SOUTHAMPTON TOWN TRUSTEES THREATENED AND ENDANGERED SPECIES MANAGEMENT AND PROTECTION PROGRAM

Figure 1. Piping plover brood monitored during the 2023 threatened and endangered species program at Westhampton Beach. One chick reached fledge hood.

Scientific Report 2023

Threatened and Endangered Species Program Staff
Staff Program Coordinator/Editor: James Duryea
Crew Leader/Author: Laura V. Castrillón Hoyos
Stewards: Joann Smith, Matthew Mazzella, Polina Gurba, Willow Mercer and Grace Blaustein

TABLE OF CONTENTS:

I. EXECUTIVE SUMMARY

Every year from March until September, the Town of Southampton Trustees execute the Threatened and Endangered Species Management Program (T&E program) that consists of monitoring 26 miles of coastline, which includes 8 ocean sites and 15 bays sites.

The program aims for conservation efforts that contribute to the recovery and protection of 2 migratory shorebirds species: piping plovers (*Charadrius melodus*) and least terns (*Sternula antillarum)*. Also, these efforts focus its attention on preserving and protecting two species of annual ocean plants: seabeach Amaranth (*Amaranthus pumilus)* and seabeach knotweed (*Polygonum glaucum*).

In 2023, T&E program monitored a total of 58 piping plover pairs that nested in Southampton township jurisdiction and 83 chicks that successfully fledged giving a productivity of 1.43 for the species.

In addition, a total of 219 least terns nesting pairs visited the areas during the breeding season with 234 chicks that successfully fledged, giving a productivity of 1.07 per pair.

Overall, 45 seabeach amaranth plants were found along 8 ocean sites, 8 seabeach knotweed plants found at 4 ocean sites and around 1794 seabeach knotweed plants found at 7 bay areas.

Over the season, these species face multiple disturbances that were considered threats to their survival and breeding success. The main challenges identified include natural predators, rough weather conditions, human disturbances such as unattended dogs, trespassing into protected areas, inadequate garbage disposal, paragliding, the use of drones, kites, and ORV's.

II. CURRENT SPECIES STATUS

Piping plovers (*Charadrius melodus*) are listed as federally threatened, and New York State (NYS) endangered species. Additionally, least terns (*Sternula antillarum*) are considered as a NYS threatened species. On the other hand, the annual coastal plants seabeach amaranth *(Amaranthus pumilus)* is listed as federally and NYS threatened, and the seabeach knotweed (*Polygonum glaucum*) is a NYS rare species of special concern (NYNHP, 2016).

III. PROGRAM OBJECTIVE

The T&E Program provides protection to the populations of threatened and endangered flora and fauna that are found on coastal beaches and rely on these zones for breeding and for the continuation of their species longevity. Conservation efforts for these flora and fauna are focused on increasing the annual productivity rate of these species which consequently aims for the recovery of their population.

To achieve these efforts, the program assesses the current threats that affect each species' population and applies their conclusions to form protective actions that can effectively minimize and negate the consequences of these threats for the species. The objective of this program is to protect the endangered species that rely on Southampton's shoreline habitat while working closely with the public as well as educating the visitors that frequently use these areas.

IV. HISTORY OF THE PROGRAM

Prior to 1998, the U.S. Fish and Wildlife Service (USFWS), the Nature Conservancy (TNC), and the New York State Department of Environmental Conservation (NYSDEC) jointly managed threatened and endangered species recovery in the Southampton area. However, due to a decrease in staffing and resources provided by the NYSDEC and TNC, the Southampton Trustees initiated their own threatened and endangered species program. Preceding 2011, the Town of Southampton Trustees were responsible for 13 miles of ocean beaches as well as 16 bay sites. During the 2011 season, the Trustees worked with TNC to become familiarized with the Westhampton Island sites. In 2012, the Trustees began to manage the 5.5 miles of ocean beach from Roger's Beach Pavilion in Westhampton to Tiana Pavilion in Hampton Bays. Currently, the Trustees manage a total of 18.5 miles of ocean beach sites and 15 bay sites. The remaining sites in the Town of Southampton are managed by TNC, NYSDEC, USFWS, Suffolk County Department of Parks Recreation and Conservation (SCDPRC) and a private consulting firm. Over the course of 20 years, sites have been both added and removed, altering the distance that is monitored during the breeding season. Historically, the total distance monitored has varied between 18.9 all the way up to 25.8 miles.

V. Life History, Conservation, and Recovery Efforts

The piping Plover is a small migratory shorebird with a grey sand upper body color and white underparts. They have orange legs, a single black or brown neck band which is often incomplete, and some of them can hold a black band across the forehead (USFWS). Its colorations work as a method of camouflage on the sandy and rocky beaches where they annually spend their breeding season. These coloration characteristics are also known as breeding plumage (USFWS) (Fig 2).

Fig 2. Piping plover adult in Westhampton Beach. Piping plover adult and its brood was monitored through 2023 T&E program.

Piping plovers travel from different countries including Texas, North Carolina, the Bahamas, and the Greater Antilles to the New York coastline (New York State Department of Environmental Conservation). Every year starting Mid-March, piping Plover males arrive at Long Island's breeding grounds to establish their nesting and territory boundaries following the arrival of the females.

These birds usually nest on the coastline and prefer locations with open grounds or sparse vegetation, with absence of erosion in the dunes. They have a high nesting preference for uniform sandy shorelines with no vegetation or depleted foredunes, and moderate rocky locations away from water. Therefore, their site preferences make this shorebird a species indicator that reflects the good conditions and health of the coastal habitats where they nest (USGS 2017). In fact, piping plover's exhibit nesting site fidelity, meaning that they will return year after year to the same breeding locations. The high site fidelity of coastal piping Plovers suggests that patches of coastal breeding habitats have remained suitable for long periods to return, and those habitats where site fidelity starts decreasing, could indicate that habitat quality is poor or declining (Cohen, J. *et al.* 2006).

Based on previous T&E programs and the data collected in the last years, "symbolic fences" are installed in those suitable or historic locations where piping plovers have shown nesting site fidelity. However, shorebird protection can be rearranged to provide optimal buffer protection from disturbances within the season based on piping plovers' pairs behaviors which is also conditioned by the unforeseen situations that can occur in every location.

Symbolic fences are made up of wooden and metal posts linked by flagged string and informative signs attached to every corner post (fig. 3). The main purpose of the protective symbolic fence is to isolate breeding grounds to avoid any disturbances that cause nest abandonment or destruction and represents a buffer protection for shorebird chicks when they hatch. (Fig 3)

Figure 3. Symbolic fence made up of wooden post and flagged string. Symbolic fence in Tiana with triple string to avoid dogs and human disturbances inside protected areas.

From Mid-March through May, males will display courtship behaviors while establishing their territory boundaries. In some cases, two males will be displaying threatening behaviors for territory disputes while showing off to the female; on the ground, male approaches female, stands upright with neck stretched, and rapidly stamps feet with odd high-stepping gait (National Audubon Society). When the pair bond is formed, males will create multiple “scrapes” which are shallow depressions that the female will choose as a potential nest site. Scrapes are often decorated with seashell fragments that the female will add before laying eggs and well camouflaged along the wrack line, near rocks or in the shadow of gentle dunes/vegetation (Fig. 4)

Figure 4. Nest decorated with seashells and eggs well camouflaged within rocks.

Figure 4. Nest hidden behind dune vegetation.

After copulation, the female will lay one egg every other day until a full clutch is formed, which is usually three to four eggs. When the female starts laying the first egg, behaviors can vary, but the pair often can be found foraging and far from the nest until a third egg is laid or full clutch is completed. Once the clutch is complete, the incubation process starts which is shared by both sexes and lasts for approximately 25-28 days before the chicks begin to hatch (USFWS) (Fig. 5).

Figure 5 *Figure 9. Recently hatched piping plover chicks loafing inside the nest in Old Town Beach.*

If a nest failure occurs, the pair will attempt to re-nest up to four times within a breeding season. Nest failure can be caused by many factors, including disturbance while incubating, exposure, predation, abandonment, infertility, vandalism, and nest washout caused by wave or tidal. In areas with a high predatory presence, a predator enclosure will be installed around the nest for protection (Fig. 6).

Figure 6. A predator enclosure made up of 10 ft. of wire mesh and a mesh top installed around a piping plover nest that is at risk for predation.

Piping plovers have different ways of defending their nest or chicks: Broken wing display is one of the most common forms of defensive behavior, as the name implies, the bird will act injured, flailing around on the ground to distract the perceived predator. According to the Great Lakes Piping Plovers website,

when chicks hatch, piping plovers give calls to warn the chicks to hide if danger is nearby, the chicks respond by flattening down and the sand color of their backs makes them nearly invisible.

After estimating the hatch date of a nest, snow fencing will be placed perpendicular to the dunes at a distance of 1,000 meters in either direction from the nest location, restricting vehicle access in the area (Fig 7). This is done 3-5 days in advance of the estimated hatch date. Piping plover chicks are precocial, meaning that they will begin foraging within 24 hours of hatching, scurrying between the foredune and intertidal zones. Without the ability to fly, the chicks are at risk from predation, as well as human disturbance, especially from ORVs.

Figure 7. Snow Fence installed to protect chicks in Southampton Beach by closing access to ORV

After hatching, the chicks take approximately 25-35 days to fledge, during which the brood will remain within close distance of each other for protection from the elements and predators. Once a chick's ability to fly for a minimum distance of 15 meters is observed, they will be considered fledged and record it into the species productivity. At last, the snow fence will be removed, and ORV access will be open.

Finally, after fledging, piping plovers start congregating in small groups to prepare for their long migration departure to the South where they will winter, which starts as early as July, and as late as October (Fig 8).

Figure 8. Group of Piping plovers congregating in Westhampton Beach before migration departure.

Least Tern (*Sternula antillarum*)

The least tern is a small migratory coastal bird that utilizes Long Island's shoreline for breeding and reproduction. These colonial nesters can be found in groups ranging from 5 to upwards of 100 pairs or even just a pair nesting alone if they are late breeders. They are identifiable by a grey back, white underside and a black capped head with a white browband. Adult terns arrive at breeding grounds between late April and mid-May. Like piping plovers, least terns create scrapes, although they tend to be shallower. They select similar habitats to the piping plover for nesting such as; sand flats, gently sloped foredunes, and flat expanses of beach above the high tide line. Both species can be seen sharing nesting habitats, as they do not compete for food. Pairs will lay a full clutch of one to three eggs per nest from late May through June. During the incubation process, both least terns' parents will share the incubatory responsibilities, which lasts approximately 20-23 days, at which point the chicks will begin to hatch (Fig 9). Within a few days of hatching, chicks will begin to move outside of the nest. They are semi-precocial and depend on their parents for feeding and protection (National Audubon Society). Terns are loud and extremely protective of their young and nesting territories; they are known for swooping at intruders when they feel threatened. During the summer, chicks can be seen sheltering in the shade of beach debris and foliage. Least tern nesting colonies are protected with symbolic fences, same as piping plovers. Symbolic fencing is arranged around the colony and rearranged based on their breeding behaviors, followed by snow fencing a few days prior to the hatching of nests. At approximately 20 days old, the chicks will fledge, and shortly thereafter, depart for their wintering grounds, which can happen as early as August and typically no later than the end of September. (NYNHP, 2016)

Figure 9. Recently hatched least tern chicks loafing inside the nest.

Seabeach Amaranth (*Amaranthus pumilus*)

For many years, it was assumed that this annual beach grown plant had been eradicated from the coastal ecosystems of Long Island, however, it was found again in 1990. Unfortunately, this plant has lost approximately two-thirds of its historic range. Natural population of seabeach amaranth currently occur on long island grounds growing in dynamic areas of the beach profile on accreting shorelines between the dunes edge and the high tide line, often in the same areas as nesting shorebirds. Germination of seabeach amaranth occurs between June and July on Long Island, coming to maturation between August and September. During the maturation period, plants will continue to grow, bloom, and disperse seeds by wind. At the same time, this plant is a species indicator of a healthy ecosystem and contributes to coastal resiliency by helping to bind the sand fortifying the beach profile. Several important threats remain, including beach stabilizing structures such as sand fencing; mechanical beach raking; vehicle use; intensive recreation; and rapid sea level rise (USFWS). Plants can range in size from a few inches to a few feet in diameter (Fig. 10)

Figure 10. Seabeach Amaranth (Amaranthus pumilus) in Southampton Beach

Seabeach amaranth plants are protected by a small flagged and signed symbolic fence to prevent ORV and pedestrians' traffic from damaging them (Fig. 11). It's imperative for the plant to survive until it's mature enough to disperse its seeds. To be considered for delisting, seabeach amaranth must be found within a minimum of six states that fall within its historic range with plants occupying a minimum of 75% of this suitable habitat. These requirements must be met for each site for a minimum of 10 years. According to the most recent 5-year review of seabeach amaranth, it was suggested that no changes be made to the plants listing even though the plant is found within six of the states within its historical range, given that the data does not encompass the 10-year requirement (USFWS 2007).

Figure 11. Symbolic fence to protect seabeach Amaranth plants and seabeach Knotweed plants.

Seabeach Knotweed (Polygonum glaucum)

Seabeach knotweed is considered a rare plant in NYS, annually found mostly in bay areas of the Town of Southampton between the foredune, shoreline, and bordering salt marshes. It is typically located in areas that are sparsely vegetated and have a relatively flat topography, often within shorebird protection (Fig. 11). Knotweed typically flowers from May to October and fruits from June to November. They disperse their seeds through wind, wave action and birds. In New York State, 43 existing populations are currently recognized, which are relatively stable although due to the dynamic environment these plants grow in, there are fluctuations in population numbers from year to year. Seabeach Knotweed faces similar threats as seabeach amaranth. Seabeach knotweed is protected in the same way as amaranth, signed symbolic fences are installed or usually shorebird fencing is used for its protection. To determine the quantity and quality, the populations are derived from 5-year averages for species evaluation (NYNHP 2016)

VI. MONITORING METHODS

Symbolic protective fences are put up at the end of March before piping plovers arrive at breeding grounds. Usually, after April 1st courtship season begins, and the official day to monitor the piping plovers starts on the same date. The Least terns arrive later in the season, and seabeach Knotweed and seabeach Amaranth begin growing in late July.

Each site is visited at least once a week by coastal stewards, however, monitoring every location more than once a week is recommended. During the beginning of the season, pair bonds are identified while closely watching their behavior and possible nest sites (scrapes). This information would help on the next visits when looking for nests if none have been laid yet.

Coastal stewards record all the details found during the visit using a notebook log. The main data collected includes detailed location of the nest, human disturbances, potential predators, other threats, and all threatened and endangered species activity. Stewards constantly monitor any activity outside of the protected area. If birds begin nesting outside of symbolic fencing, it's imperative to catch it quickly to construct fencing around the new nesting area. Furthermore, if a nest failed, Coastal stewards would assess the loss event to determine the reasons and use the guidelines exposed in the document "Categories of Piping Plover Nest & Egg Loss" from the DEC and the division of fisheries and Wildlife.

Additionally, T&E program aims for public engagement. Therefore, coastal stewards constantly educate the community about the importance of threatened and endangered species protection and the scope of T&E program.

VII. RESULTS

Over the course of 2023 breeding season, 58 piping Plovers pairs returned to Long Island breeding grounds with 83 chicks that made it to fledged hood. Piping plovers reached a productivity of 1.43 this year, which refers to the number of fledges produced by the breeding pairs. As mentioned before, T&E monitoring program aims for conservation efforts that enable the piping plovers to be taken off from the endangered species list in New York. To achieve that, a productivity of 1.5 fledges per pair for 5 years consecutively must be maintained for the entire region. Even though productivity was higher in 2023 season compared to 2022, the goal was not met (Fig. 12).

