CONSERVE WILDLIFE

FOUNDATION OF NEW JERSEY

Great Bay Terrapin Project – 2019 Report SC2019041

Prepared by Ben Wurst, Habitat Program Manager

Great Bay Terrapin Project 2019 Student Research Intern Gabi Arcadi marks marginal scutes that will be notched for future identification of this adult female northern diamondback terrapin.

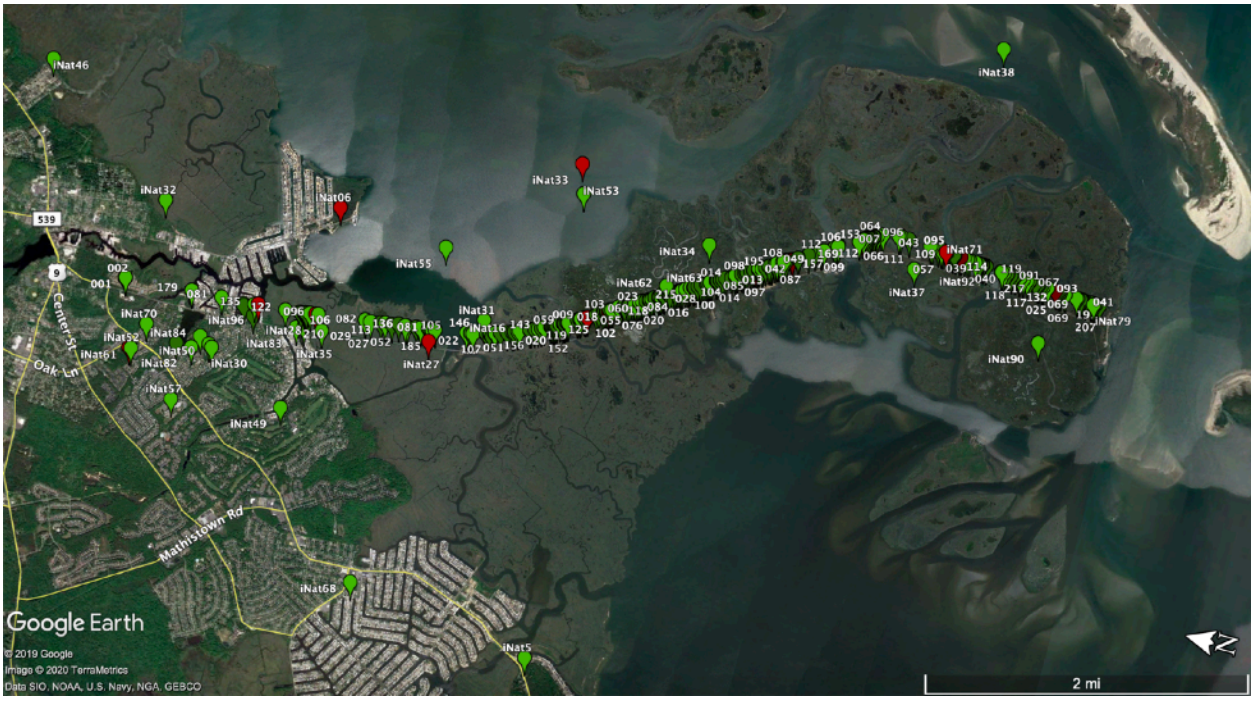
Nesting of adult female N. Diamondback terrapins began in late May. The first female observed on Great Bay Blvd. was on May 29. The first road kill was found two days later. This first wave of nesting occurred during the new moon lunar phase, which was on June 3. Daytime water temperatures around noon were around 70º F. Road patrols and surveys began on May 31 and continued until July 10, when nesting subsided. Overall, our volunteers recorded a total of 697 terrapins throughout the project area. Of those 81 were found dead on roads.

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, SE Burlington 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. Our final goal is to identify and enhance nesting habitat for adult females to nest.

Each year Conserve Wildlife Foundation of NJ (CWF) recruits volunteers (NJDFW-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 these nesting female 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 704 adult female terrapins over four years on Great Bay Blvd.



Map of terrapin sightings on Great Bay Blvd. and surrounding roads in Little Egg Harbor/Great Bay watershed, 2019. Note: You can see how some observations from volunteers using a smartphone app called iNaturalist are not accurate.

