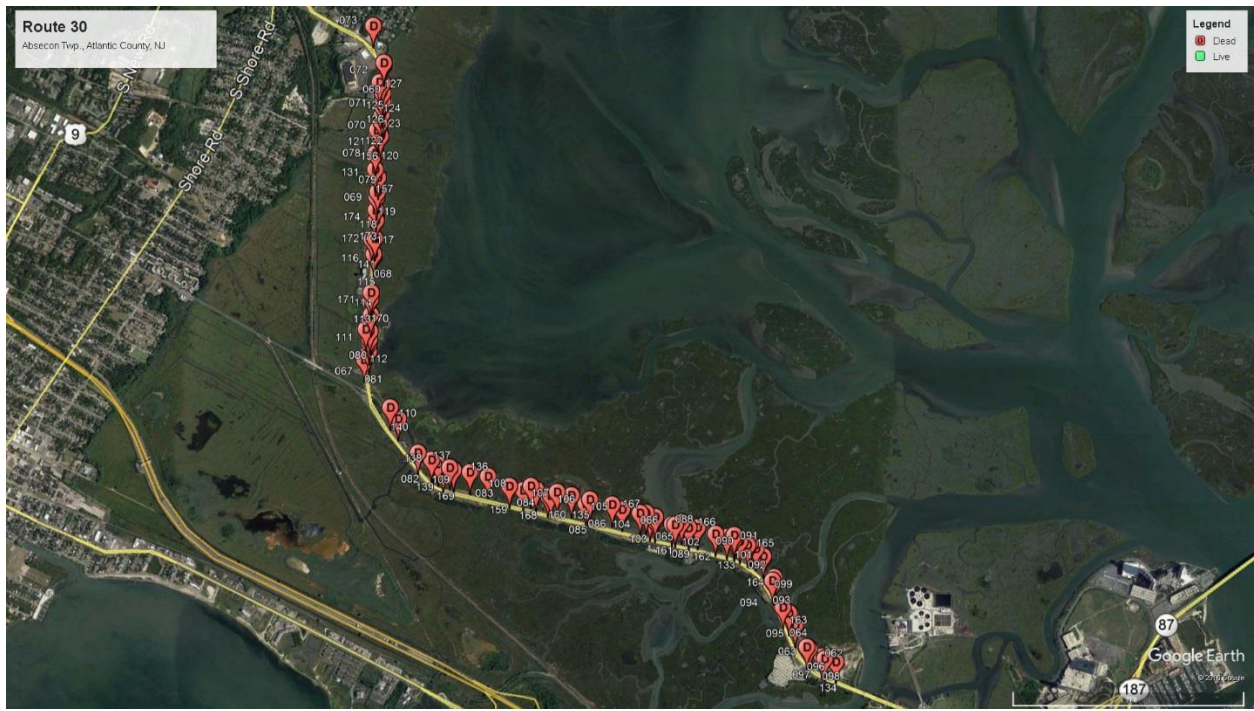
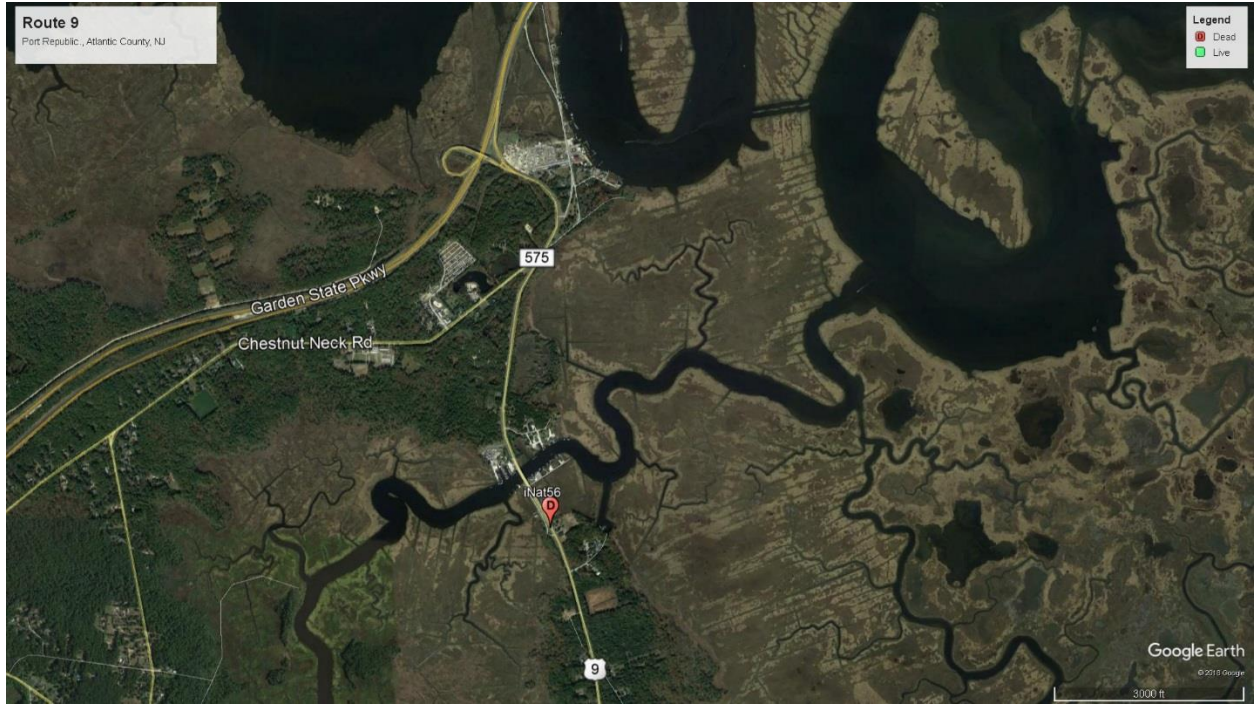
University student (BIKNV). No PIT tags were scanned in 2017.

