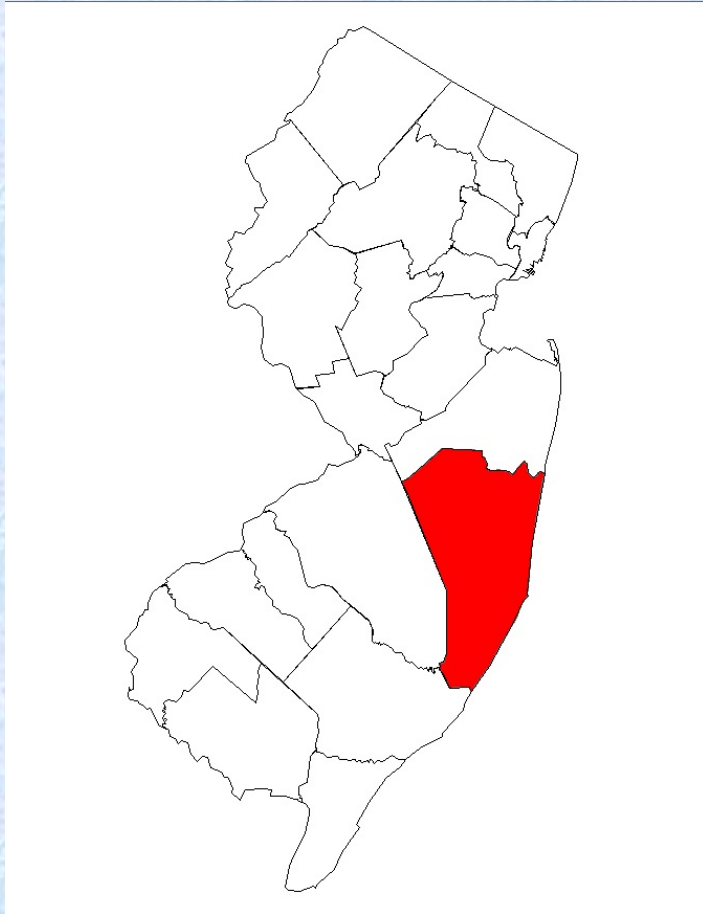


Aerial Larviciding for Floodwater Mosquitoes of the Salt Marshes of Ocean County, NJ