Methods and Materials:

Road surveys are conducted during the terrapin nesting season, from late May through July. This year surveys officially began on May 31, 2019. 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.

The race is on. Two adult female terrapins cross Great Bay Blvd. Some days, there are more terrapins than cars on the road.

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 are surveyed in the same method.

In 2019 we continued to test the use of a smartphone application called iNaturalist where sightings are added to our project: Great Bay Terrapin Project. This is also a way for the public to submit their own sightings to contribute to the project while not being an official volunteer. While some data can be very accurate for some users, others it is not (as shown in the map on page 2). We hope to determine why this is the case and make sure all data is accurate in 2020.

Great Bay Terrapin Project Student Research Intern Emily Hendrickson measures the carapace height of an adult female terrapin on GBB.

In addition, after downloading GPS data, we determined that our old GPS units are not supported and did not record the correct time and date of the waypoint. Obtaining time/date data with GPS points helps to ensure data collected is accurate.

Surveys by our student research interns are conducted as our volunteer surveyors, but much slower as they collect morphometric 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 their carapace length/width, plastron length/ width with a 50 cm Haglof caliper. Each captured terrapin is weighed on a 2,000-gram digital scale. Their scutes (marginal, costal, and vertebral) 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 provided to us 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	Live	Dead	Total
Cedar Run Dock Rd	188	4	192
Great Bay Blvd	417	48	465
Other roads	11	7	18
Burlington County			
Route 9	0	1	1
Atlantic County			
Route 9	0	2	2
Route 30	0	19	19
Total:	616	81	697

Results and Summary:

The total number of sightings that were collected throughout our project study area were below what was recorded in 2017-2018. Overall a total of 697 terrapins were observed. Of those, a total of 81 were found dead. On Great Bay Blvd. a total of 417 were found live and 48 dead. A total of 192 terrapins were recorded on Cedar Run Dock Rd., which is slightly less than what was recorded in 2017 and 2018. On Route 30 we only conducted one survey and found a total of 19 dead terrapins. Other roads account for only a small portion of sightings where 11 were found live and 10 were dead.

Terrapins encountered on Great Bay Blvd. from 2012 to 2019. 2005 is provided as a reference from previous research conducted on road occurrence by S. Egger. * indicates years with reduced surveys.

Year	2005	2012	2013	2014	2015	2016	2017	2018	2019
# Live Terrapins	547	1027	913	342	801	737	708	694	417
# Dead Terrapins	53	36	38	35	34	46	24	57 (6 inj.)	48
Total	600	1063	951	377*	835	783	732	757	465*

In 2019 our student research interns collected morphological data from a remarkable number of 255 terrapins. All captured this year were adult females with an average estimated age of 8 years old. 55% were gravid when captured. The average carapace length and width was 175.4mm and 134.4mm. Their average weight was 938.2 grams. A total of 233 terrapins were new captures and given a unique identification notch code for future identification.

	Carapace length (mm)	Carapace width (mm)	Plastron length (mm)	Carapace height (mm)	Weight (g)
Average	175.4	134.4	157.8	75.5	938.2
Std Dev.	11.7	12.4	15.0	40.0	202.7

Our interns and volunteers recaptured a total of 24 different adult terrapins who were previously captured and marked. The oldest terrapins recaptured (BJKNV and CHOQV, who was recaptured twice on June 11) were marked in 2008 on Great Bay Blvd. by Drexel University researchers. Four terrapins were notched in 2016 (CHIKPW, CHIKPV, CHIJKN, CHIJNP) were recaptured, two from 2017 (HJKNPX, HINOPW) and nine from 2018 (ACKMPX, ACMQVW, ACJMQX, NOPQVX, ACKMPV, ACKMNW, ACMNOW, IJKNPW, IJNOQV) We also recaptured five (BHMOQW, ACMVWX x2, BHKMPW, BHJMNO, BHKMNX) who were marked this year. There were two that we marked that could not be identified (985-120028654492 & CHMNWX). Lastly, a notable recapture this year (but not on GBB) was of ACIJV. She was originally captured and marked in 2008 by Drexel University researchers and recaptured by our staff in 2013. This fall she was purchased at a reptile expo in Maine. It wasn't until she was brought to a veterinarian for care and she was scanned for a PIT tag. That electronic tag linked her back to Great Bay Blvd where she was taken from the wild and sold as a pet.