Maps:

Below are maps which depict all sightings within the different areas that we patrol. Raw data from these sightings will be submitted to ENSP through a bulk data import form for input into Biotics. *Green icons = live terrapins. Red = dead terrapins.*









Female terrapin nests in an area that was previously degraded by excessive motor vehicle use.

Results and Summary:

The research conducted as a part of this project is necessary to determine how long term road mortality is affecting the local population. As we’ve noted in the past, previous studies within Great Bay Blvd. WMA have found that adult females are smaller and less numerous (Avisar 2006). Over time, the data collected as a part of this project will help determine the overall size and health of the population. Data can also be used to help determine the overall effectiveness of local awareness and education efforts associated with this project.

Morphological data was collected from a total of 212 terrapins by our research interns. The majority measured were adult females (a couple were juveniles), and 55% were gravid when captured. Average carapace length and width was 176.744mm and 137.050mm as compared to 178.679mm and 138.171mm in 2016. Average sizes and weights of adult females are within the normal range since we began measuring adult females in the last several years.

	Carapace length (mm)	Carapace width (mm)	Plastron length (mm)	Carapace height (mm)	Weight (g)
<i>Average</i>	176.744	137.050	159.114	77.225	1000.227
<i>Std. Dev.</i>	17.88	14.50	17.10	80.33	228.58

Average dimensions and standard deviation in millimeters and weight in grams for 212 captured terrapins on Great Bay Blvd. in 2017.