Presented by Mike Senyk



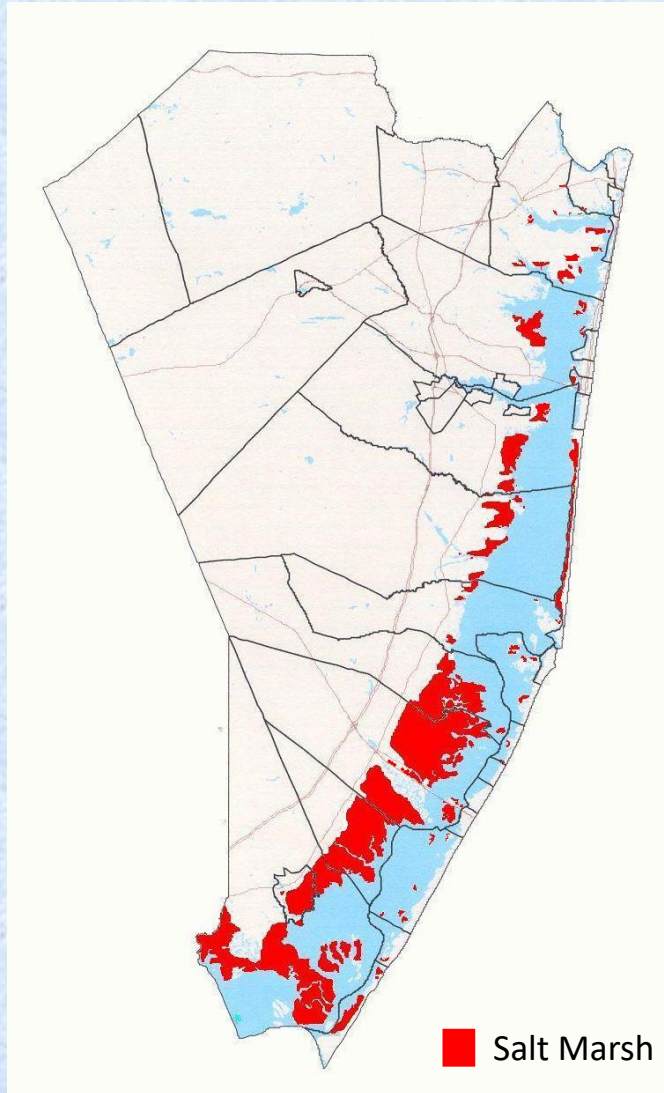
Ocean County, NJ



- Located in the southern half of New Jersey
- 638 square miles of land
- 45 miles of coastline along the Atlantic Ocean



