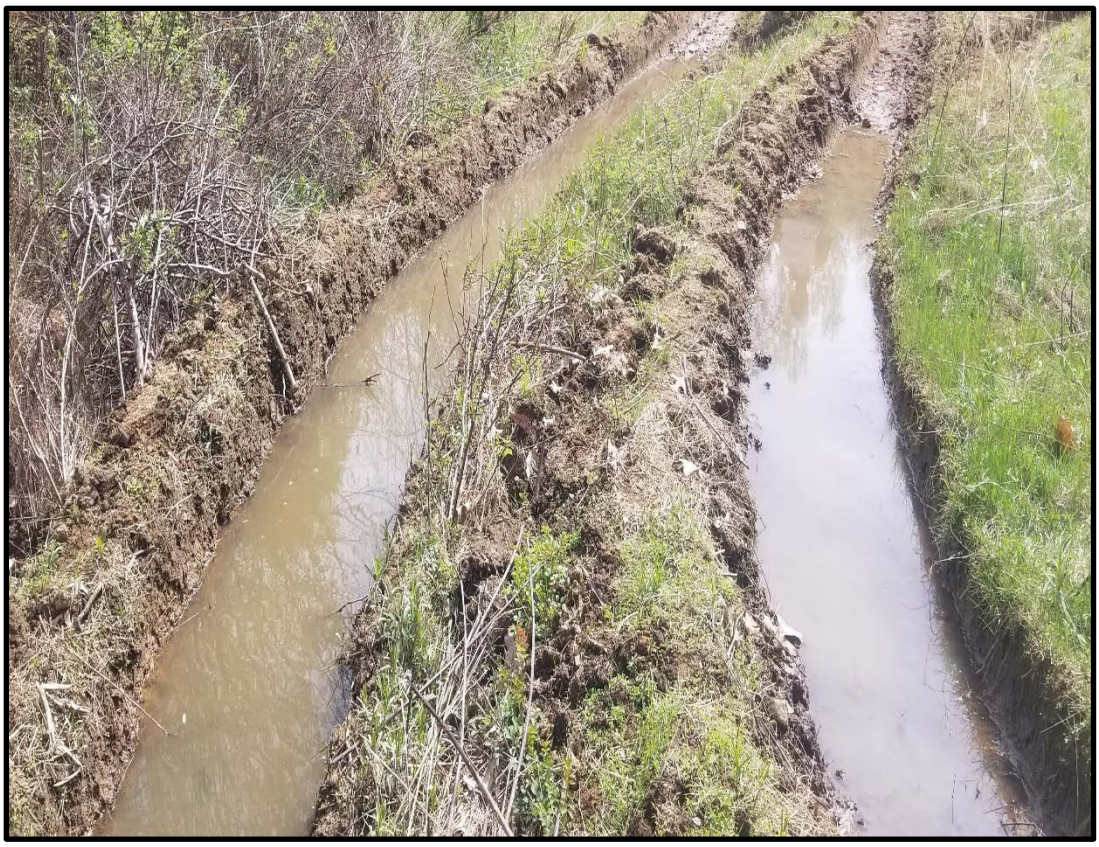
Mosquito Breeding Habitat Survey

Sea Girt National Guard Training Center

August 2019



Prepared by:

John Hallagan – SUEIP Program Manager

Stockton University Environmental Internship Program (SUEIP)

School of Natural Science and Mathematics (NAMS)

Stockton University, 101 Vera King Farris Drive

Galloway, NJ 08205

SUEIP Project Faculty Advisor: Tait Chirenje

Introduction

As described in the New Jersey Army National Guard (NJARNG) Integrated Pest Management Plan (IPMP), the Environmental Management Bureau is responsible for managing the pest management practices at NJARNG facilities, in compliance with all applicable local, state, and federal laws. This includes plans for pesticide application, rodent control, insect control, and nonnative plant control. This survey report focuses on efforts to identify and eliminate mosquito breeding habitat at the Sea Girt National Guard Training Center (NGTC). Mosquito-borne diseases, such as Zika and West Nile Viruses, are a threat to site personnel as well as visitors utilizing the beach area, camping facilities, sports fields, or visiting the museum.