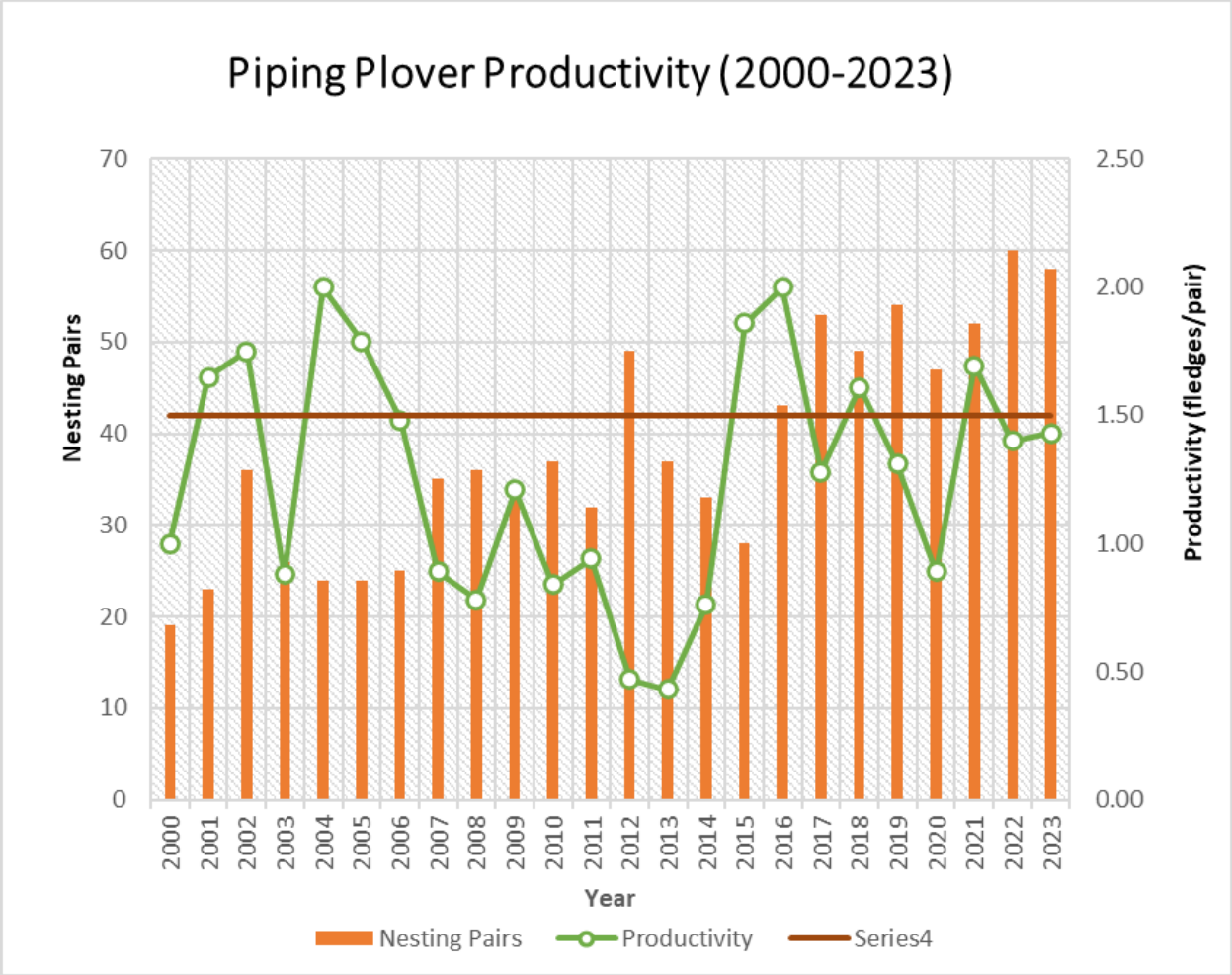


Figure 12. The graph above depicts the productivity levels for piping plovers in Southampton Township from 2000-2023. The productivity level for this season was 1.43, which is below the goal of 1.5. The seasons that met this goal were 2001, 2002, 2004, 2005, 2015, 2016, 2018 and 2021.

For the season, 73 piping plover nests were laid, and 25 of them failed; during 2023 program, the number of nest failures were significantly low compared to 2022 season. Overall, 275 eggs were laid, but just 160 eggs successfully hatched; 28% of these eggs that hatched did not make it to fledge, and around 30.18% of the chicks reached fledge hood.

As seen in figure 13, the percentage of loss categories that took place this season for piping plovers eggs failure include: 13.1% of the eggs predated by wildlife, dogs, or feral cats. 5.5% of the eggs were lost during storms that cause the eggs to be wind swept or sanded over resulting in nest abandonment. 2.9% of the eggs were washed out by high tides or flooding during storms or strong winds. Furthermore, 9.1% of the eggs never hatched due to infertility, and 4.7% of the eggs were lost for unknown circumstances which refers to the situation where coastal stewards did not find predator tracks or enough evidence to determine a possible reason for the loss.

One of the categories that was included apart from general predation, was presumed ghost crabs predation in areas where its presence was reported. According to our data, ghost crabs were responsible for 5.1% of the egg's loss. Although it could be higher, the lack of evidence could limit the results. In many cases, ghost crabs would predate with no trace left behind. In fact, a ghost crab was photographed preying on a piping plover egg from one of the nests that was being monitored at Westhampton beach by the 2023 crew (Fig 14).

Figure 14. Ghost Grab (Ocypode quadrata) preying on a piping plover egg. Ghost Crab photograph was captured at Westhampton Beach site.

Moreover, 1.5% of the eggs were abandoned which corresponds to one nest with 4 eggs. The pair never returned to their nest and dogs were speculated to be the cause of its abandonment as multiple dog footprints were near it.

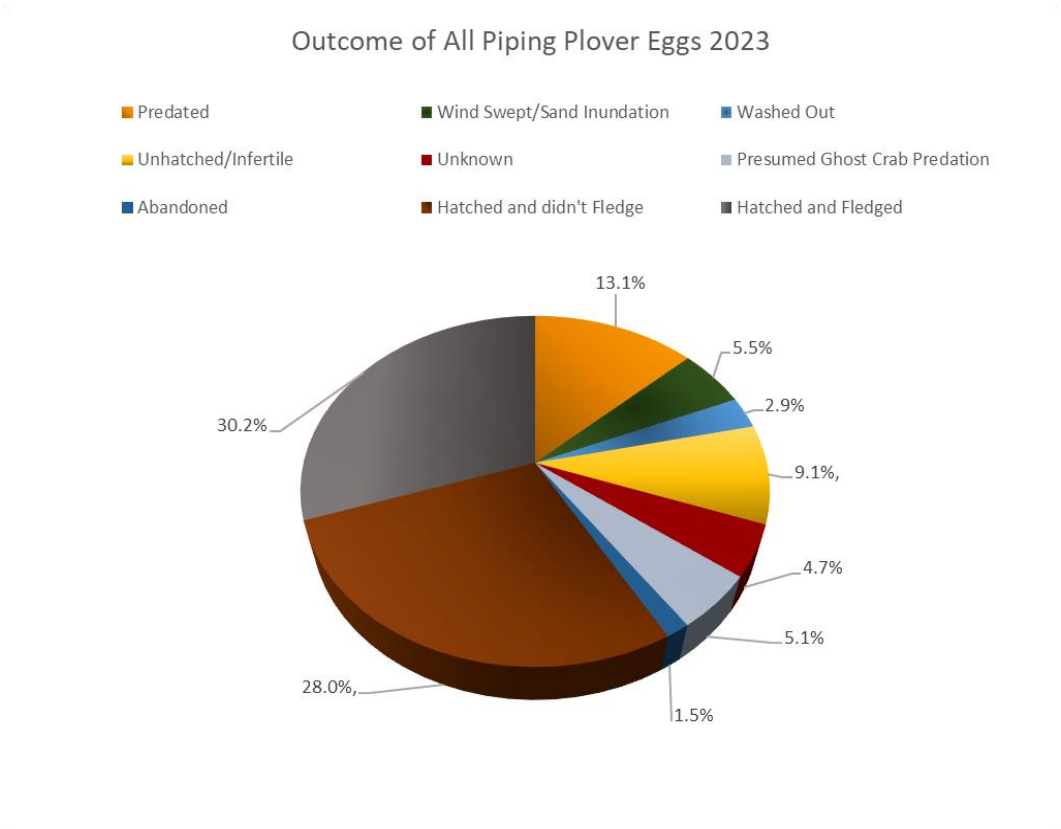


Figure 13. The above pie chart shows the outcome of all 275 piping plover eggs laid this season. Only 30.2% of all eggs laid this season fledged and presumably made it to adulthood. All other eggs were lost to the circumstances listed above.

Finally, 160 piping plovers' chicks hatched in total, but just 30.18% made it to fledge that corresponds to 83 fledglings. The causes of chick's failure events were determined by carefully assessing the area for tracks or evidence to build a high confidence in the details of the loss. One of the threats found in the areas was predators like foxes, raccoons, ghost crabs, seagulls, bald eagles, ospreys, and feral cats that inhabit these locations and occupy the same space as these birds. The second reason that was assumed to be one of the major reasons for chicks' failure events was off leash dogs that ran up inside protected areas. Very often, dogs' owners and dog walking companies' owners left domestic animals unattended and ignored symbolic fences.

ORV drivers were also a concern. Drivers would drive near symbolic fences, around snow fences or remove 4x4 barricades that protected shorebird chicks during the hatching season. Coastal stewards would find tire tracks close to symbolic fences where piping plovers and least terns nested and close the area that shorebird chicks were using to forage and grow.

Throughout the monitoring season, Coastal stewards found human footprints inside protected areas which was an important threat for eggs during the incubation process. Even though, destruction of eggs by humans' steps were not reported this season, the trespassing of symbolic fences by the public was reported to be a major threat for shorebird chicks.

Finally, litter such as balloons, fishing lines, human clothes, food leftovers, and garbage from social gatherings or parties were reported for both beaches and bay locations; it represented a huge threat for the shorebirds. Other human disturbances reported were drones, kites, and paragliding activities.

In general, 219 nesting pairs of least terns used Southampton breeding grounds with 234 chicks that fledged giving a productivity of 1.07 fledges per pair. These shorebirds faced the same threats mentioned in previous paragraphs for the Piping Plovers. Additionally, storms and strong winds were one of the main reasons that caused nest and territory abandonment in least terns. During the season, three major weather events reached these areas, but just two of them brought a significant disturbance to the colonies in some areas after June 24th and July 16th.

At last, a total of 45 seabeach amaranths were found across 8 ocean sites and approximately 1802 seabeach knotweeds in 4 ocean sites and 7 bay areas. Seabeach plants experienced the following threats during the season: ORV drivers that drove down the symbolic fences and near the plants; ORV driver drove over 24 seabeach knotweed plants at Towd Point site (Fig 15). Furthermore, amaranth plants were vandalized and ripped up from the ground at Southampton Beach (Fig 16).

Figure 15. Shorebird Symbolic fence at Towd Point site down. ORV drivers drove through the protected area and destroyed 24 seabeach knotweed plants. Tire tracks found inside symbolic fence.

Fig 16. Seabeach Amaranth plant removed from the ground in Southampton Beach. Human footprints were found inside the Symbolic fence and the plant was destroyed.

SITE AND SUB-SITES SUMMARY

Westhampton Island

Westhampton Island consists of approximately 5.5 miles of beach extending from Roger's Beach pavilion to just east of the Round Dune housing complex. This site is broken down into two sub-sites: Hampton beach and Tiana beach. Nineteen piping plovers nested at these locations that made twenty-three nest attempts. A total of 33 chicks that fledged for a productivity of 1.74 per pair. On the other hand, thirty least terns' pairs were found nesting in the site with 50 fledglings giving a productivity of 1.6 per pair. Finally, five seabeach amaranth and three seabeach knotweed were found within the location.

The disturbances and challenges that these species constantly faced across the area include off leash dogs, people walking inside protected areas and ignoring the restrictive signs, ORV drivers that often removed snow fence during hatching season, and social gatherings near symbolic fences. The predators identified across the locations were dogs, seagulls, crows, bald eagles, and ghost crabs. Ghost crabs exhibit a heavy presence in the area, establishing their burrows around the nests and broods (Fig 17).

Plover Activity: 18 pairs, 33 fledglings, 1.73 productivity
Terns Activity: 30 pairs, 50 fledgling, 1.66 productivity
Seabeach Amaranth: 5
Seabeach Knotweed: 3

Figure 17. Ghost Crabs Burrows in Tiana Beach. These burrows were present around shorebird chicks and around Endangered and threatened shorebird nests.

Hampton Beach

The most western site of Westhampton Island extends from Roger's Beach pavilion to just east of the Round Dune housing complex. Eleven breeding pairs of piping plovers nested in Hampton Beach with fourteen nest attempts. A total of 22 chicks fledged, giving a productivity of 2.00 fledges per pair. During the season, eleven nests successfully hatched, with three piping plover pairs that succeeded in their second nest attempt. The causes for nest failure were identified as assumed predation and eggs that were sanded over causing nest abandonment.

Nineteen breeding least terns' pairs attempted to nest in the location with 33 chicks that fledged; giving a productivity of 1.73 fledges per pair.

Three seabeach amaranth and three seabeach knotweeds were found in the area. Some of these plants were outside of the shorebird protected area, but coastal stewards installed a small symbolic fence for protection.

Multiple concerns were identified in the area; throughout the season, the heavy presence of Ghost crabs was considered a big challenge for the success of the nest and the survival of the chicks. Least tern adults were photographed having disputes with ghost crabs (Fig. 18). Furthermore, a ghost crab was photographed preying on a piping plover egg from a nest that was being monitored during the 2023 program (Fig 14). Fortunately, three eggs remained safe until the hatching date, and one of the chicks made it to fledge.

Additionally, off-leash dogs constantly ran up inside protected areas. Even though Coastal Stewards would approach the situations, in most cases dog owners would refuse to leash their dogs and let them freely run near shorebird chicks or shorebird nests. Very often, this event would happen repeatedly with the same dog owners. Incidents were reported, but the situation remained the same throughout the season.

Other predators identified were: Bald eagles, and seagulls in short proximity to nesting grounds. Also, Coastal stewards witnessed the presence of kites in front of the broods or nesting pairs.

During the program, coastal stewards had to rearrange symbolic fences, and some residents tried to refuse the installation of shorebird fencing in front of their property, wildlife officers' assistance was required in those cases.

Finally, there are alarming gaps in education among residents and the rest of the public that visit the beach, not only about the threatened and endangered species program, but also about the regulations that protect these species.

Three seabeach knotweeds and three seabeach amaranths were found in the area.

Plover Activity: 11 pairs, 22 fledglings, 2.00 productivity
Tern Activity: 19 pairs, 33 fledglings, 1.73 productivity
Seabeach Knotweed: 3 plants
Seabeach Amaranth: 3 plants

Figure 18. Least Terns adults exhibiting threatening behavior towards a ghost crab in Westhampton beach.

Tiana Beach

This site starts east of the Round Dune housing complex and ends at the Tiana Beach pavilion. Eight piping plover nesting pairs returned to Tiana Beach breeding grounds. Seven of these pairs were successful on the first nest attempt.
The sub-site had just one nest failure event, ghost crab predation was assumed to be the reason of the loss, but the pair was successful in the second nest attempt.
In summary, a total of 11 piping plover chicks fledged giving a productivity of 1.38 fledges per pair.

Eleven Least terns' pairs nested in the sub-site with 17 chicks that successfully fledged, giving a productivity of 1.54 fledges per pair.

Throughout the season, piping plover chick's failure was higher than expected compared with the hatching rate obtained for the sub-site; seagulls and ghost crab predation was suspected to be one of the main reasons. During the monitoring of shorebird chicks, coastal stewards observed heavy traffic of ghost crabs and ghost crab burrows around shorebird broods which had a greater size than the chicks. Additionally, coastal stewards witnessed seagulls that constantly flew near the broods while the shorebird chick's parents defended their young, leading seagulls away from them.