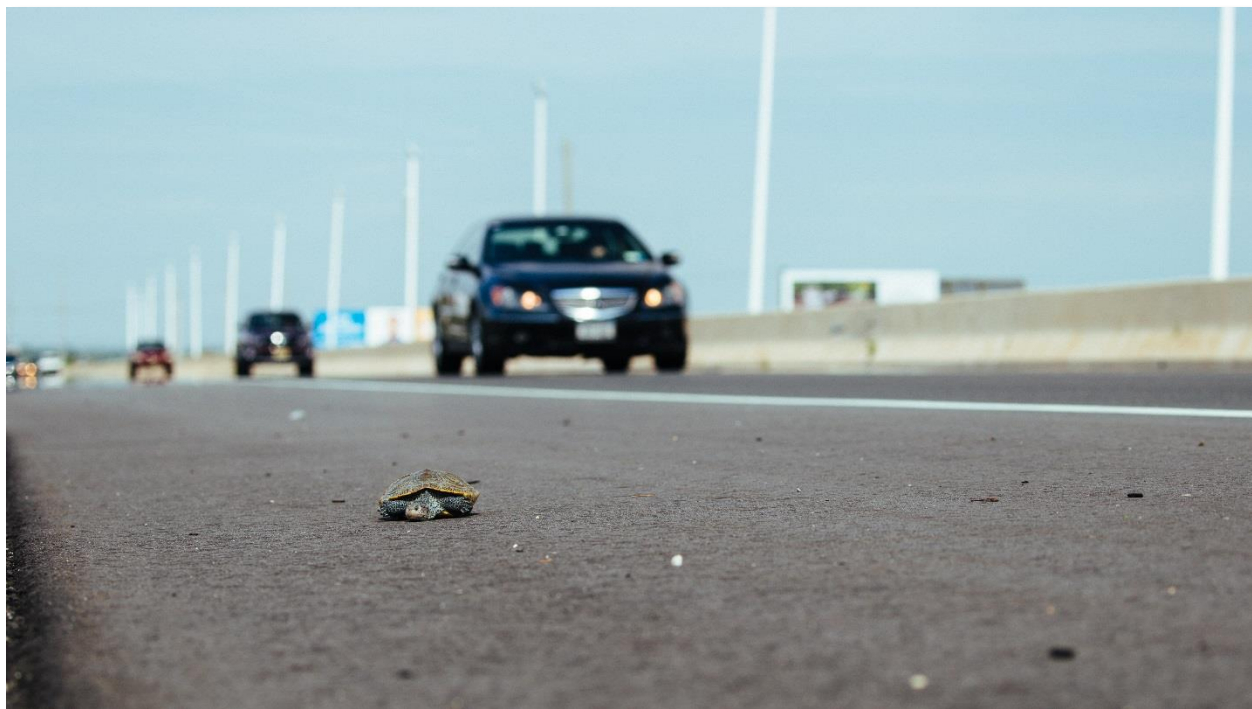
MATES/Project Terrapin interns measure the carapace height of an adult female terrapin on GBB.

Overall, the impacts of this project on terrapins and the surrounding habitat have been positive. We managed to reduce road mortality rates to less 5% over the past eight years as compared to 8.83% observed in 2004-05 (Szerlag 2006).

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

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

In 2017 our dedicated volunteers patrolled for more than 400 hours and traveled over 3,500 miles. A total of 732 northern diamondback terrapins on Great Bay Boulevard and another 350 on other roads. A total 24 were found dead. The number of terrapins observed this year was slightly higher than last year, but with less road kills. On Cedar Run Dock Road, two local residents patrol their road and record sightings of terrapins on the road and in their yard. This year they recorded a total of 245 with 4 being dead on the road (down from 307-live and 6-dead in 2016). We are actively working to source funding from the USFWS Partners Program to enhance nesting habitat for terrapins that utilize their backyard. We surveyed Route 30 four times in 2017, from June 12 to July 11. There we recorded a total of 95 road kills. Given the design of the road and speed limit, the mortality rate of adult female terrapins who enter this roadway is almost 100%.



As we've mentioned in previous reports, female-biased mortality will likely cause the population in Absecon Bay to become diminished, since terrapin traits include low recruitment, delayed maturity, long life, and limited dispersal (Haramis 2011). We continue to share this data with NJDOT staff and are investigating the benefits of using dredge materials (sand) to create high marsh areas away from busy roadways. However, since terrapins have very high levels of site fidelity, barriers would still be needed to prevent female terrapins from entering roadways where they have historically nested along their shoulders. To help enhance what nesting habitat is left in the area, we held a shoreline cleanup of a heavily used (and abused) public access area, which contains suitable habitat for terrapins to nest, on Absecon Bay. By removing the trash and debris and controlling public access (DOT limiting vehicles from accessing the site) we hope that this can be a step in the right direction for sustaining the Absecon Bay terrapin population.

In conclusion, we are thankful for the dedication of our volunteers and student research interns who contribute a large amount of time and energy to ensuring that terrapins survive to nest. With the least amount of road kills observed this year since 2011, it goes to show that these conservation efforts are paying off. As we look forward to another year of working to reduce road kills of adult female terrapins, we hope to broaden our focus to addressing the need for enhancing suitable habitat to help lure female terrapins away from busy roadways. We are thankful for all of the support and guidance that we receive from our partners, volunteers, and donors who support this project.

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