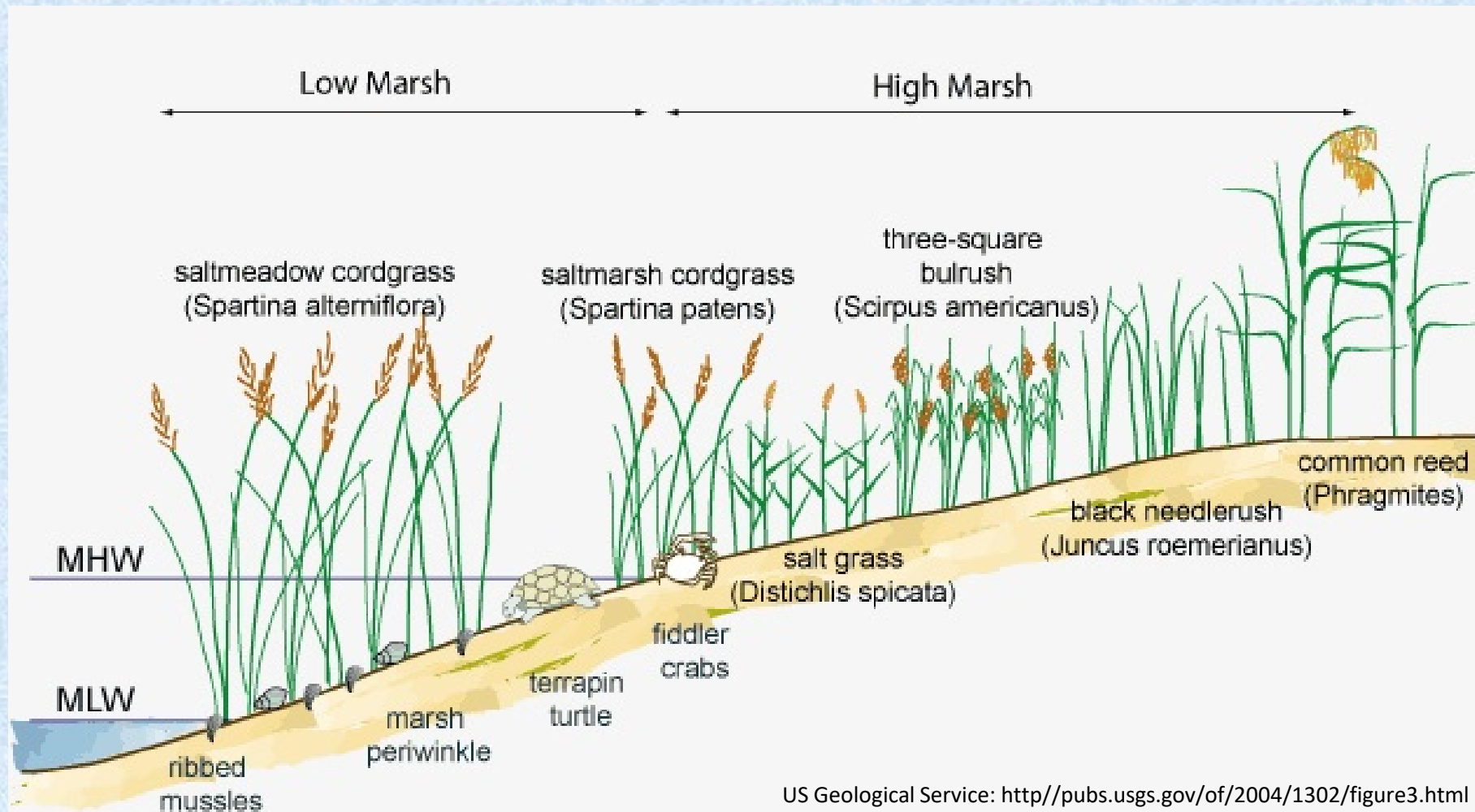
Ocean County Salt Marsh



Approximately 28,000 acres of salt marsh in Ocean County



Salt Marsh Zones



The low marsh is separated by the high marsh at the Mean High Water Line

Spartina patens (Saltmeadow Cordgrass, Salt Hay)



Patches of *Spartina patens* are highlighted as light green from the air.

Salt Marsh Flooding Factors: Tide, Rain, and Wind



Salt Marsh Flooding Factors: Tides



Full Moon



New Moon

You can expect the marsh to flood about twice a month, around the peaks of the full and new moon phases.

“Spring Tides” refer to the extreme rise and fall of water level during a full or new moon.

Salt Marsh Flooding Factors: Rainfall



19 rain gauges are checked daily throughout Ocean County to monitor rainfall

An inch or more of rain over a dry marsh can trigger a brood of salt marsh mosquitoes.

Summer thunderstorms, which unleash heavy amounts of rain in a short period of time, are a true mosquito maker.

Rainfall broods can be problematic because the actual amounts of rain can vary over a large area.

Salt Marsh Flooding Factors: Winds



Flooding caused by high, easterly winds

High winds blowing over the ocean/open bay for an extended period of time can push enough water to flood the marsh.

These winds are generally out of the east.

Floodwater Mosquitoes of the Salt Marsh

Our “Big Three” Species:

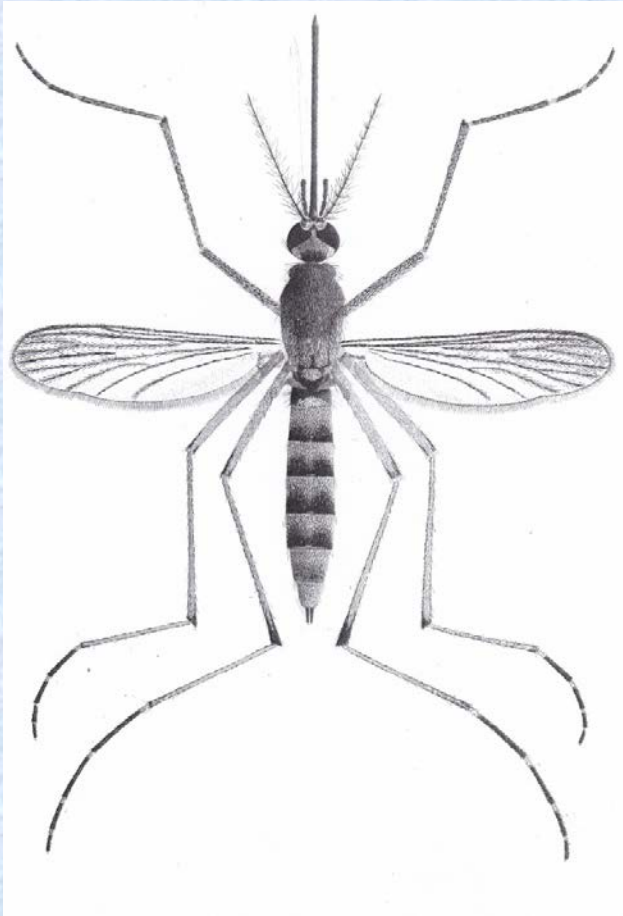
Ae. cantator

Ae. sollicitans

Ae. taeniorhynchus

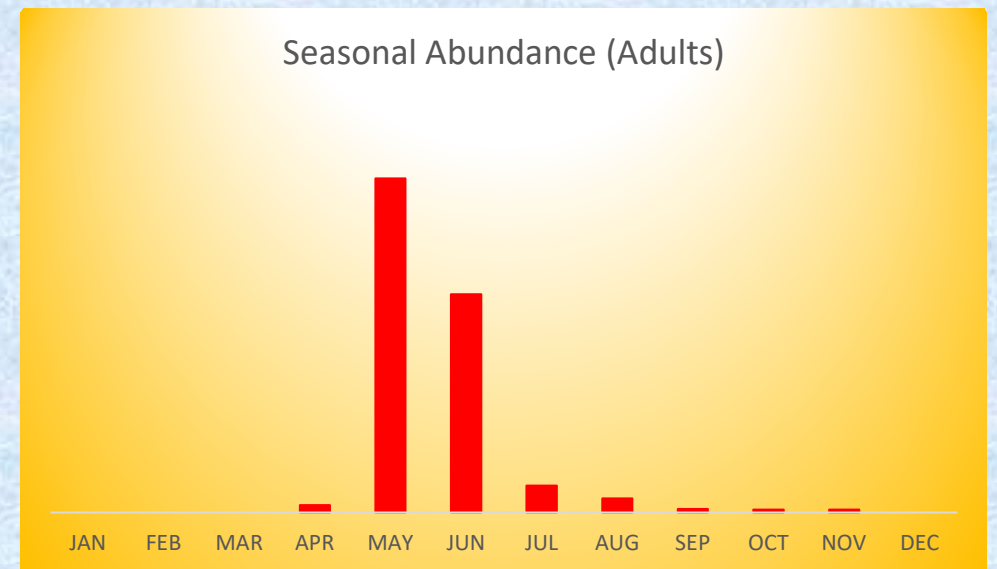


Aedes cantator

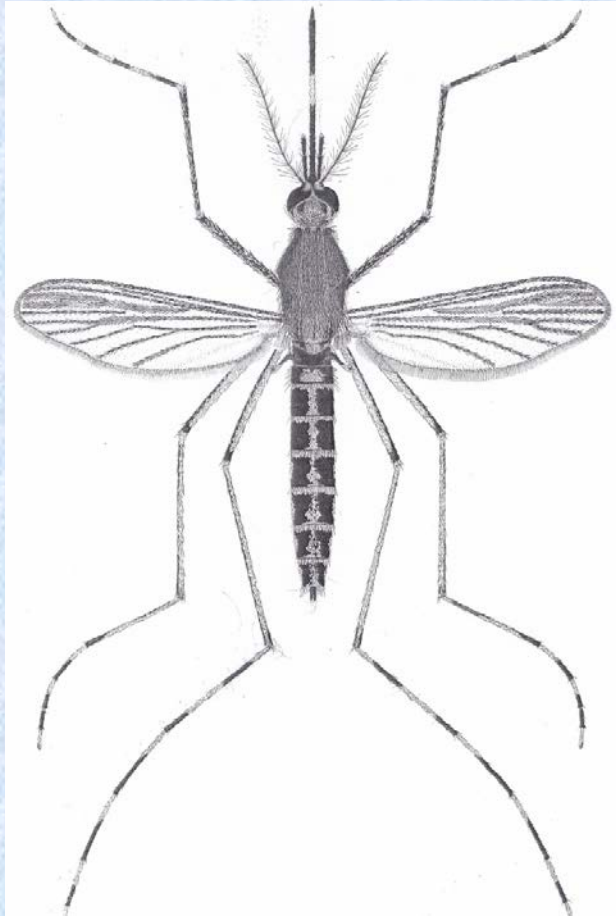


Larvae are found on high marsh, particularly at the tree line.

This mosquito can be an aggressive biter but is often overshadowed by other species.