In summary, the total number of terrapins observed this year during summer surveys and patrols was down from 2018 and 2017 results. This is likely due to reduced surveys/patrols by our volunteers as compared to previous years and not the overall abundance of terrapins in the

area. The average road mortality rate was the highest ever recorded in the history of this project at 10%. This is despite the presence of Little Egg Harbor Township Police Department, who were observed conducting their own patrols of the road at least twice a day during the nesting season. They would stop and help move every terrapin that they encountered on GBB.

Accuracy of all data collected by our volunteers for this project continues to be questionable, especially for road killed terrapins. Since many people travel along the public road during summer months, some people may remove injured (for hopeful care) or dead terrapins off the roadway (this has been witnessed in previous years on GBB). Other road killed terrapins may be counted twice, if not removed from the roadway. We previously marked roadkills with an X on the road until vandals used spray paint to write on GBB which caused the public to point blame at this project. We plan to better educate our volunteers on collecting accurate data and will conduct more local outreach to ensure the public is aware of this Project and learn how they can help.

ACIJV in hand on GBB in 2013.

The site of our 1/2 acre habitat enhancement project inside Great Bay Blvd. WMA. November 2019.

Anyone who drives on coastal salt marsh access roads or causeways to barrier islands can tell you, it is easy to spot a terrapin on a road. While it may be difficult to avoid or stop and assist them on some highways, we believe that there is no excuse for hitting a terrapin on roads like Great Bay Blvd. As we begin a large scale habitat enhancement project in partnership with NJ Division of Fish & Wildlife, we will be working with our State and local partners to determine ways that they can help us to make more drivers aware of terrapins in a state Wildlife Management Area.

A big focus of our work moving forward, as we move into more habitat enhancement projects, will be to watch for poachers who may be taking adults or eggs from our project area. With the news of the adult terrapin bought in Maine and 3,500 hatchlings confiscated in Pennsylvania (that originated from GBB) we know that this is an ongoing problem (wildlife poaching/trafficking) that is likely to get worse. The last thing we want is to create an easily accessible area for poachers to target these animals for profit.

We won't be successful without public support. That is one thing that we've seen grow over the years and can only hope that the public will help protect their precious natural resources for future generations to admire.

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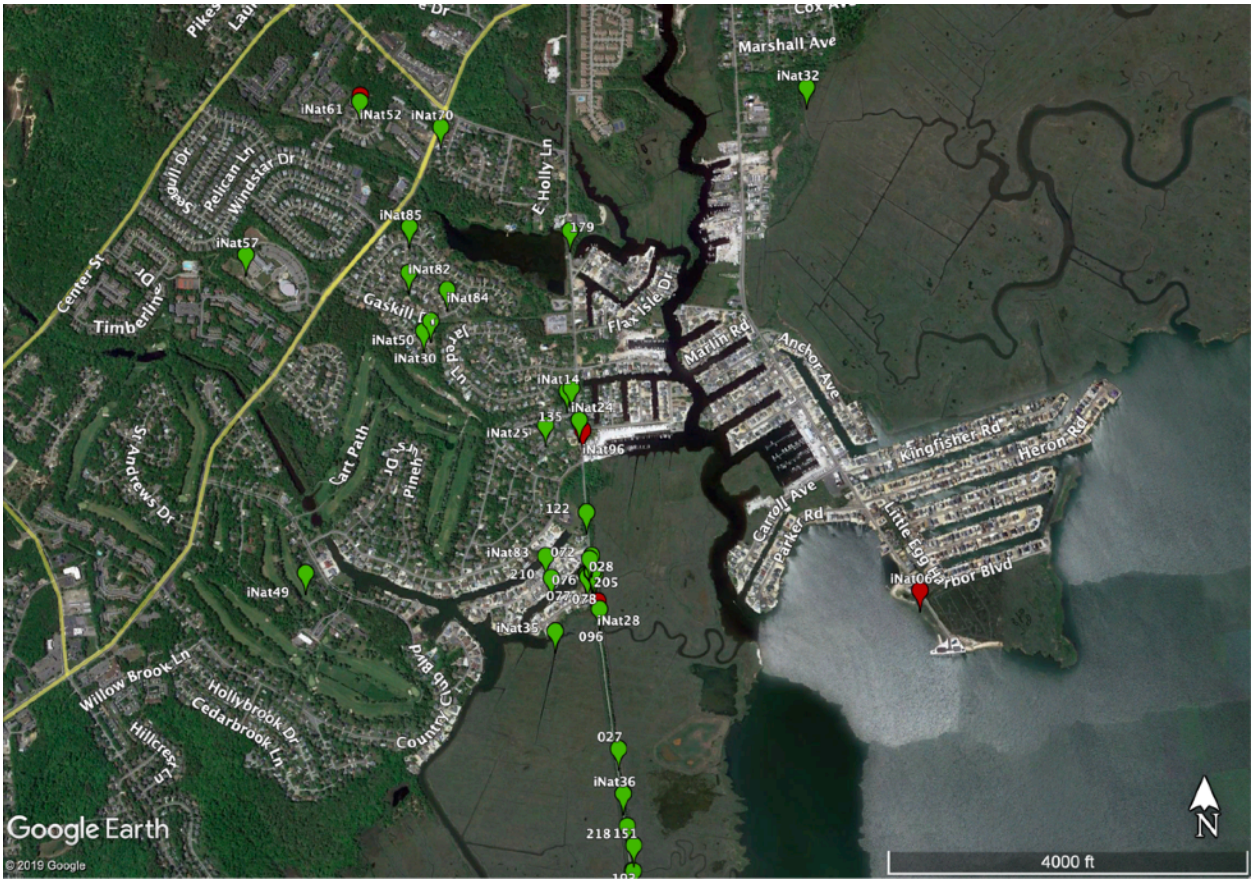
* Note: Raw data submitted to NJDEP-NJDFW Wildlife Permits Unit and ENSP.