Tiana Beach can be extensive, as residential buildings are in a great distance from it. Additionally, the dunes and the beach area are large and healthy, offering extra buffer protection to the shorebird pairs while nesting and for the young broods when they hatched..

Additional concerns includes, residents walking inside protected areas, ignoring symbolic fences and walkways made for their use, social gatherings near symbolic fences and ORV drivers who drove around the snow fence and passed over restricted signs.

Finally, two seabeach amaranth were found at this site.

Plover Activity: 8 pairs, 11 fledglings, 1.38 productivity
Tern activity: 11 pairs, 17 fledglings, 1.54 productivity
Seabeach Amaranth: 2 plants

Southampton Beach (Village)

Located within the village of Southampton, this site extends from the east boundary of the Shinnecock County Park to S. Main Street. Fifteen Plover pairs returned to the area with twenty nest attempts. A total of 18 chicks fledged giving a productivity of 1.2 fledges per pair.

Thirty nesting least tern pairs were observed in the site with 11 fledglings giving a productivity of 0.36 fledges per pair.

Thirty-seven seabeach Amaranth were found and three seabeach knotweed plants.

Southampton Beach Village has three sub-sites: Shinnecock County Park to Rd D, Rd D to Halsey Neck Lane, and Halsey Neck Lane to S. Main Street. The main threats identified for the site include dogs walkers with numerous off-leash dogs, crows, seagulls, foxes, residents walking through the protected area, beach visitors playing inside and out of symbolic fences, ORV drivers driving around snow fences and tractor raking the beach ignoring restricted signs and 4x4 barricades used to protect the chicks.

Additionally, storms and strong winds highly affected some of the sub-sites during nesting season.

Plover Activity: 15 pairs, 18 fledges, 1.2 productivity
Tern Activity: 30 pairs, 11 fledges, 0.36 productivity
Seabeach Amaranth: 37 plants
Seabeach Knotweed: 3 plants

Shinnecock County Park to Road D

There were eleven piping plover breeding pairs and twelve nest attempts, with a total of 15 chicks that fledged giving a productivity of 1.36 fledges per pair. The sub-site had just one nest failure event, predation was assumed to be the reason of the loss, but the pair was successful in the second attempt. Additionally, a piping plover brood with one chick completely failed two days prior to its fledging date; the reason was unknown.

Sixteen Least terns breeding pairs were found in the sub-site with 6 chicks that fledged giving a productivity of 0.38 fledges per pair. After July 16th, some least terns abandoned the area due to a strong storm that reached the island and sanded over most of the nests. A few nesting pairs from the colony remained in the location until the end of July. However, the productivity for the area was low, it was assumed that the high sensibility these birds exhibited to any disturbance could have affected their incubation and nesting process. Furthermore, coastal stewards found least tern nests near walkways, which highly disturbed the pairs when pedestrians walked by and ultimately caused nest abandonment.

Across the sub-site, multiple concerns represented threats and challenges for these species of shorebirds. First, natural predators such as seagulls and foxes; foxes were often observed walking through the dunes and usually near some of the piping plover broods. Second, at the beginning of the breeding season, off-leash dogs ran up inside protected areas, and during the entire season, pedestrians walked inside the fencing. Furthermore, drones flying in the area were a big concern; coastal stewards witnessed a drone flying around the area causing a huge disturbance to the shorebirds as shorebirds adults were trying to lead the drone away from their young ones; the case was reported.

Finally, while flightless chicks were present, it appeared ORV drivers drove around the protective snow fence, and a tractor passed over the 4x4 barricade installed to protect the young broods, thankfully no harm came to the chicks.

Thirty-two seabeach amaranth and two seabeach knotweed were found and protected with symbolic fences. On multiple occasions, seabeach Amaranth fencing were removed by the public, leaving plants unprotected. Also, two seabeach amaranth plants were removed from the ground and destroyed by human intervention.

Plover Activity: 11 pairs, 15 fledges, 1.36 productivity
Tern Activity: 16 pairs, 6 fledges, 0.38 productivity
Seabeach Amaranth: 32 plants
Seabeach Knotweed: 2 plants

Road D to Halsey Neck Lane

One piping plover nesting pair visited the sub-site with 3 chicks that fledged, giving a productivity of 3.00 fledges per pair. During the season, the pair was successful in their first nest attempt. Being the only brood in the area, the chicks had a large portion of ground to move, hide, and forage.

Three nesting least terns' pairs were found in the area with 0 fledglings giving a productivity of 0.00 fledges per pair.

Additionally, four seabeach amaranth and one seabeach knotweed were found in the sub-site.

Throughout the site, concerns about dog walking companies with numerous off-leash dogs running near protected areas; even though coastal stewards spoke multiple times with the people involved, the situation kept happening. In addition, protected areas with symbolic fences where the piping plover pair initially established their territory were highly disturbed and partially removed. It is assumed that given the disturbance caused in this portion of the protected area, the piping plover pair moved to a second location where they successfully nested.

Additionally, there was litter inside symbolic fences from social gatherings and bonfires.

Finally, ORV drivers drove around snow fence protection which had to be extended multiple times.
The predators identified around the area include seagulls, crows, and dogs.

Plover Activity: 1 pairs, 3 fledges, 3.00 productivity
Tern Activity: 3 pairs, 0 fledges, 0.00 productivity
Seabeach Amaranth: 4 plants
Seabeach Knotweed: 1 plant

Halsey Neck Ln to Gin Ln

Three piping plover pairs established their territory in the sub-site with seven nest attempts and 0 chicks that fledged giving a productivity of 0.00 fledges per pair.

Eleven least terns' pairs attempted to nest with 0 chicks that fledged, giving a productivity of 0.00 fledges per pair.

This site saw different concerns, but the most relevant was the storms and strong winds that reached the area throughout the season which made four piping plover nests fail; three of the nest attempts belonged to the same pair.
In the same way, least terns nesting pairs abandoned the area after strong winds reached the location between June 21st and June 24th. Even though least terns and piping plovers stayed protecting their nests during the rough winds, most of the least tern colony was gone after June 25th since all their nests were washed out or sanded over. These piping plovers and least terns' attempts were laid at the east side of Coopers Beach where the erosion and wrack line in this portion of the sub-site would reach and pass dune vegetation by at least 5 feet during storms (Fig. 19).

The second concern in this area was off-leash dogs running near and inside protected areas which was believed to be one of the reasons that caused nest abandonment for one of the piping plover pairs. Four eggs remained in the bowl, but the pair never returned to continue with the incubation process. Coastal stewards found a high presence of dog's footprints around and near the nest.

The sub-site is very popular among visitors, being a busy location during summertime.

At last, predators such as seagulls and raccoons were identified during the season.

Finally, one seabeach Amaranth was found in the area.

Plover Activity: 3 pairs, 0 fledges, 0 productivity Tern Activity: 11 pairs, 0 fledges, 0 productivity Seabeach Amaranth: 1 plant

Figure 19. High tide reached the wrack line where the Piping plover and Least Terns nesting pairs were incubating their eggs on June 24 of 2023. Sub-site showed constant shoreline erosion throughout the season.

Gin Lane

The site was inactive for shorebirds activity, but one seabeach amaranth plant was found.

Seabeach amaranth: 1 plant

Old Town Beach

This site stretches from Old Town Road to Squabble Lane. Three piping plovers' pairs visited the area with three nest attempts and 2 chicks that fledged, giving a productivity of 0.67 fledges per pair. The area had two nests that successfully hatched, but the third nest was completely gone, predated by seagulls as their fresh tracks were present around the nest.

Five nesting least tern pairs used the area with 4 chicks that fledged giving a productivity of 0.8 fledge per pair.

One piping plover pair from Water Mill site (Fowlers Beach sub-site) laid their second attempt in this area, but it failed. Ghost crab's predation was speculated to be the reason for the loss. The amount of ghost crab tracks around the nest during incubation and after the nest failed was the evidence to assume the reason for the failure.

Another threat identified for the site was off-leash dogs, this area is among the areas that have the highest traffic of off-leash dogs. Coastal stewards witnessed unattended dogs that ran inside protected areas where the broods were located. Residents and Dog walking companies constantly disregarded symbolic fences, restricted signs, and coastal stewards call outs. These repeated events were reported, but the situation remained the same throughout the season.
Off leash dogs' events were considered to be one of the first causes for the low fledge rate in the location.

Finally, there are alarming gaps in education among residents and the rest of the public that visit the beach, not only about the threatened and endangered species program, but also about the regulations that protect these species.

Plover Activity: 3 pairs, 2 fledges, 0.67 productivity Tern Activity: 5 pairs, 4 fledges, 0.8 productivity

Water Mill

This site falls just to the West of Fowlers Street and extends out to Jobs Lane. Encompasses three sub-sites: Fowler's Street, Flying Point Pavilion and Scott Cameron Beach with approximately 2.38 miles. Water Mill is composed of three town beaches as well as two roads that provide public ORV access. This site also includes Mecox Bay, which is located between the Flying Point Road access and Scott Cameron Beach. When the water level in the bay is low, mudflats are exposed and become ideal foraging habitats for piping plovers and other migratory shorebirds. Most of the summer season, Mecox Bay was not open to the ocean, but dredging was able to proceed after piping plovers' chicks fledged. However, least tern's pairs were nesting in the area while it was done. Before Mecox bay was open, the distance between the closest least tern nest and the canal was determined to make sure that dredging was safe for all the least tern nesting pairs.

Seven piping plover pairs nested in the site with eight nests attempts and 8 fledglings, giving a productivity of 1.14 fledges per pair.

Throughout the season, thirteen-four least tern's pairs nested, with 55 chicks that fledged giving a productivity of 1.61 fledges per pair.

One seabeach amaranth was found for the whole site.

One of the main challenges these shorebirds faced during the breeding season were pedestrians walking inside protected areas, and residents ignoring walkways. Protected areas located at the east and west side of Mecox Bay were constantly a concern throughout the season; group of people of all ages would

trespass symbolic fences and step on breeding grounds while shorebirds were incubating their eggs usually to shell fishing, disregarding restricted and regulation signs. This event involved incidents where the public reaction was confrontational and inappropriate.

Additionally, off-leash dogs running inside protected areas located across the site was usually a concern. Other activities such as paragliding, drones, boats and kayaks landing at the bay were also considered threats for shorebirds nesting pairs and their chicks.

These repeated events were reported, but the situation remained the same throughout the season.

Other disturbances were ORV drivers that trespassed or removed 4x4 barricades to drive on the beach while flightless chick were present. Finally, predators identified in the area include birds of prey, crows, and foxes.

Plover Activity: 7 pairs, 8 fledges, 1.14 productivity Tern Activity: 34 pairs, 55 fledges, 1.61 productivity Seabeach Amaranth: 1 plant

Fowlers Beach

There was one piping plover nesting pair in the area with two nest attempts, but both attempts were unsuccessful. The reason for the first failure was unknown and for the second attempt, ghost crab predation was suspected to be the cause.

This site was inactive for least terns and seabeach plants.

Plover Activity: 1 pairs, 0 fledges, 0.00 productivity

Flying Point Pavilion

This site extends from the Flying Point Pavilion to the Cut Beach. Two pairs of piping plovers nested in the area with 4 chicks that fledged, giving a productivity of 2.00 fledges per pair.

Nine pairs of least terns nested in the area with 13 chicks that fledged, giving a productivity of 1.4 fledges per pair.

The majority of the breeding grounds were concentrated to the west side of Mecox Bay. Throughout the season, there were multiple human activities reported during the visits, including shellfishing, paragliding, and drones flying around the area. Human footprints next to the nests that contained eggs were very common. Moreover, people would land their kayaks in the protected area and drag their vessels through nesting grounds where threatened and endangered shorebirds were incubating their eggs.

ORV drivers would often drive around the snow fence that was used during chicks' season to protect the broods. Coastal Stewards kept extending the snow fence to avoid careless drivers near protected areas.

Also, off leash dogs were a daily threat for the nesting birds and their chicks as owners left dogs unattended running inside the protected areas. These repeated off leash dogs' events were reported, but the situation remained the same throughout the season.

Tracks of predators such as foxes and presence of seagulls were identified for the sub-site.

Plover Activity: 2 pairs, 4 fledges, 2.00 productivity
Tern Activity: 9 pairs, 13 fledges, 1.4 productivity

Scott Cameron

This site extends from the end of Dune Road to Jobs Lane. Four pairs of piping plovers nested in the areas with four nests attempts, and 4 chicks that fledged giving a productivity of 1.00 fledges per pair. One piping plover chick was found dead near the shoreline, but the cause of the death was unknown. The incident was reported.

Additionally, twenty-eight least terns nested in the area with 42 chicks that fledged giving a productivity of 1.5 fledges per pair.

Most of the breeding grounds located at the east side of Mecox Bay were occupied by least terns and young piping plovers that moved to this portion of the sub-site until they fledged. Shorebirds in this location faced the same threats that were mentioned above for Flying Point sub-site at the west side of Mecox Bay.

The potential predators identified in the area for shorebird eggs and shorebird chicks were crows, seagulls and feral cats. Piping plover and least terns were seen exhibiting threatening behavior against seagulls when they approached near their nesting grounds or close to their chicks.

Additionally, residents walking into the protected area and leaving their belongings inside of the symbolic fences was a repeated event.

Moreover, Off-leash dogs running inside protected areas was an important concern especially for shorebird chicks. Off leash dogs would even be present in the area after July 1st when no domestic animals were allowed to be on the beaches. Coastal stewards reported the repeated cases, but the situation remained the same throughout the season. Scott Cameron beach has a large portion of beach and dunes, offering extra buffer protection for shorebird nests and shorebird chicks, which was a positive characteristic that possibly increased their chances of remaining harmless from dogs.

The snow fence at Scott Cameron gate was removed multiple times to drive on the beach, ignoring the restricted signs.

Finally, beach parties close to protected areas and drones that flew off near to the symbolic fences represented a disturbance for the shorebirds and their young during the 2023 breeding season.

One seabeach amaranth was found for the sub-site.

Plover Activity: 4 pairs, 4 fledges, 1.00 productivity Tern Activity: 28 pairs, 42 fledges, 1.5 productivity Seabeach Amaranth: 1 Plant

Sagaponack Pond

This site stretches from Ocean Road to Gibson Lane. Sagaponack Pond lies in the middle of this site and provides a tremendous amount of foraging and nesting grounds for both the piping plovers and least terns. Four nesting pairs of piping plovers visited the area during breeding season, with five nests attempts and 2 chicks that fledged, giving a productivity of 0.50 fledges per pair.

Four least terns pairs nested in the area with 7 chicks that fledged, giving a productivity of 1.7 fledges per pair.

Throughout the season, this site had an alarming off-leash dog issue that was an important concern. Off leash dogs would even be present in the area after July 1st when no domestic animals were allowed to be on the beaches. In summary, dog footprints were found inside all the symbolic fences that were installed for the site. This disturbance was speculated to be the cause for a piping plover nest failure followed by territory abandonment; the piping plover pair in this location was not spotted in the area again after their first nest attempt failed.

Additionally, one piping plover brood with 3 chicks completely failed after five days of hatching. The reason was unknown, but high traffic of dog footprints was found in the location where the brood was present. After the chick's failure event, the piping plover pair continued to make scrapes for about 6 days more, but they did not achieve a successful re-nest attempt.

Moreover, a storm that reached the area from April 29 and April 30 washed out one of the nests. However, the pair succeeded in their second attempt.

Very often people would walk inside protected areas ignoring restricted signs, especially in the areas next to Sagaponack Pond. Furthermore, a 4x4 barricade to protect chicks was driven through on multiple occasions.

Predators such as foxes, crows and feral cats were identified in the area. Seagulls were reported in the area, but their presence was low during breeding and hatching season. The majority of these predator tracks were found in the portion of Sagaponack Pond.