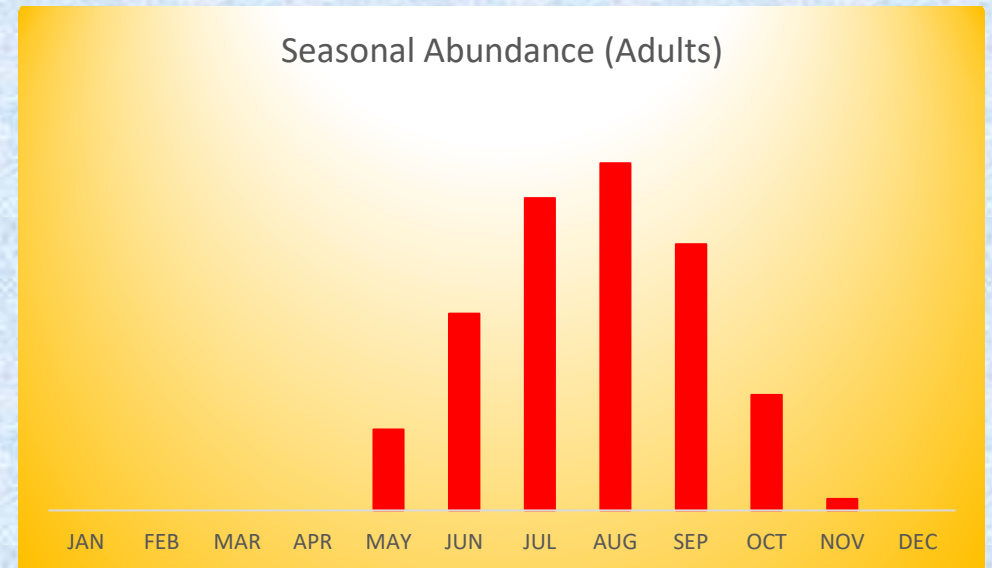
Aedes sollicitans



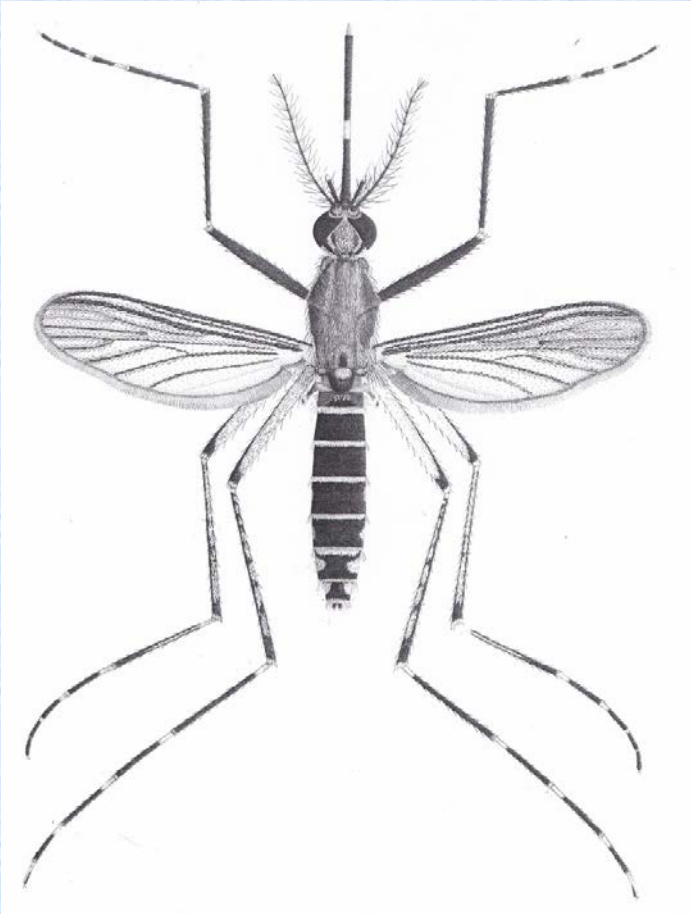
Larvae are found on the open high marsh to the tree line.

Major nuisance species in summer.

Tied to Eastern Equine Encephalitis transmissions in humans and horses.