At the Sea Girt NGTC, mosquito trapping and surveillance is conducted by the Monmouth County Mosquito Control Division. This division traps mosquitos to monitor for pathogens such as West Nile Virus (WNV), St. Louis Encephalitis Virus (SLEV), Jamestown Canyon Virus (JCV), Eastern Equine Encephalitis Virus (EEEV), and Zika Virus. Results are provided to the NJ DMAVA (Department of Military and Veterans Affairs) EMB (Environmental Management Bureau). Mosquitoes trapped on 8/6/2019 and 8/13/2019 tested positive for WNV. In response to these results, the EMB has tasked the Stockton University Environmental Internship Program (SUEIP) with locating all potential mosquito breeding habitat on the Sea Girt NGTC property. Potential breeding habitat includes any area that could contain standing water, including roadside ditches, puddles, depressions, buckets, tires, etc. Methods for this survey are described below. This is part of an ongoing survey effort that will be used to not only address breeding habitats on a seasonal basis, but monitor breeding habitat availability over time. Data from the 2019 survey season has been added to a dataset created in 2018, and will be part of an ongoing long-term monitoring effort.

Aside from pest management practices, this project has climate change adaptation implications as well. Currently in New Jersey, mosquitos are most active from April to November. However, there is growing concern that a warming climate could extend that season. According to the CDC, a longer breeding season could result in an increased risk of vector-borne diseases. A warmer climate could also provide the conditions necessary for warm climate species of mosquitoes not endemic to the area to survive and persist, such as the Aedes aegypti, a Zika Virus carrying species. Long term monitoring is crucial to understanding trends and changes in the mosquito populations at this site, and to identify any correlations between:

A. Mosquito population density
B. Available potential breeding habitat
C. The introduction/presence of non-endemic species
D. Climate change

Methods

1. Drive and/or walk the entire Sea Girt NGTC to identify potential mosquito breeding habitat
2. Mark the location of all potential mosquito breeding habitat with a GPS
3. Record in a notebook or on a datasheet:
    a. Location ID/Number

    b. Standing Water Present?
    c. Mosquito Larvae Present?
    d. Description (Roadside ditch, field puddle/depression, bucket, tire, storm basin, etc.)
4. Use GPS points to develop a PDF map, showing all potential mosquito breeding habitat
5. Enter notes into database
6. Provide the EMB with a survey summary, including methods, results, maps, and recommended action plans

Materials

- Notebook
- GPS Unit
- Camera
- Pens, Pencils

Results

On 8/29/2019, the Sea Girt NGTC property was surveyed by SUEIP and EMB staff. In total, 49 potential breeding habitat locations were marked. Figure SG1 shows the location of these points. Of the 49 locations, 16 contained standing water. The remaining 33 locations were either dry or damp. Mosquito larvae were not identified in any of the potential breeding habitats. Table SG1 contains the survey results.

This is an increase of 13 potential breeding locations from the 36 locations documented in 2018. However, 27 of the locations identified in 2018 were not identified as potential breeding habitat in the 2019 survey, suggesting that many of these locations have been successfully eliminated. Figure SG2 shows the locations potential breeding habitats identified during both the 2018 and 2019 surveys.