Finally, Sagaponack Pond was dredged once at the end of shorebird breeding season, and after all the chicks fledged.

One seabeach amaranth was found for the whole area.

Plover Activity: 4 pairs, 2 fledges, 0.50 productivity Tern Activity: 4 pairs, 7 fledges, 1.7 productivity Seabeach Amaranth: 1 Plant

Fairfield Pond Lane Beach

This site is located between Gibson Lane and Townline Road. Two piping plover pairs nested in the area, three nests were laid and only one hatched. The other two nest attempts that failed belonged to the same piping plover pair; one of the causes was unknown and the second attempt was predated by raccoons. The piping plover pair tried to achieve a third nest attempt making multiple scrapes in the area, but the pair was not successful.
In summary, 4 piping plover's chicks made it to fledged giving a productivity of 2.00 fledges per pair.

Five least terns' pairs nested in the location with 1 fledgling giving a productivity of 0.2 fledges per pair.

During the 2023 season the area was not as popular as other beaches, but the location had concerns with off leash dogs, especially dog walking companies that left dogs unattended and ran freely in the area. Additionally, this area suffered erosion events which allowed high tides to reach the dunes area and wrack line.

Predators such as raccoons and dogs were identified for the area.

Plover Activity: 2 pairs, 4 fledges, 2.00 productivity Tern Activity: 5 pairs, 1 fledges, 0.2 productivity

BAY SITES

Red Cedar Point

Three pairs of piping plovers visited the area with four nests attempted and 8 chicks that fledged, giving a productivity of 2.67 fledges per pair. One piping plover nest failed and predation was suspected to be the cause of the loss as eggs disappeared from the bowl coupled with small mammal tracks near the area. The piping plover pair was successful in the second nest attempt.

Fifty-two nesting pairs of least terns were present in the area with 38 chicks that fledged, giving a productivity of 0.73 fledges per pair. On July 16, a storm reached the island and after this event, most of least tern nests were washed out due to flooding. As a result, the majority of the birds abandoned the bay. Therefore, this weather event is speculated to be the reason for low least tern productivity in 2023.

The presence of disturbances in this site includes predators like raccoons, and dogs. Additionally, boats and kayaks landed in the area, with a light presence of pedestrians walking in the location. However, the public that visited the area were mostly from the houses near the bay that seemed to keep out from symbolic fences.

Very often, coastal stewards would find food leftovers that could attract predators into the area.

This bay site is in a remote area located in a private community; this characteristic has brought benefits to migratory shorebirds during the breeding season as human activities are limited.

One hundred and thirty-eight seabeach knotweed were found. The plants were spread out mostly inside shorebird protection.

Plover Activity: 3 pairs, 8 fledges, 2.67 productivity
Tern Activity: 52 pairs, 38 fledges, 0.7 productivity
Seabeach Knotweed: 138 plants

Red Creek Pond

One piping plover pair returned to the area this season with two nests attempts. The first nest failed, and predation was suspected to be the reason. However, the pair was successful in their re-nest and three eggs hatched. Two chicks made it until day twelve, but unfortunately the chicks failed after that. Predation was speculated to be the cause as raccoons, foxes and ospreys inhabit the area, giving a productivity of 0.00 fledges per pair.

Seven pairs of least terns used the bay area for breeding purposes with 11 chicks that fledged, giving a productivity of 1.6 fledges per pair.

The main disturbances these species faced during the season include predators such as raccoons, foxes, dogs, and ospreys. There was a very light presence of pedestrians walking the area, including fishermen, and boats landing in the bay. Even though the area is not open for ORV drivers, ORV tire tracks were found throughout the season. Snow fence was installed to close the main entrance while chicks were present.

Twenty-two seabeach knotweed were found in the area.

Plover Activity: 1 pair, 0 fledges, 0.00 productivity
Tern Activity: 7 pairs, 11 fledges, 1.6 productivity

Seabeach Knotweed: 22 plants

Squires Pond
This site was inactive for both endangered birds and plants.

Meschutt Beach
This site was inactive for both endangered birds and plants.

Canoe Place Beach
This site was inactive for both endangered birds and plants.

Fish Cove/North Sea Harbor
The site was inactive for both endangered birds and plants.

Towd Neck

This site encompasses an area with an inlet that separates the location into western and eastern areas. The western area is generally desolate in terms of wildlife activity whereas the eastern area is a popular location for piping plover and least tern colonies to breed. The eastern and western portion of this site had a combined total of 1480 seabeach knotweed plants.

Seabeach Knotweed: 1480 plants

Towd Neck West

This sub-site is not a suitable habitat for the shorebirds and breeding purposes due to the lack of land extension. The area does not have the appropriate characteristics to offer safe nesting grounds for piping plovers or least terns. Additionally, this sub-site is highly disturbed by human activities such as ORVs, recreational activities, and social gatherings.

Ninety-eight seabeach knotweed were present in the area.

Seabeach Knotweed: 98 plants

Towd Neck East

Three Piping plovers' pairs nested in the area with four nests attempts and 6 chicks that fledged, giving a productivity of 2.00 fledges per pair. One piping plover nest failed due to infertility, but the pair was successful in their second nest attempt.

Thirty-five least tern pairs visited the area with 44 fledglings giving a productivity of 1.6 fledges per pair.

This sub-site had high traffic of pedestrians and off leash dogs that ran up on multiple occasions inside protected areas. Despite the off-leash dogs' concern, protected breeding grounds in this area are extensive which could have offered extra buffer protection to the shorebirds and shorebird chicks during this type of event.

During the season the snow fence installed to protect the shorebird chicks was removed, vandalized, and burnt (Fig 20).

Figure 20. The 4x4 Barricade that protected the chicks at Towd point site was vandalized and burnt leaving broods unprotected from ORV drivers.

Ospreys and dogs were identified as potential predators in the area.

In overall, 1382 seabeach knotweeds were found inside shorebird symbolic fences. However, ORV drivers drove through symbolic fences and destroyed 25 knotweed plants (Fig 15).

Plover Activity: 3 pairs, 6 fledges, 2.00 productivity
Tern Activity: 35 pairs, 44 fledges, 1.3 productivity
Seabeach Knotweed: 1382 plants

Wooley Pond

The site was inactive for both endangered birds and plants.

Roses Grove
The site was inactive for endangered birds. Seven seabeach knotweeds were found.

Seabeach Knotweed: 7 plants

Fresh Pond
The site was inactive for both endangered birds and plants.

Pine Neck
The site was inactive for endangered shorebirds. Two seabeach knotweed were found in the area.

Seabeach Knotweed: 2 plants

Long Beach

At the eastern end of Long Beach, one pair of piping plovers returned to breeding grounds with one successful attempt and 2 fledglings, giving a productivity of 2.00 fledges per pair.

Fourteen pairs of least terns nested in the area with 18 chicks that fledged giving a productivity of 1.3 fledges per pair.

Long Beach is a popular area during summer season, with a high traffic of pedestrians and off leash dogs that frequent the location. However, piping plovers and least terns overcame these threats and were able to raise their young.

Ninety-eight seabeach knotweed plants were found in the area.

Plover Activity: 1 pairs, 2 fledges, 2.00 productivity Tern Activity: 14 pairs, 18 fledges, 1.3 productivity Seabeach Knotweed: 98 plants

Short Beach
Forty-seven seabeach knotweed plants were observed at this site.

Seabeach knotweed: 47 plants

Genet Creek
The site was inactive for both endangered birds and plants.

Middle Pond
The site was inactive for both endangered birds and plants.

VIII. DISCUSSION

The term “Endangered” means a species is in danger of extinction throughout all or a significant portion of its range. On the other hand, “Threatened” means a species is likely to become endangered within the foreseeable future (ESA 1975). Endangered and threatened species of wildlife and plants are recognized to have an aesthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people (USFWS. 2015). Therefore, programs that aim conservation efforts to protect these species and their habits are crucial for the near future.

Human developments on the coastlines have caused a wide range of modifications to the ocean and coastal ecosystems. New York hosts one of the most densely populated and highly industrialized coastal areas in the world. This data includes the five boroughs of New York City, which also refers to Suffolk Counties located on Long Island. In order to provide protection to our coastal and ocean ecosystems that offer goods and services to the community, it is crucial to keep the ecological integrity and health of these areas that sustainably support the ecosystem services people want and need (NY Ocean Action Plan. 2016-2026). The ecological integrity and health of our coastal ecosystems is directly linked with the protection of its wildlife and their habitat.

The Town of Southampton coastal grounds are part of a large migratory path called Atlantic flyway which hosts a great diversity of migratory birds. Some species spend most of their time along coastal shorelines, while others live offshore, coming to land only to breed from May to September (NY Ocean Action Plan. 2016-2026).

T&E program monitors and protects piping plovers, considered a federally and NYS endangered species due to steady population decline that largely stems from poor reproductive success (Ivan, J & Murphy, R. 2005). Also, T&E program monitors and protects least terns, which is a NYS threatened species. As shown in our results, the threats that these migratory shorebirds constantly faced were numerous, not only natural threats which are part of the ecosystem, but anthropogenic activities that keep happening over the years. In fact, T&E reports from previous years mention numerous human activities that were present during the past seasons across the beaches and bay sites, and as of this year, the situation has remained current. Even though all the locations share the same threats along the coastline ecosystems, each site should be addressed individually.

Anthropogenic activities continue to increase along the coastal areas threatening wildlife, causing modifications to our ocean and coastal ecosystems, responsible for habitat and biodiversity loss (NY Ocean Action Plan. 2016-2026). The negative reach that these human activities had during the breeding season for the migratory shorebirds and their chicks were partially limited by the threatened and endangered species program (T&E). It supported piping plover and least terns during their courtship time, incubation process, and the ultimately goal to raise their young until fledge.

In 2023 season, predation was one of the reasons for piping plover nest failure events, occupying 13.1%. Natural predators found in all the areas were foxes, raccoons, seagulls, crows, ospreys, and bald eagles; feral cats and dogs were present in all the locations which were also considered predators; however, the presence of these animals in coastal ecosystems are the results of human intervention (Cortes, E *et al.* 2021).

According to Ivan, J & Murphy R. 2005, avian raptors, and especially mammals, are considered direct predators of eggs during the incubation stage of the breeding season. These predators represent a threat since the day these nesting shorebird pairs lay the first egg, until the day their shorebird chicks fledge. Avian species are a main threat for the survival of the chicks, especially gulls (Ivan, J & Murphy R. 2005). The last mentioned could be compared to our results related to piping plovers in some areas, where Fairfield Pond, Red Cedar, and Towd Point reported low presence of seagulls during our visits which could be one of the reasons associated with a high piping plover productivity compared to other sites. However, for Fairfield Pond, piping plover productivity could have been higher, but the presence of raccoons was a factor that affected piping plover hatching rate. It is important to mention that all the bay areas indicated above shared a common presence of avian predators, but with a lower number of individuals such as ospreys and bald eagles.

Additionally, our results show that locations such as Southampton beach reported the presence of both foxes and seagulls which was assumed to be one of the reasons for chick's failure events as they inhabit the same areas as the piping plover broods during the season. Similarly, piping plover fledge rate for Scott Cameron beach location was lower than expected compared to its hatching rate, but the presence of seagulls that disturbed piping plover broods and least tern nesting pairs was often reported during our visits.

According to our data, a high presence of unattended dogs and high traffic of dog's footprint inside protected areas were constantly reported for all the locations. Some locations with extensive and healthy dunes, coupled with a large beach area, provided extra buffer protection to the nesting shorebird pairs and the shorebird chicks during this type of events which possibly increased the chances of remaining harmless from off-leash dogs. As stated by Cortes, E. *et al.* 2021, domestic dogs become direct predators and a major source of disturbance for shorebirds and shorebird chicks. Disturbance involves situations where dogs harass or scare other animals without causing death but leading to behavioral changes and energetic or reproductive costs for the affected individuals.

Scott Cameron Beach, Westhampton Beach, Old Town Road, and Sagaponack Pond were areas with a special concern about off leash or unattended dogs. Coastal stewards would constantly witness numerous dogs running up inside symbolic fences where chicks were present, causing broods to change their location patterns. Unleashed dogs would unsolicited intrude into the coastal ecosystems during off dates when domestic animals were not allowed on the beaches, becoming very difficult for coastal stewards to interact with dog owners and keep these breeding grounds safe from dogs when no further legal actions were enforced against any non-compliant dog owners.

In accordance with the data gathered, it is speculated that off leash dogs' incidents are part of the reasons for low piping plover productivity in Sagaponack and Old Town. In Sagaponack Pond, one whole brood of

3 piping plover chicks failed after 5 days of hatching. Fresh and a considerably far distance of dog's footprints was found in the dunes area where the brood had established their territory while maturing.

Additionally, one piping plover pair lost their first nest attempt followed by territory abandonment. The presence of dog footprints around the nest was countless, as a result, all four eggs were gone and the pair never returned to the location. It is documented for other shorebirds that this type of dog's events could lead to lower nest attendance (Weston M.A *et al* 2007), behavioral changes (Weston M.A *et al* 2014), and in this case, territorial abandonment. The last was also confirmed with the least tern colonies at Sagaponack Pond; their nest attendance was negatively impacted by unattended dog events. In the same way, the above stated by Weston, M.A *et al.* 2007 & 2014 was confirmed at Southampton Beach site in the sub-site that encompasses Halsey Neck lane to Gin Ln, when a piping plover pair abandoned their nest with four eggs due to the presence of dogs near them.

Although unattended dogs were not directly related with nests or chicks' failure events in other sites other than the mentioned above due to lack of direct evidence, it is believed that the incidents where domestic pets were involved could have been higher than reported this season. Off leash dogs are a serious problem in all the locations and will always represent an important threat to the endangered shorebird species if it is not addressed promptly. A big number of residents and beach visitors in the Town of Southampton ignore pets' restrictions and environmental regulations that protect threatened and endangered wildlife from any harassment. Moreover, the majority of the beaches and bay locations do not have clear and visible dogs' signs restriction for dog owners when using the coastal ecosystems for this purpose.

Ghost Crabs (*Ocypode quadrata*) were identified as potential predators for least terns and piping plover eggs and chicks. As mentioned in our results, the major presence of these species occurred at Westhampton Beach, Tiana Beach, and a few in Old Town Road, being one of the speculated reasons for nest or chicks' failure events at the sites.

For instance, most of the piping plover nests hatched successfully at Tiana Beach, but the piping plover fledge rate was lower than expected. Ghost crabs were one of the assumed causes for chicks' failure events in the area as their burrows were countless, overcoming the size of piping plovers and least terns' chicks. Even though, the presence of ghost crabs around piping plover and least tern chicks was reported in every visit, least terns' adults in Tiana were observed more alert and defensive when ghost crabs approached near their chicks, speculating that their threating behavior was effective to decrease the chances of any harm for their young.

Ghost Crabs predation on shorebird chicks and eggs has been documented in different reports along the years: "Ghost Crabs preys on Piping plover eggs" by Watts, B. & Bradshaw, D. in 1995, "Presence of Ghost Crabs and Piping Plover Nesting Success" by Kwon, E. *Et al.* 2018. "Guidance and Best Practices for Coordinated Predation Management to Benefit Temperate Breeding Shorebirds in the Atlantic Flyway" in 2019, and the amount of literature available continues.

On the other hand, coastal erosion was observed in different sites, but according to our results, the most affected location by storms during this season was the sub-site that encompasses Halsey Neck Lane to Gin Ln, which is part of Southampton Beach site. The storms and the coastal erosion became the number one

reason for piping plover and least tern nests failure events, and a productivity of 0.00 for both species. In this sub-site, the majority of the least tern colonies' location was concentrated in the east side of Coopers Beach, which was equally affected by the same events. Least tern's colony in this sub-site exhibited a high tendency of behavioral changes after their nests were washed out by the storm, leading to territory abandonment. Similarly, this behavioral pattern was observed in other locations as indicated in our data. In fact, the beach at the sub-site became narrower, until no suitable area was available, leaving nests unprotected from weather events. As stated by New York Ocean Action Plan 2016-2026, the cumulative effects of climate change are often difficult to predict, but all coastal communities will be directly impacted by rise in sea level, coastal erosion, and storm surges from more frequent intense weather conditions. Besides the coastal erosion events, the high traffic of human activities at Coopers Beach increased in summer season and showed to be an important disturbance for shorebirds during their nesting period, lowering the rate of attempts and protection they could offered to their eggs.