Maps:

Route 72

Cedar Run Dock Rd.

West Creek Dock Rd.



Great Bay Blvd.

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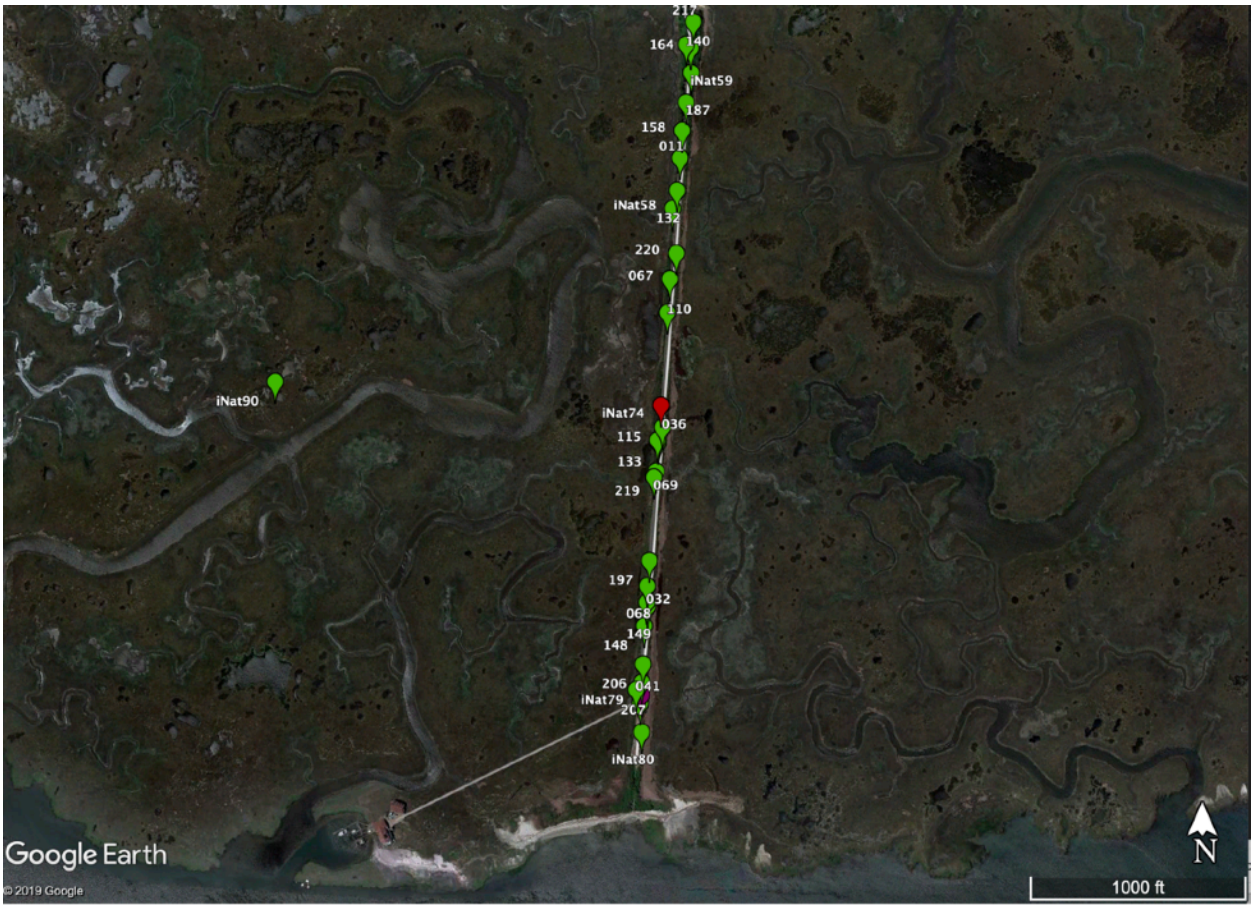