Recommendations

In an attempt to minimize the mosquito population at this site, the following actions are recommended:

For depressions along roadsides

- Fill in depressions with fill dirt and/or gravel
- Prohibit parking along roadsides – limit parking to graveled parking lots

For depressions in fields

- Fill in depressions

For depressions in pavement

- No action necessary. Standing water in pavement will likely evaporate before mosquito larvae can emerge

For stormwater basins

- Determine the cause of the standing water. Basins should drain naturally
- Treat basins with a sustained-release larvicide, such as the Bactimos Mosquito Control Dunk, Model MD541 (follow link below). One dunk is expected to treat the surface of a 100 sq. ft water body for approximately 6-8 weeks. Treatment would need to be repeated every 6-8 weeks during the mosquito breeding season. https://www.amazon.com/Bactimos-Mosquito-Control-Dunks-dunks/dp/B00461QTL8/ref=pd_lpo_sbs_86_img_1/145-5051593-8347919?_encoding=UTF8&psc=1&refRID=H5Y4164G2RJX2C0J8HY2#feature-bullets-btf

Other recommended actions

- Keep buckets and cans upside down. Upright buckets and cans can collect rainwater
- Keep used tires inside, or properly dispose of them
- Drill holes in the bottom of any tires, containers, etc. that must remain outside
- Revisit all documented potential breeding habitat after action plans have been implemented. Document any remaining potential breeding habitat
- Continue to monitor the mosquito population on-site
- Survey the site for potential breeding habitat every spring and fall (start and end of mosquito season)
- Compile all mosquito trapping and mosquito habitat data into a long-term database
- Track changes in mosquito populations over time (density and species)
- Identify any correlations between population density, species, available/potential breeding habitat, and climate changes
- Post signage at site entrance, camping area, beach area, and on building bulletin boards, containing recommended mosquito bite prevention methods, as described in Appendix K of the IPMP.

References

U.S. Department of Health and Human Services Centers for Disease Control and Prevention, American Public Health Association, 2019. “Climate change increases the number and geographic range of disease-carrying insects and ticks.”
https://www.cdc.gov/climateandhealth/pubs/vector-borne-disease-final_508.pdf

New Jersey Army National Guard Integrated Pest Management Plan, 2013.

Table SG1
Site: Sea Girt
Date: 8/29/2019
Surveyors Present: Sarah Helble, John Hallagan, Alexandria Petrosh, Nick Cordivari, Steven Hoffman

Potential Breeding Habitat Number (As recorded on the GPS)	**Standing Water Present?**	**Mosquito Larvae Present?**	**Notes**
P1	Y	N	
P2	Y	N	
P3	Y	N	
P4	N	N	
P5	N	N	
P6	N	N	
P7	DAMP	N	
P8	DAMP	N	
P9	DAMP	N	
P10	N	N	
P11	N	N	
P12	N	N	
P13	N	N	
P14	N	N	
P15	N	N	
P16	N	N	
P17	N	N	
P18	N	N	
P19	N	N	
P20	N	N	
P21	N	N	
P22	N	N	
P23	Y	N	
P24	Y	N	
P25	Y	N	
P26	DAMP	N	
P27	N	N	
P28	N	N	
P29	N	N	
P30	DAMP	N	
P31	Y	N	
P32	Y	N	
P33	Y	N	AREA BENEATH BACK PORCH OF BUILDING #60 (Long building by Stockton Lake)
P34	Y	N	
P35	N	N	
P36	N	N	
P37	N	N	
P38	N	N	
P39	N	N	
P40	N	N	
P41	N	N	
P42	Y	N	STORM BASIN
P43	Y	N	
P44	Y	N	
P45	Y	N	
P46	Y	N	
P47	Y	N	
P48	DAMP	N	
P49	N	N	