In this portion of the sub-site, one piping plover lost their three nest attempts due to all the factors mentioned above, the areas chosen to lay their eggs were not suitable as nesting grounds options became limited. Climate change coupled with human interventions is a big concern for the reduction in quality of shorebirds nesting sites, forcing the birds to nest in less desirable areas, such as smaller, busier beaches with limited options for foraging (Department of Energy & Environmental Protection in Connecticut. 2021). Throughout the program, the need for constant environmental education that include the important role the communities play in conservation programs and mitigation plans, was seen as a necessity for these popular locations to support the integrity of the coastal structure.

Within the human activities reported in the 2023 T&E program, litter across the coastal ecosystems was immensely alarming. The presence of garbage would often be observed inside shorebird symbolic fences or very close to it. As mentioned in our results, food leftovers from social gatherings were very common, creating a primary predator attraction. Furthermore, numerous fish lines, plastic, and balloons litter our beaches, representing a threat for endangered shorebirds and their young as it was for other birds such as seagulls that were found injured by our crew due to these elements.

In the city of Chicago, the 2023 piping plover program reported one piping plover fledgling with a fishing line caught upon its left foot and leg bands. The efforts to capture the bird by the Chicago crew were unsuccessful and the fledgling has begun migration with the line tied around its foot. In order to protect our wildlife and beaches, a better litter management program is necessary for Southampton Town coastal ecosystems which must involve community education and law enforcement for careless people that do not practice correct garbage disposal.

Addressing other concerns that represented threats for the shorebirds and their chicks during this season is important. First, residents and visitors using protected areas and trespassing symbolic fences increased as the summer season was approaching its peak, which was considered a possible cause related with unsuccessful chicks. Heavy pedestrian traffic on beaches can cause chick mortality from people inadvertently disturbing flightless chicks or keeping the adult off from attending their young (Department of Energy & Environmental Protection in Connecticut. 2021). In fact, we observed changes in the behaviors and movements patterns of the shorebirds and their chicks when people invaded their territory in different ways; shorebirds parents would be highly disturbed losing their young from sight as chicks tried

to desperately hide, separating chicks from their parents, and being more susceptible to predation or complete failures. In this case, their territory would be protected by symbolic fences where no human activities were allowed, but very often the restrictions were disregarded.

During the 2023 season, it was observed how the program supported other species of shorebirds that benefited from the protected grounds. In the same way, numerous shorebirds that passed along our coastline during migration season were foraging undisturbed inside protected grounds supporting their journey to their final destinations.

All these anthropogenic activities that were present near and inside symbolic fences, not only caused disturbances to the shorebirds, but also to seabeach amaranth and knotweed plants. In our results, Towd Point, and Southampton Beach had events where members of the public trespassed protected areas and destroyed both seabeach amaranth and knotweed. These events are just part of the numerous incidents that take place during the summer season, and it continues to create pressure and negative impacts on the coastal ecosystem integrity.

At last, environmental education, public engagement, and the enforcement of regulations for recurrent unlawful events were identified as important strategies to decrease unfortunate events that negatively affect the ecosystems within the beaches and bay areas of Southampton Town.

IX. CONCLUSIONS

- In order to maintain the ocean and coastal ecosystem integrity and ensure the provision of goods and services it offers to the communities; it is crucial to support conservation efforts that pursue the protection of the threatened and endangered species of flora and fauna that inhabits these ecosystems.

- Threatened and endangered species are indicator species that reveal the health and condition of the ecosystems. The presence of these species suggests an area has remained suitable and quality has not declined throughout time.

- Beaches and Bay areas in Southampton town need the enforcement of off leash dog regulations during threatened and endangered shorebird breeding season to support and increase hatching and fledge rates.

- Beach visitors and homeowners are key factors during any conservation program. First, education about threatened and endangered species in schools is necessary to increase awareness and interest among young people. Additionally, education prior to and during the T&E program for homeowners is needed to increase the success of the program.

- Environmental education for the community is required to minimize unfortunate events that decrease the quality of the beaches and bay areas in Southampton town.

X. ACKNOWLEDGEMENT

The staff of the Southampton Town Trustees Threatened and Endangered Species program would like to give a huge thanks to everyone who supported our program during the 2023 season. Thank you, Board of Trustees; President Scott Horowitz, Secretary/Treasurer William Pell IV., Edward Warner Jr., Ann Welker, and William Parash for all of your continued support. Thank you Trustee Office Staff Jessica Feldman, James Duryea, Linnea Piazza, Stephanie Shea, Charlotte Van Houten, Lisa Koehne, and Nick Buscemi; the Southampton Town Bay Constables, Trustees Marine Maintenance division, Joe Jannsen of the Nature Conservancy, Steve Sinkevich of the USFWS, Michelle Gibbons, Fredrick "Chip" Hamilton, Casey Pendergast of the NYSDEC, the Southampton Town GIS Department, Southampton Village Trustees, Village Department of Public Works Superintendent and the public that had patience, understanding and respect towards the work that we perform. We also would like to thank the Suffolk County Threatened and Endangered Species program consisting of Diana Lynch and her endangered species staff, for collaborating and monitoring Southampton's Picnic Area. None of this work would have been possible without all of you, your hard work and dedication, Thank you.

XI. BIBLIOGRAPHY

Department of Energy & Environmental Protection in Connecticut. 2021. "Piping plovers" State threatened species. Piping Plover (ct.gov)

Cohen, J. B., Fraser, J. D., & Catlin, D. H. (2006). Survival and Site Fidelity of Piping Plovers on Long Island, New York. *Journal of Field Ornithology*, *77*(4), 409–417. http://www.jstor.org/stable/27639364

Cortés EI, Navedo JG, Silva-Rodríguez EA. Widespread Presence of Domestic Dogs on Sandy Beaches of Southern Chile. Animals (Basel). 2021 Jan 12;11(1):161. doi:10.3390/ani11010161. PMID: 33445632; PMCID: PMC7827244

Department of Environmental Conservation. "Piping Plover." Accessed August 13, 2023. https://www.dec.ny.gov/animals/7086.htm

Endangered Species act. 1973. Endangered Species Act | U.S. Fish & Wildlife Service (fws.gov)

Great Lake Piping plover. Life history. 2017. Life History of Great Lakes Piping Plovers

Ivan, J. S., & Murphy, R. K. (2005). What Preys on Piping Plover Eggs and Chicks? *Wildlife Society Bulletin (1973-2006)*, *33*(1), 113–119. http://www.jstor.org/stable/3784846

National Audubon Society. Guide to North American Birds. "Piping plover" (*Charadrius melodus).* Accessed August 13, 2023. Piping Plover | Audubon Field Guide.

National Audubon Society. Guide to North American Birds. "Least Tern" (*Sternula antillarum).* Accessed August 13, 2023. Least Tern | Audubon Field Guide.

New York State Department of Environmental Conservation. New York Ocean Action Plan. 2016-2026.

U.S Fish & Widlife Service. "Piping Plover" Accessed August 13, 2023. Piping Plover (Charadrius melodus) | U.S. Fish & Wildlife Service (fws.gov)

U.S Fish & Widlife Service. Seabeach Amaranth. Accessed August 13, 2023. Seabeach Amaranth (Amaranthus pumilus) | U.S. Fish & Wildlife Service (fws.gov)

U.S. Fish and Wildlife Service. "Seabeach amaranth" (Amaranthus pumilus) 5-Year Review: Summary and Evaluation." 2007. https://www.fws.gov/node/261020

U.S Fish & Widlife Service. 2015. Why save endangered species? Why Save Endangered Species? (fws.gov)

Wetland and Aquatic research center. (2017). United State Ecological Service. Managing and reporting annual Piping plover monitoring data. An Online Portal for Managing and Reporting Annual Piping Plover Monitoring Data | U.S. Geological Survey (usgs.gov)

Weston M.A., Stankowich T. Dogs as agents of disturbance. In: Gompper M.E., editor. *Free-Ranging Dogs and Wildlife Conservation.* Oxford University Press; Oxford, UK: 2014. pp. 94–116.

Weston M.A., Elgar M.A. Responses of Incubating Hooded Plovers (*Thinornis rubricollis*) to Disturbance. *J. Coast. Res.* 2007;233:569–576. doi: 10.2112/04-0151.1.

N

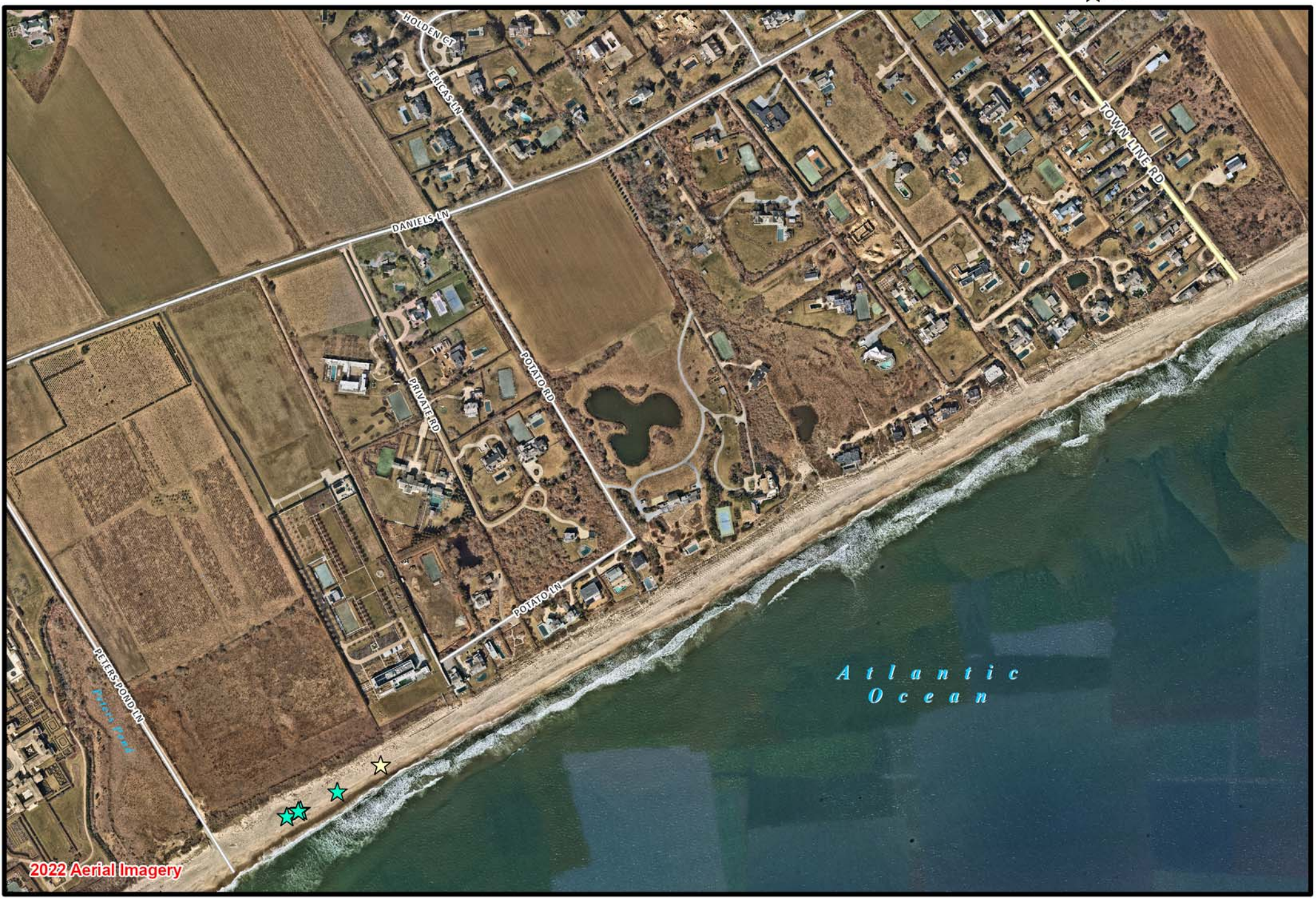
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023