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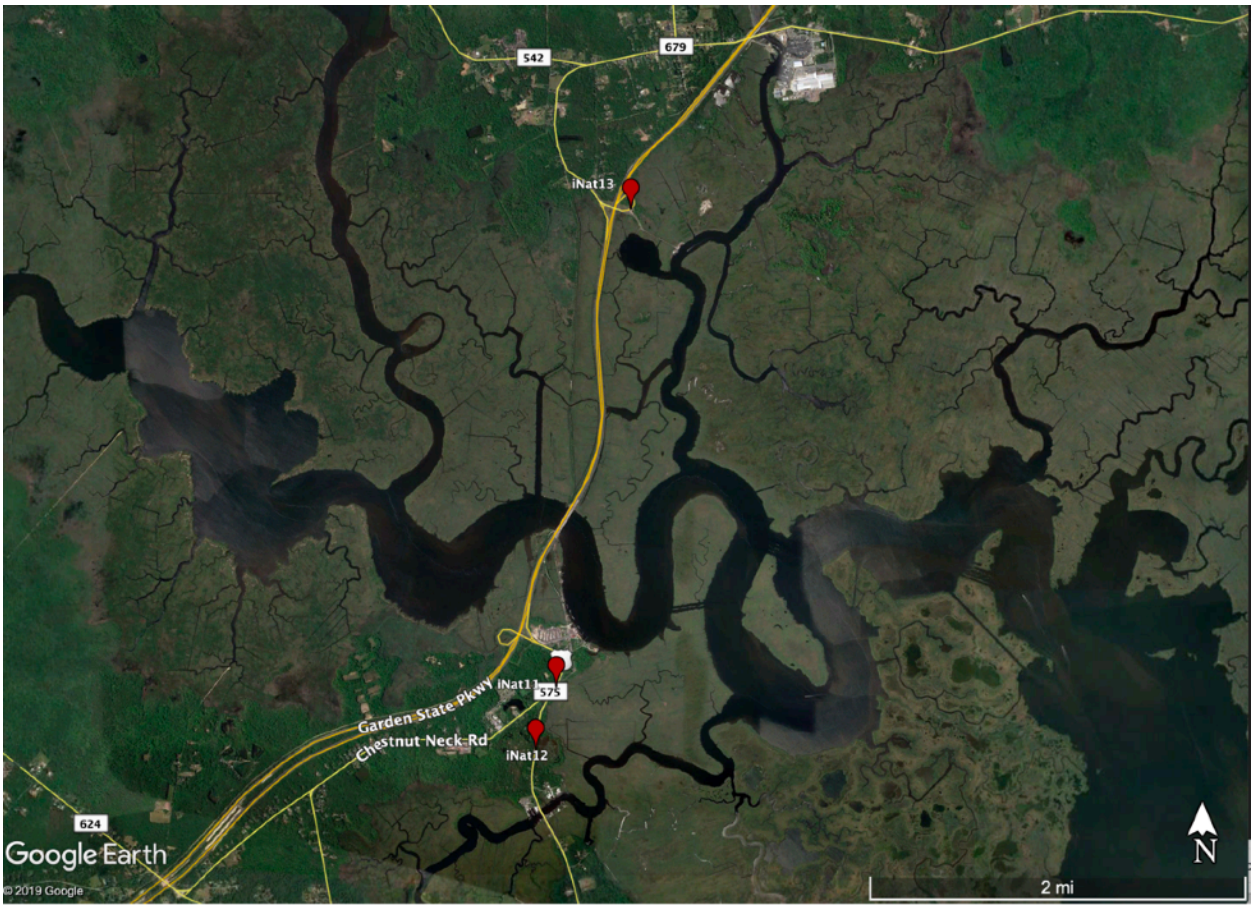