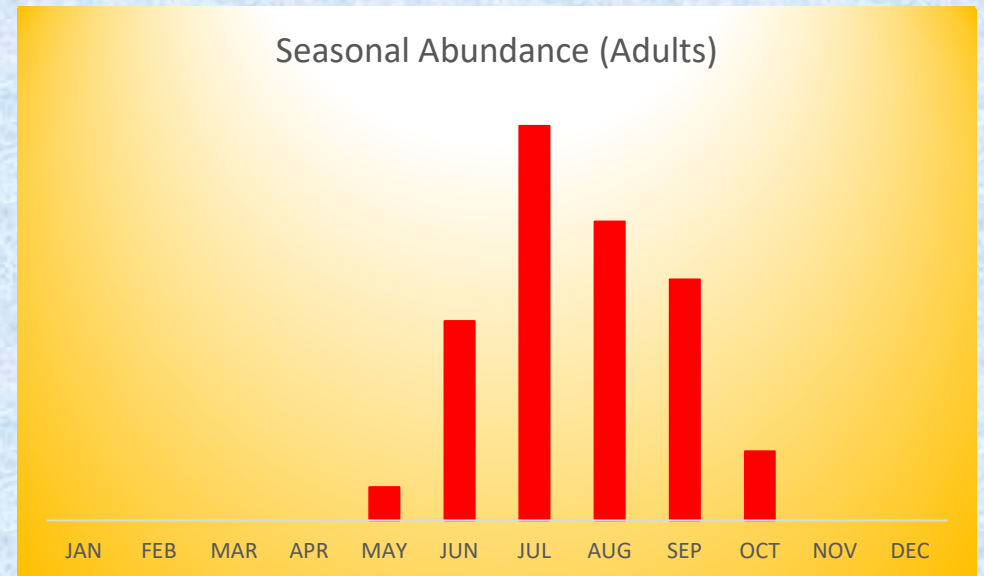
Aedes taeniorhynchus



Larvae are found on the open high marsh to the tree line.

Often found with *Ae. sollicitans* but in smaller numbers.

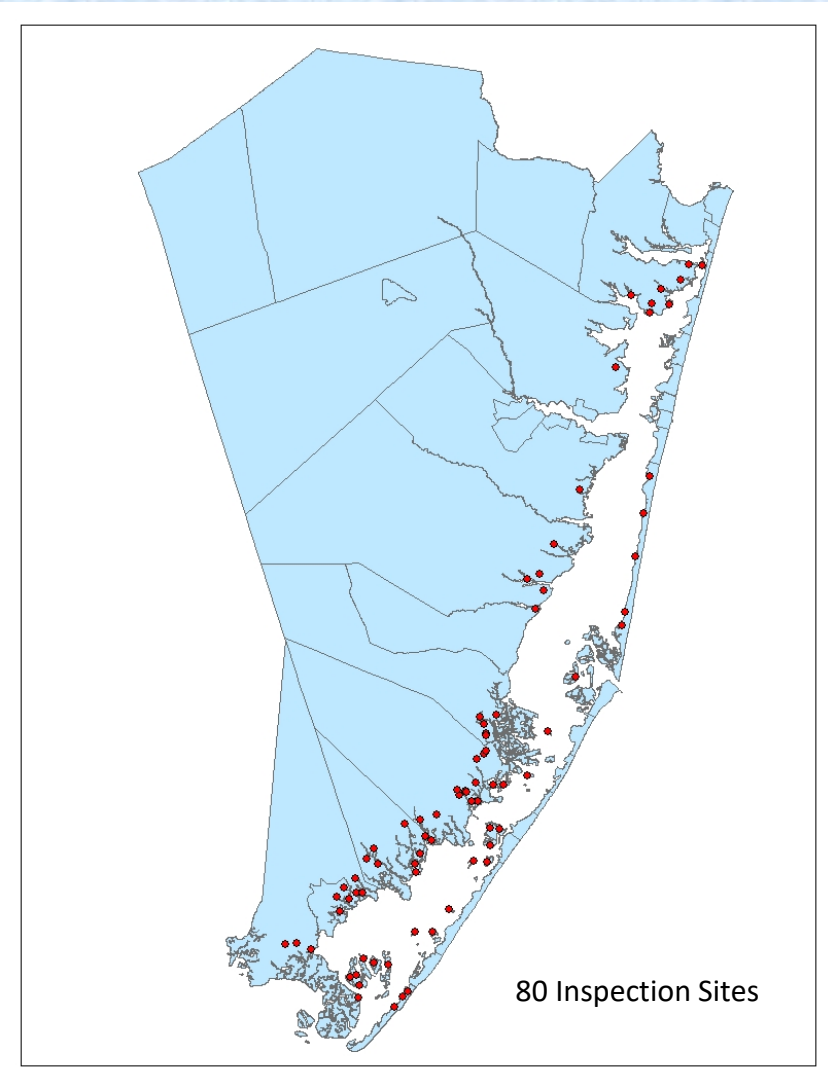
Once only found in the extreme southern end of Ocean County, *Ae. taeniorhynchus* is becoming more established each year.