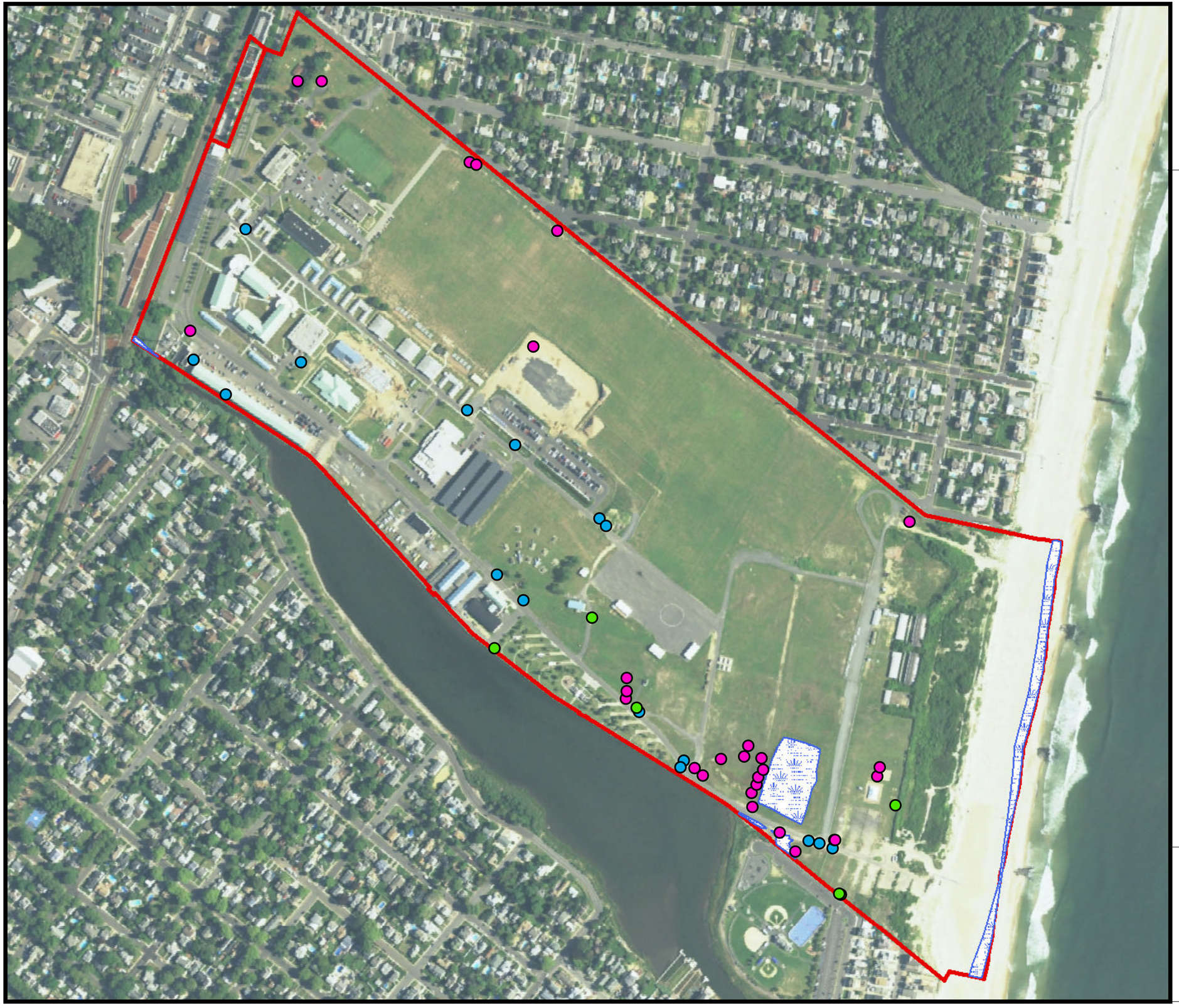


Figure SG1
Mosquito Breeding Habitat

Site: Sea Girt NGTC
August, 2019

Legend

- wetland_area
- Installation_Area
- Standing Water
- Damp
- Dry

0 250 500 1,000 Feet

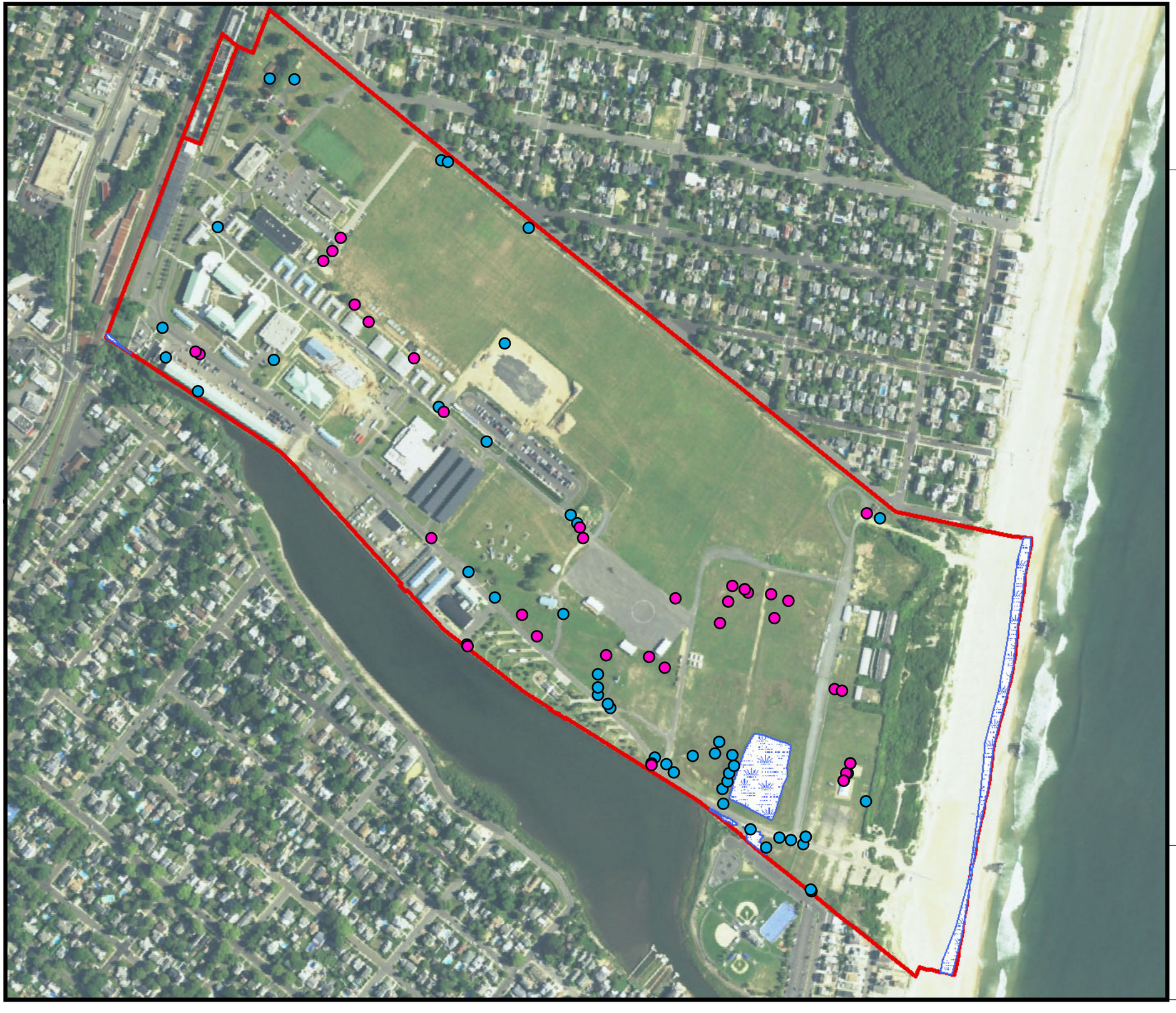
1 inch = 425 feet

N

Scale:	1 inch = 425 feet
File:	Mosq_Habitat_Aug2019
Date:	9/6/2019
Created By:	John Hallagan

Figure SG2
Mosquito Breeding Habitat

Site: Sea Girt NGTC
2018 & 2019



Legend

- 2018 MosqSurvey
- 2019 MosqSurvey
- wetland_area
- Installation_Area

0 250 500 1,000 Feet

1 inch = 425 feet

N

Scale:	1 inch = 425 feet
File:	Mosq_Habitat_2018,2019
Date:	9/6/2019
Created By:	John Hallagan