0 25 50 100 150 200 Feet

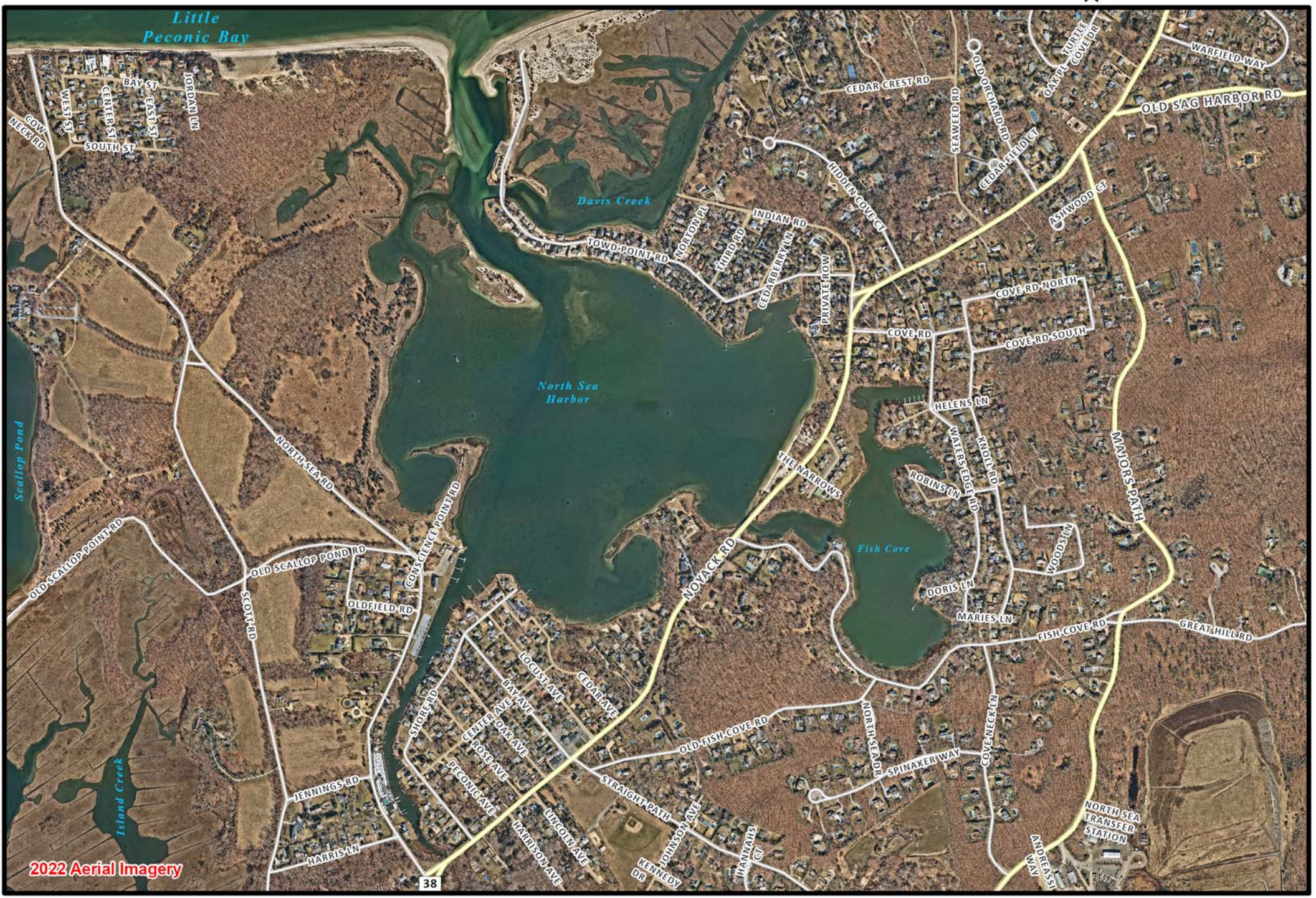
CANOE PLACE BEACH

Hampton Bays

2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 155 310 620 930 1,240 Feet
FAIRFIELD POND LANE BEACH (EAST)
Peter's Pond Ln to Town line Rd
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
HOLDEN CT
ERICAS LN
DANIELS LN
TOWN LINE RD
PRIVATE RD
POTATO RD
POTATO LN
PETERS POND LN
Peters Pond
Atlantic Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic
Information Systems October 2023
0 155 310 620 930 1,240
Feet
FAIRFIELD POND LANE BEACH (WEST)
Gibson Ln to Peter's Pond
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
DANIELS LN
FAIRFIELD POND LN
PETERS POND LN
Peters Pond
Fairfield Pond
GIBSON LN
CRESTVIEW LN
TREES LN
BOW OFF GIBSON LN
Atlantic Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 287.5 575 1,150 1,725 2,300 Feet
FISH COVE / NORTH SEA HABOR
North Sea
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Little Peconic Bay
Davis Creek
North Sea Harbor
Fish Cove
Scallop Pond
Island Creek
BAY ST
WEST ST
CENTER ST
EAST ST
SOUTH ST
JORDAN LN
COW NECK RD
CEDAR CREST RD
OLD ORCHARD RD
SEAWEED RD
CEDAR FIELD CT
OAK PL
TURTLE COVE DR
WARFIELD WAY
OLD SAG HARBOR RD
HIDDEN COVE CT
ASHWOOD CT
INDIAN RD
TOWD POINT RD
NORTON PL
THIRD RD
CEDARBERRY LN
PRIVATE ROW
COVE RD NORTH
COVE RD
COVE RD SOUTH
HELENS LN
WATERSEDGE RD
KNOLL RD
MAJORS PATH
THE NARROWS
ROBINS LN
WOODS LN
NOYACK RD
DORIS LN
MARIES LN
FISH COVE RD
GREAT HILL RD
NORTH SEA RD
CONSCIENCE POINT RD
OLD SCALLOP POINT RD
OLD SCALLOP POND RD
OLDFIELD RD
SCOTT RD
LOCUST AVE
CEDAR AVE
BAY AVE
CENTER AVE
OAK AVE
ROSE AVE
PECONIC AVE
SHORE RD
OLD FISH COVE RD
NORTH SEA DR
SPINAKER WAY
COVE NECK LN
STRAIGHT PATH
JENNINGS RD
HARRIS LN
HARRISON AVE
LINCOLN AVE
KENNEDY DR
JOHNSON AVE
HANNAHS CT
ANDREASSI WAY
NORTH SEA TRANSFER STATION
2022 Aerial Imagery
38

N

Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023

0 75 150 300 450 600 Feet

FRESH POND

Bulkhead to Lake Dr.

2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 105 210 420 630 840 Feet
GENET CREEK
North Haven
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Shelter Island Sound
Genets Creek
NORTH DR
WEST DR
SOUTH DR
EAST DR
STOCK FARM LN
EELKILLS HOLLOW
WIDOW COOPERS PATH
SEAPONACK DR
NORTH HAVEN WAY
2022 Aerial Imagery

N

Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023

0 210 420 840 1,260 1,680 Feet

GIN LANE BEACH (VILLAGE)

South Main St to Old Town Rd

2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony

N

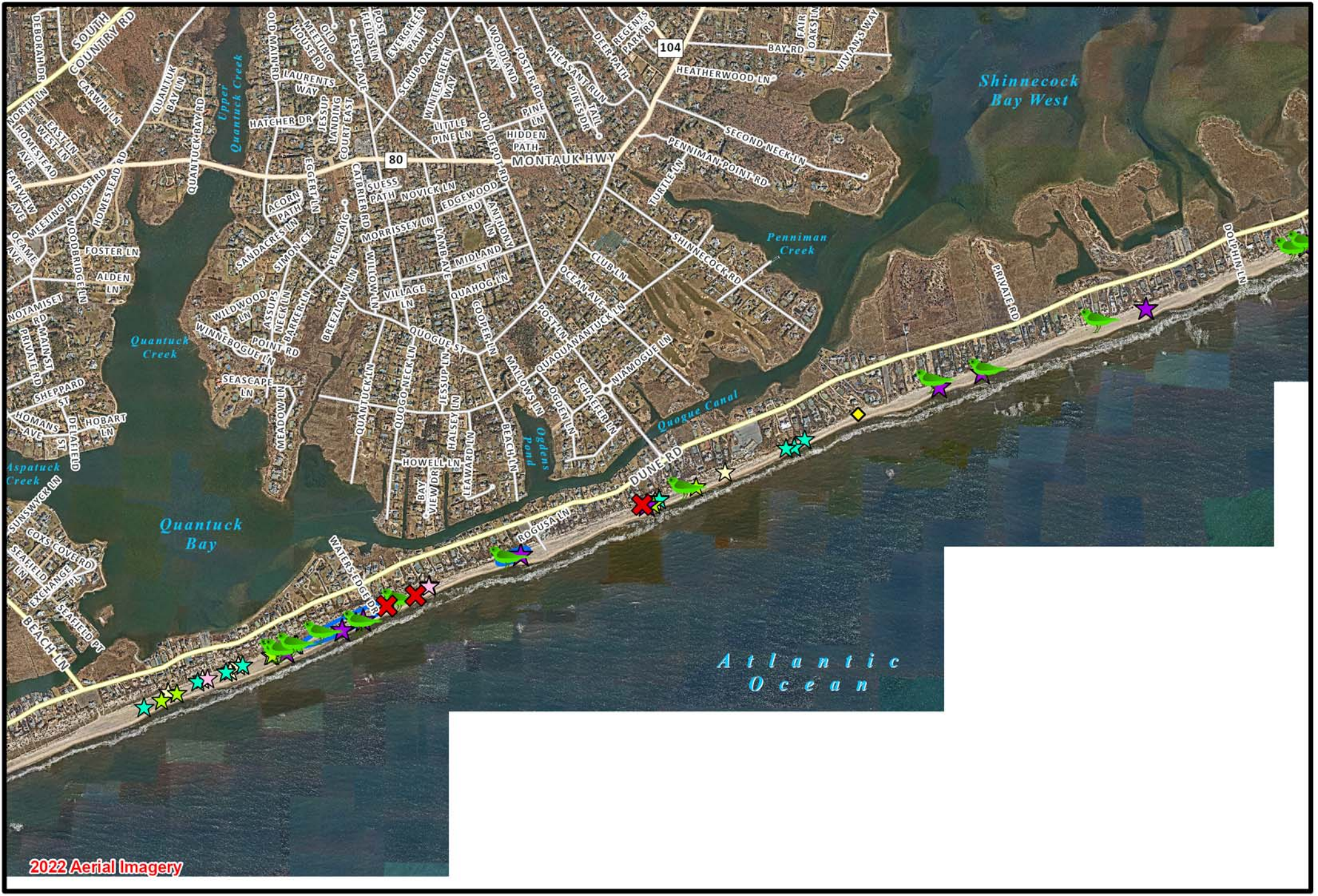
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023

0 500 1,000 2,000 3,000 4,000 Feet

HAMPTON BEACH

Village of Quogue

2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony




N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 210 420 840 1,260 1,680 Feet
LONG BEACH
Noyac / Sag Harbor
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Noyac Bay
Sag Harbor Cove
Staff Paynes Creek
Upper Sag Harbor Cove
LONG BEACH RD
60
PARK ACCESS RD
HARBOR DR
COVES END LN
CLIFF DR
RIDGE DR
WINDERMERE DR
SUNSET DR
COVE DR
WHALERS WALK
BAY VIEW DR EAST
DARTMOUTH RD
CORNELL RD
REDWOOD RD
AMHERST RD
PRINCETON RD
NOTRE DAME RD
WHITNEY RD
CRESCENT ST
NOYACK RD
BUTCHER
SPRING LN
2022 Aerial Imagery

N

Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023

0 75 150 300 450 600 Feet

MESCHUTT BEACH

Hampton Bays

2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony


N
Prepared by:
Town of Southampton Division of Geographic
Information Systems October 2023
0 50 100 200 300 400
Feet
MIDDLE POND
Shinnecock Hills
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
BAYBERRY COVE LN
FAR POND RD
Far Pond
Honey Pot
Middle Pond
Shinnecock
Bay East
2022 Aerial Imagery

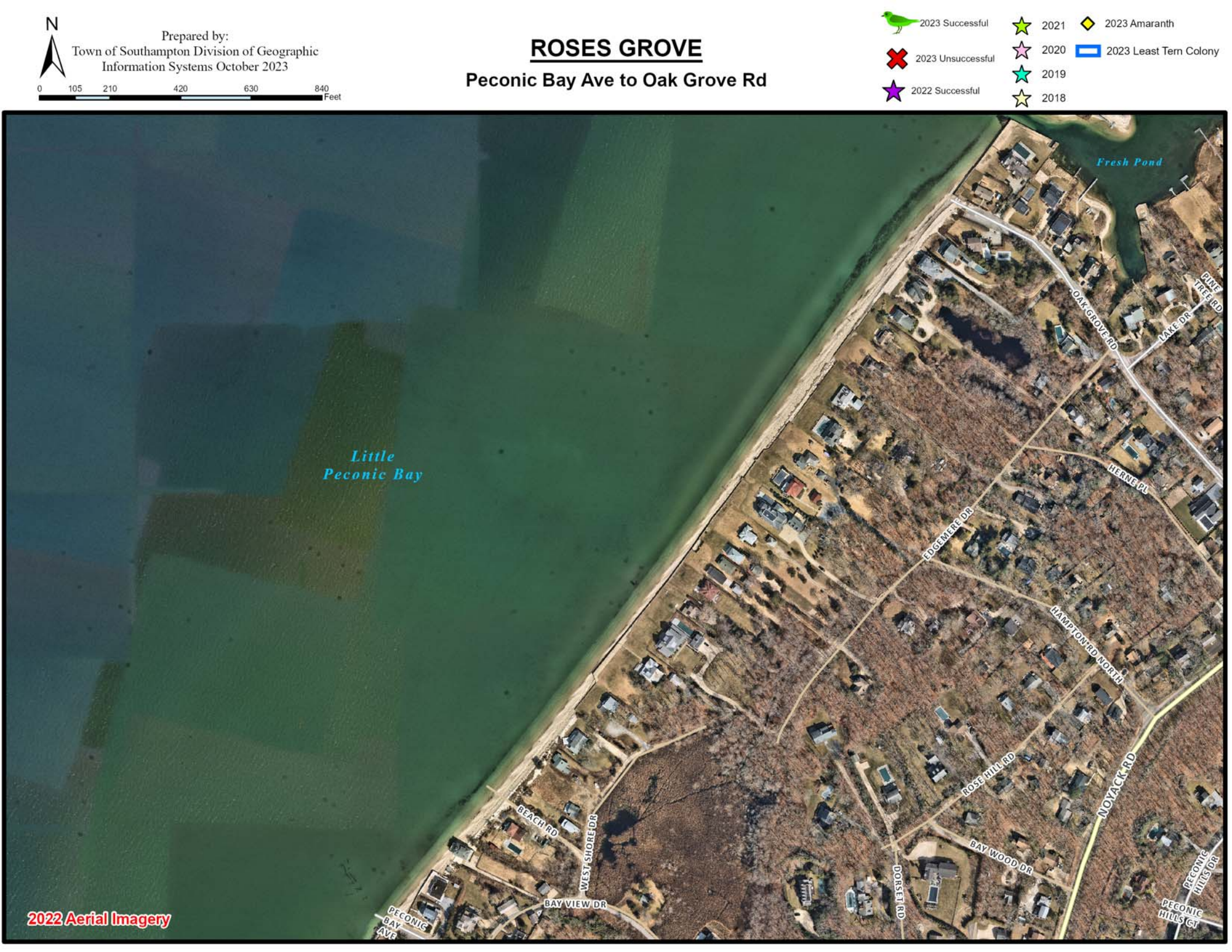

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 180 360 720 1,080 1,440 Feet
OLD TOWN ROAD (VILLAGE)
Old Town Rd to Fowlers St
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
NARROW LN
WICKAPOGUE RD
PHEASANT CLOSE EAST
PHEASANT LN
BEACHCOMBER LN
FOWLER ST
Jule Pond
Little Jule Pond
Phillips Pond
OLDE TOWNE LN
MURRAY PL
BARONS LN
SQUABBLE LN
DUCK POND LN
Wickapogue Pond
MURRAY LN
OLD TOWN RD
Old Town Pond
GIN LN
WYANDANCH LN
Atlantic Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 130 260 520 780 1,040 Feet
PINE NECK / MILL CREEK
Noyac
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Noyac Bay
Mill Creek
HAMPTON RD
PRIVATE RD
OAK ST
CEDAR ST
MAPLE ST
RIGHT OF WAY (NOYACK AVE)
PINE RD
OAK RD
NOYACK AVE
BRIAR LN
PINE NECK AVE
CHESTNUT ST
POPLAR ST
BIRCH ST
WALNUT ST
DOGWOOD ST
NOYACK BAY AVE
BERNARD PL
OAK DR NORTH
TREDWELL LN
LOCUST LN
BEACH PLUM RD
MILL RD
HARRYS LN
MUNCHOGUE DR
BURKESHIRE DR
NOYACK RD
NORTHVIEW DR
OAK DR
2022 Aerial Imagery

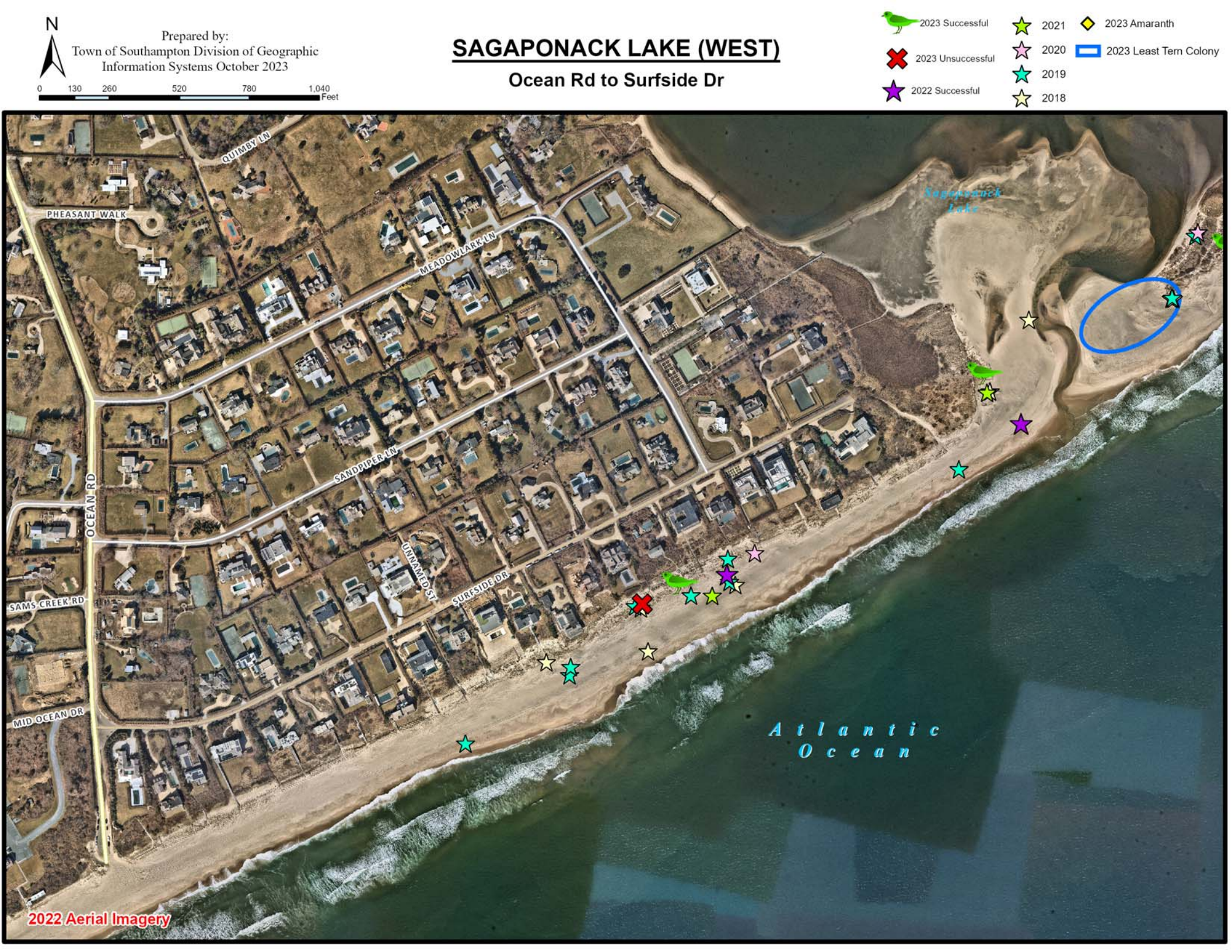

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 155 310 620 930 1,240 Feet
PONQUOGUE BEACH
Hampton Bays
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Shinnecock Bay East
Shinnecock Bay West
PONQUOGUE BRIDGE
32B
OLD PONQUOGUE BRIDGE
DUNE RD
ROAD I
ROAD K
Atlantic Ocean
2022 Aerial Imagery