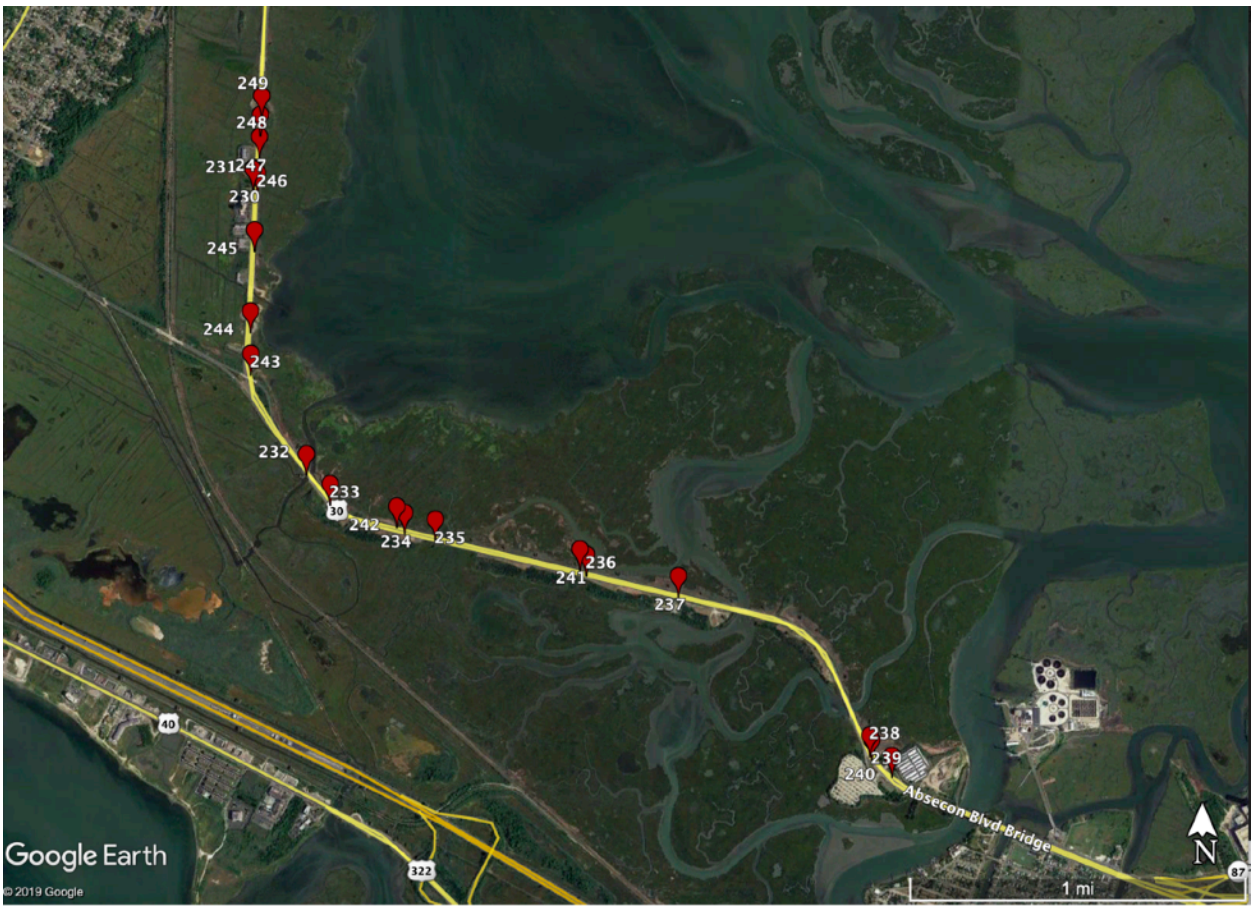


Route 9. Burlington & Atlantic Counties.



Route 30. Atlantic County.