Salt Marsh Mosquito Control



Larval Mosquito Inspection



Bell Jet Ranger used for inspections



Inspections are made at least twice a week, mid-April to early October.

Controlling Salt Marsh Mosquitoes

Liquid Larvicide (Single Brood)

- Used on the open salt marsh where low-growing vegetation is present



Granular Larvicide (Single Brood)

- Used at the marsh edge or tree line where tall growing vegetation is present



Extended-Release Larvicide

- Used in special situations that are unsuitable for a single brood application



Liquid Larvicide Application



Larvicide:	VectoBac 12AS
AI:	Bti
Rate:	32 oz./acre
Swath:	90 ft.
App. Height:	10 ft.
Target:	<i>Ae. sollicitans</i> and <i>Ae. taeniorhynchus</i> larvae at 1 st and 2 nd instar

Liquid Spray System



Bell 206B III Jet Ranger with Simplex Liquid Spray System



Spray Boom with Nozzles



RA-4 Raindrop Drift Reduction Nozzle

Liquid Larviciding: Open Salt Marsh Application



Small depressions or "potholes"
within salt marsh grasses

Granular Larvicide Application



Larvicide:	VectoPrime FG
AI:	Bti, Methoprene
Rate:	4 lbs./acre
Swath:	75 ft.
App. Height:	45 ft. (treetop)
Target:	<i>Ae. cantator</i> , <i>Ae. sollicitans</i> and <i>Ae. taeniorhynchus</i>

Granular Spray System



We use an FAA approved self-fabricated system which consists of a “hopper” and a short pair of booms.



Granular Larviciding: Tall, Vegetated Marsh Application



Low areas within the salt marsh tree line

Extended-Release Larviciding:



- Areas that are known to produce mosquitoes
- Areas that are hard to inspect by foot or by helicopter
- Areas where entry or application period is restricted

Extended-Release Application (Granular)



Larvicide:	MetaLarv S-PT
AI:	Methoprene
Rate:	4 lbs./acre
Swath:	75 ft.
App. Height:	45 ft. (treetop)
Target:	<i>Ae. sollicitans</i> and <i>Ae. taeniorhynchus</i>

Monitoring Treatments: Single Brood

VectoBac 12AS: Can be backchecked 24 hours after treatment to determine larval mortality

VectoPrime FG: Can be backchecked 24 hours after treatment BUT any living larvae should be observed into the pupal stage.



Monitoring Treatments: Extended Release

MetaLarv SP-T: If possible, collect pupae and monitor in an emergence jar.

Area can also be monitored by using landing rates or mosquito traps set during the 42-day period in the surrounding area.



Emergence Jar



CDC Trap
(Bait: Light/CO₂)

Controlling Mosquitoes in a Dynamic Environment

The salt marsh is always subject to changes brought on by extreme weather events and sea-level rise, effecting flooding patterns and the areas where mosquitoes can breed.



Massive tree die-off from saltwater intrusion



Phragmites mortality from continuous flooding

THANKS FOR LISTENING!

OCEAN COUNTY MOSQUITO EXTERMINATION COMMISSION
AERIAL LARVICIDING STAFF:

Barry Glenn – Pilot

Robert Reichert – Pilot

Matthew Herflicker – Inspector/Loader

Michael Villanova – Inspector/Loader