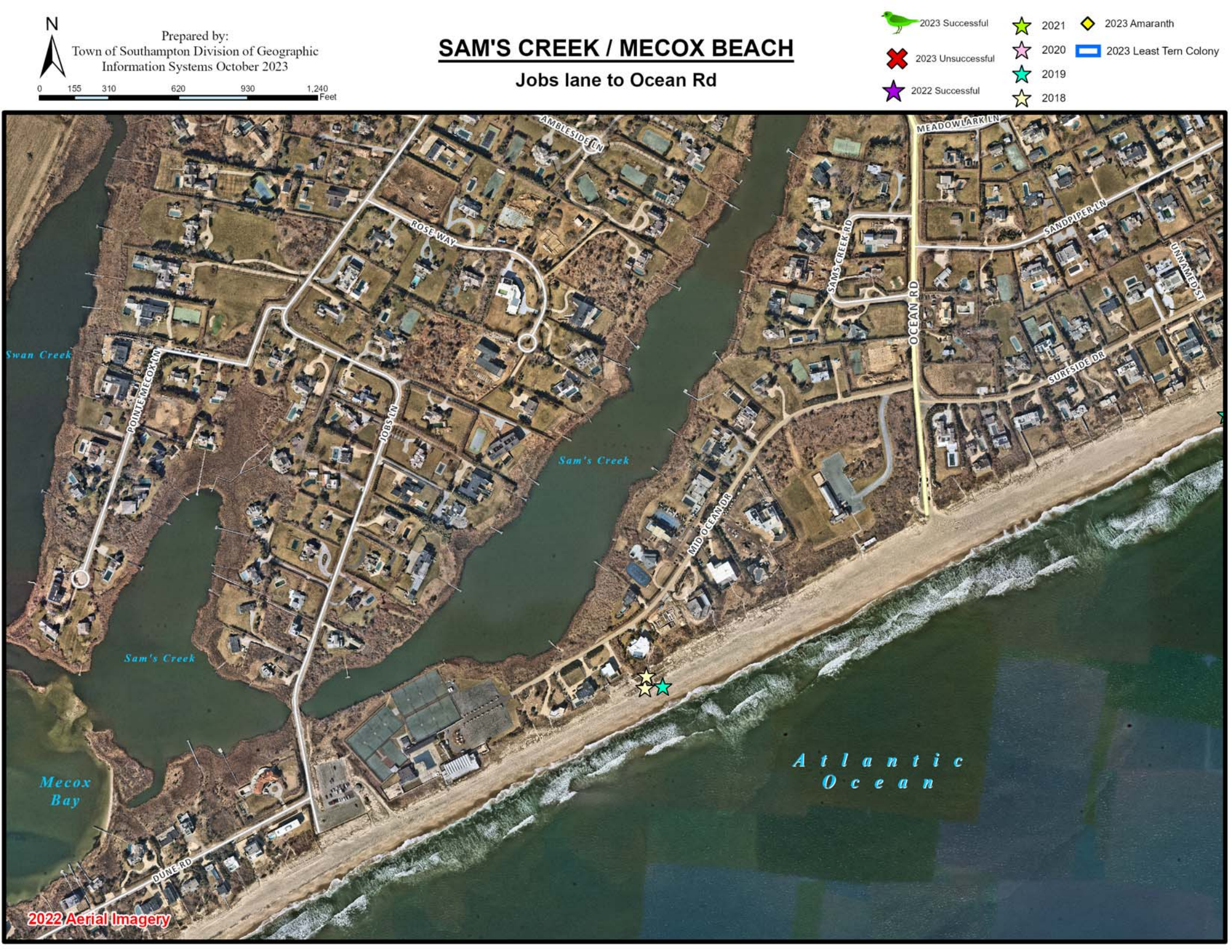

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 50 100 200 300 400 Feet
RED CEDAR POINT
Flanders
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Flanders Bay
Great Peconic Bay
The Cow Yard
BARRETT DR NORTH
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic
Information Systems October 2023
0 75 150 300 450 600
Feet
RED CREEK POND
Hampton Bays
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Great
Peconic Bay
Red
Creek
Pond
Fourniers
Pond
RED CREEK PARK
GATHERING ROCKS RD
2022 Aerial Imagery

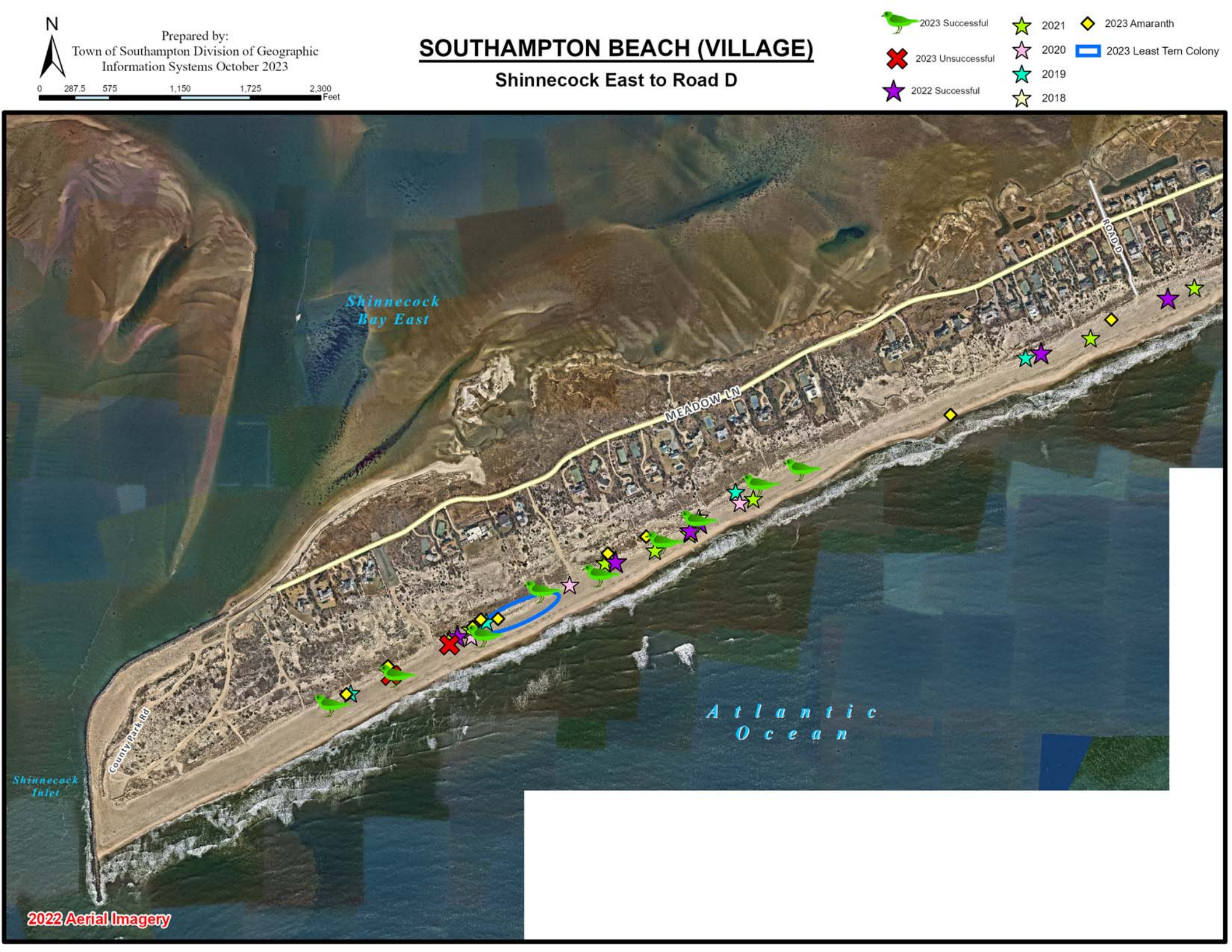

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 105 210 420 630 840 Feet
ROSES GROVE
Peconic Bay Ave to Oak Grove Rd
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Little Peconic Bay
Fresh Pond
OAK GROVE RD
LAKE DR
PINE TREE RD
HERNE PL
EDGEMERE DR
HAMPTON RD NORTH
ROSE HILL RD
NOYACK RD
BEACH RD
WEST SHORE DR
BAY VIEW DR
PECONIC BAY AVE
BAY WOOD DR
DORSET RD
PECONIC HILLS DR
PECONIC HILLS CT
2022 Aerial Imagery

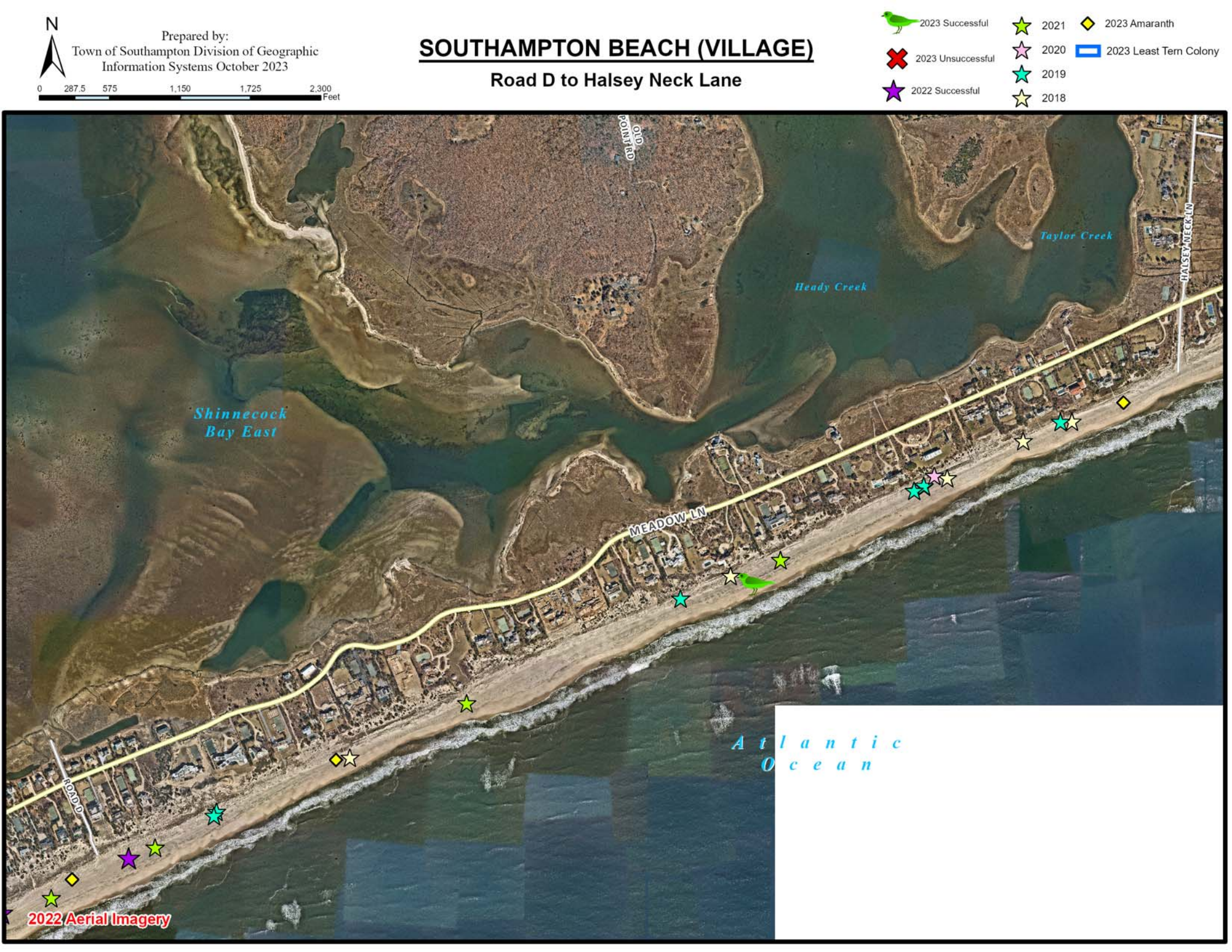

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 180 360 720 1,080 1,440 Feet
SAGAPONACK LAKE (EAST)
Sagg Main St to Gibson Ln
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
BRIDGE LN
SAGAPONACK MAIN ST
SAGG POND CT
SEASCAPE LN
TREES LN
GIBSON LN
CRESTVIEW LN
ROW OFF GIBSON LN
SANDUNE CT
Sagaponack Lake
Atlantic Ocean
SURFSIDE DR
2022 Aerial Imagery

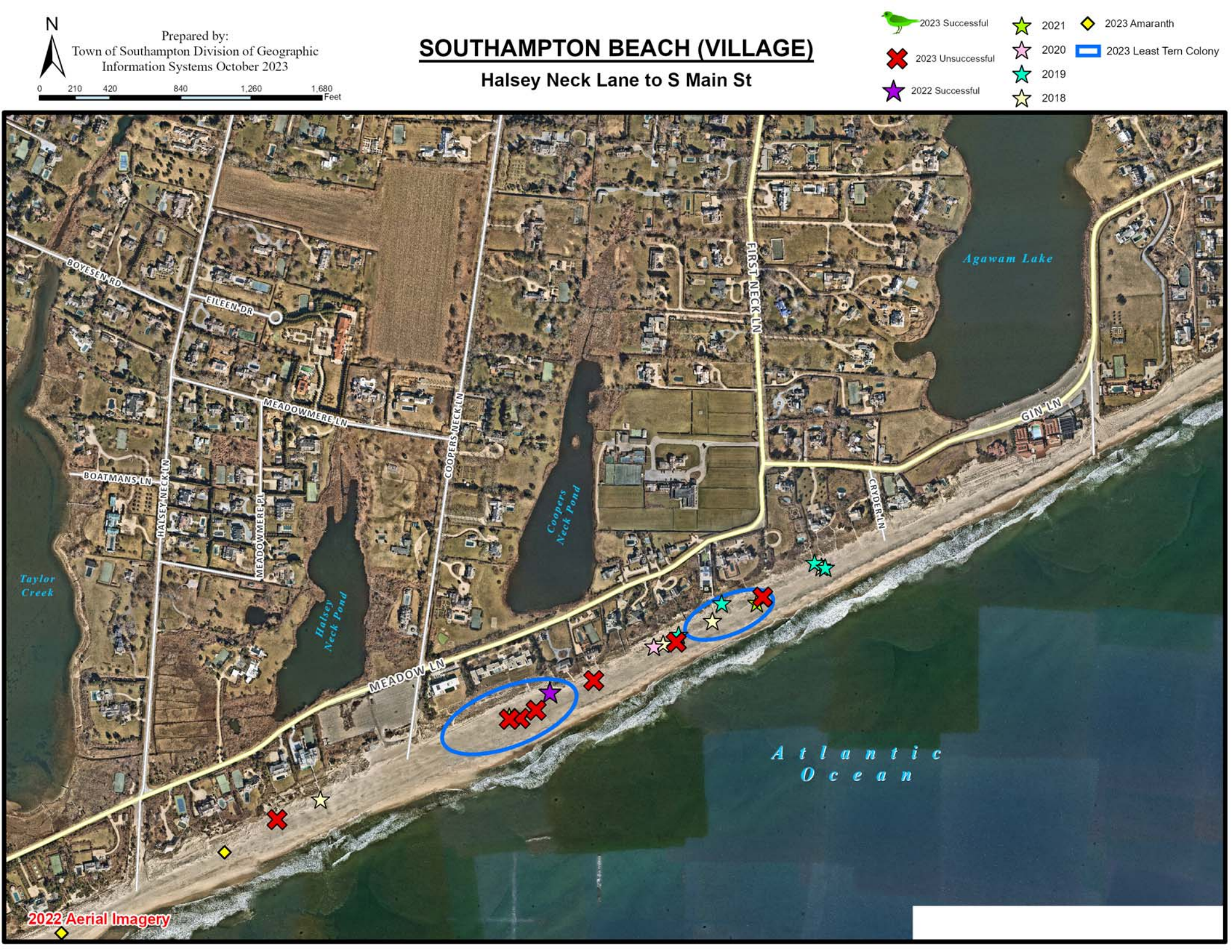

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 130 260 520 780 1,040 Feet
SAGAPONACK LAKE (WEST)
Ocean Rd to Surfside Dr
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
QUIMBY LN
PHEASANT WALK
MEADOWLARK LN
SANDPIPER LN
OCEAN RD
UNNAMED ST
SURFSIDE DR
SAMS CREEK RD
MID OCEAN DR
Sagaponack Lake
Atlantic Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 155 310 620 930 1,240 Feet
SAM'S CREEK / MECOX BEACH
Jobs lane to Ocean Rd
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
AMBLESIDE LN
ROSE WAY
MEADOWLARK LN
SANDPIPER LN
SAMS CREEK RD
OCEAN RD
UNNAMED ST
SURFSIDE DR
POINTE MECOX LN
JOBS LN
MID OCEAN DR
DUNE RD
Swan Creek
Sam's Creek
Sam's Creek
Mecox Bay
Atlantic Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic
Information Systems October 2023
0 105 210 420 630 840
Feet
SHORT BEACH
North Haven / Noyac
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
SUNSET BEACH RD
COX'S WALK
TYNDALL RD
MAUNAKEA ST
114
SEAGULL HILL RD
Poules Creek
1ST ST
SHORT BEACH RD
COVE RD
2ND ST
Noyac
Bay
60
3RD ST
COVE VIEW RD
COVES END LN
LONG BEACH RD
Sag Harbor
Cove
2022 Aerial Imagery

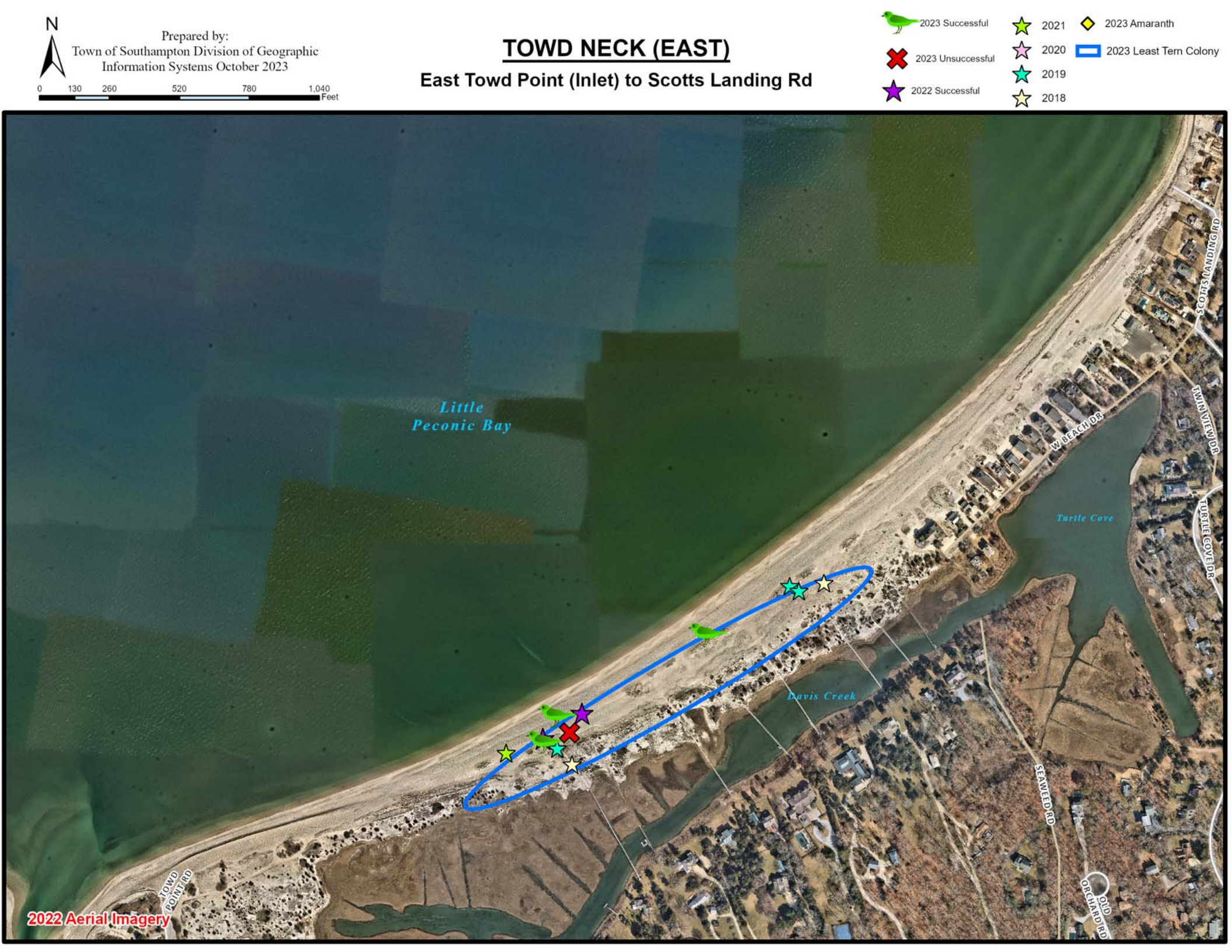

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 287.5 575 1,150 1,725 2,300 Feet
SOUTHAMPTON BEACH (VILLAGE)
Shinnecock East to Road D
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Shinnecock Bay East
MEADOW LN
ROAD D
Atlantic Ocean
County Park Rd
Shinnecock Inlet
2022 Aerial Imagery

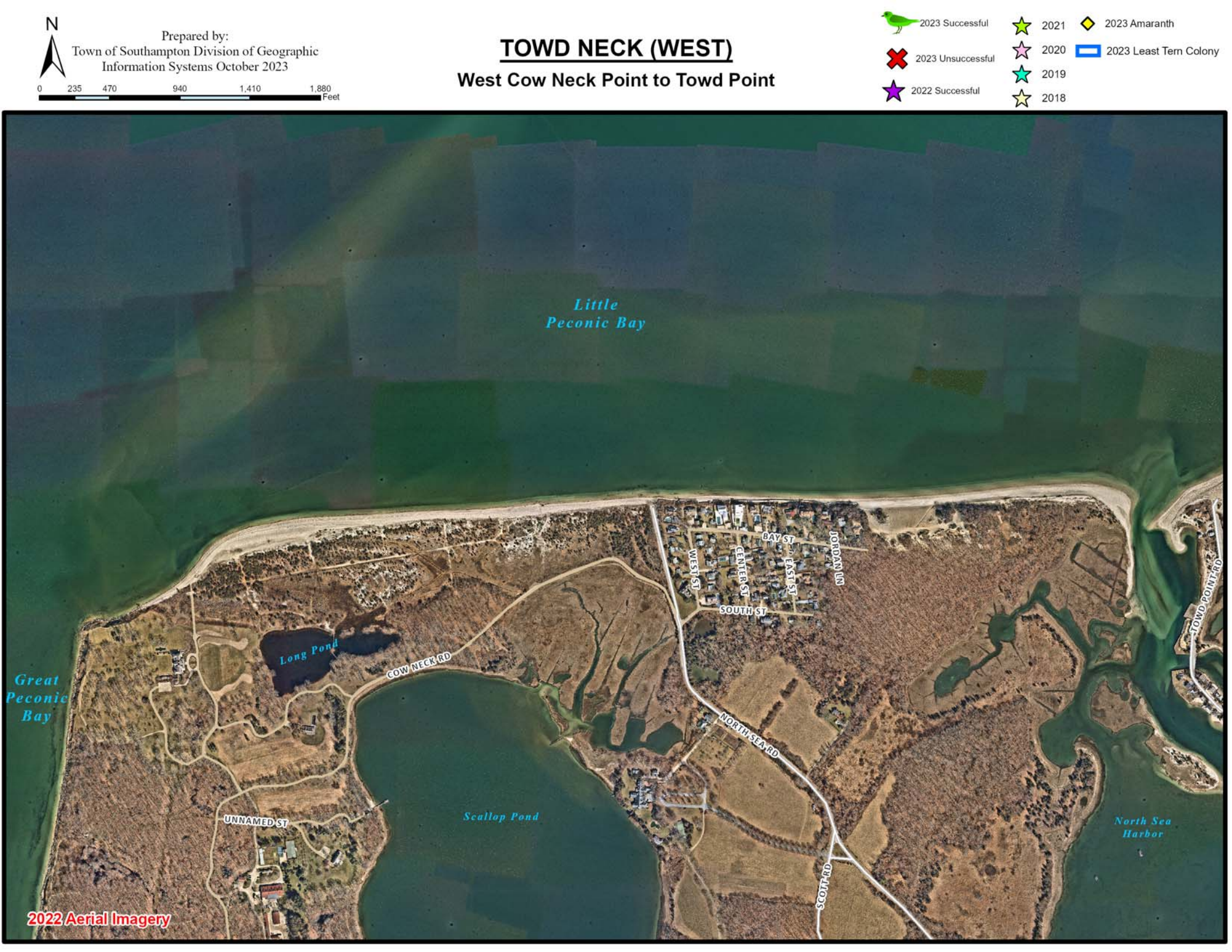

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 287.5 575 1,150 1,725 2,300 Feet
SOUTHAMPTON BEACH (VILLAGE)
Road D to Halsey Neck Lane
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
OLD POINT RD
Taylor Creek
Heady Creek
HALSEY NECK LN
Shinnecock Bay East
MEADOW LN
ROAD D
Atlantic Ocean
2022 Aerial Imagery

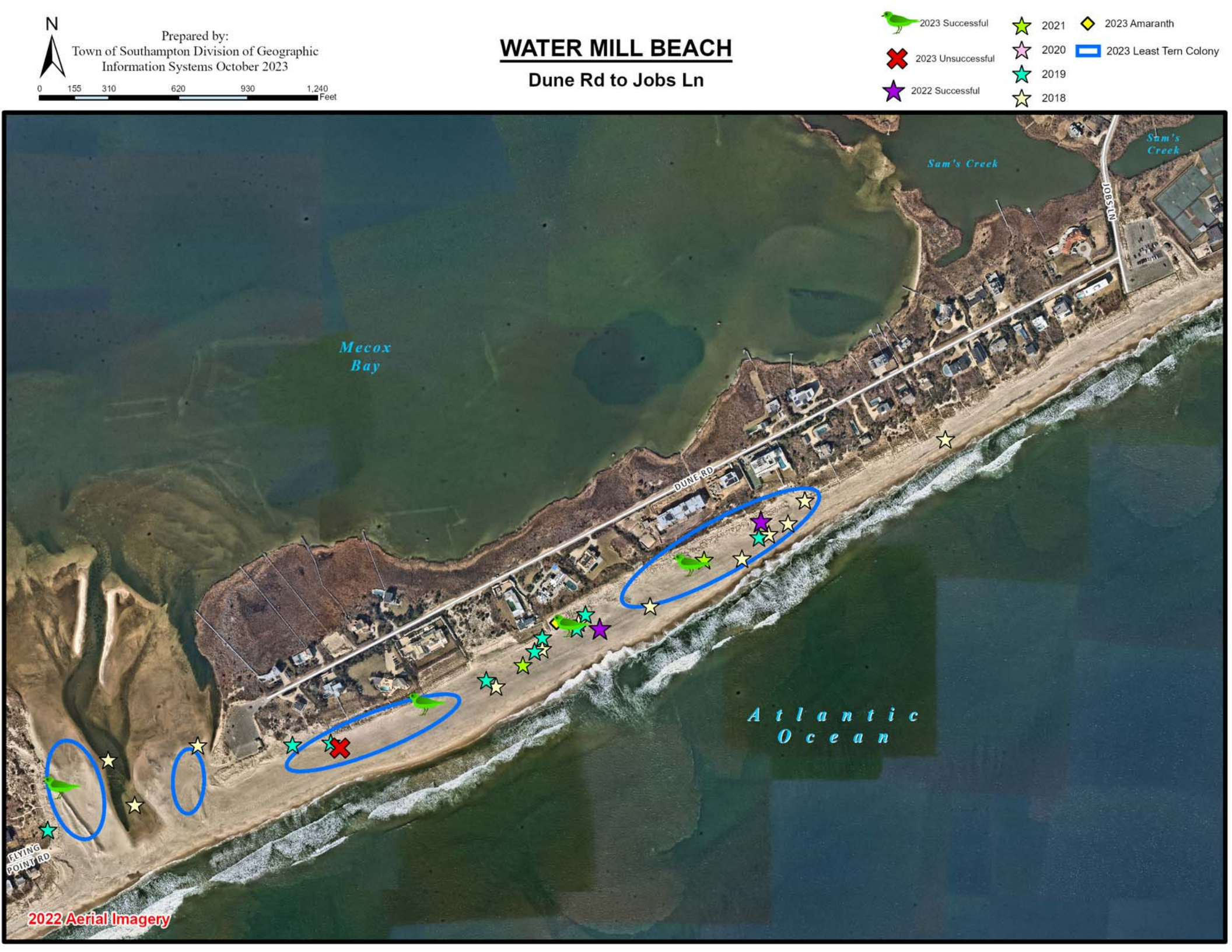

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 210 420 840 1,260 1,680 Feet
SOUTHAMPTON BEACH (VILLAGE)
Halsey Neck Lane to S Main St
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
BOYESEN RD
EILEEN DR
MEADOWMERE LN
BOATMANS LN
HALSEY NECK LN
MEADOWMERE PL
COOPERS NECK LN
FIRST NECK LN
GIN LN
CRYDER LN
MEADOW LN
Agawam Lake
Coopers Neck Pond
Halsey Neck Pond
Taylor Creek
Atlantic Ocean
2022 Aerial Imagery

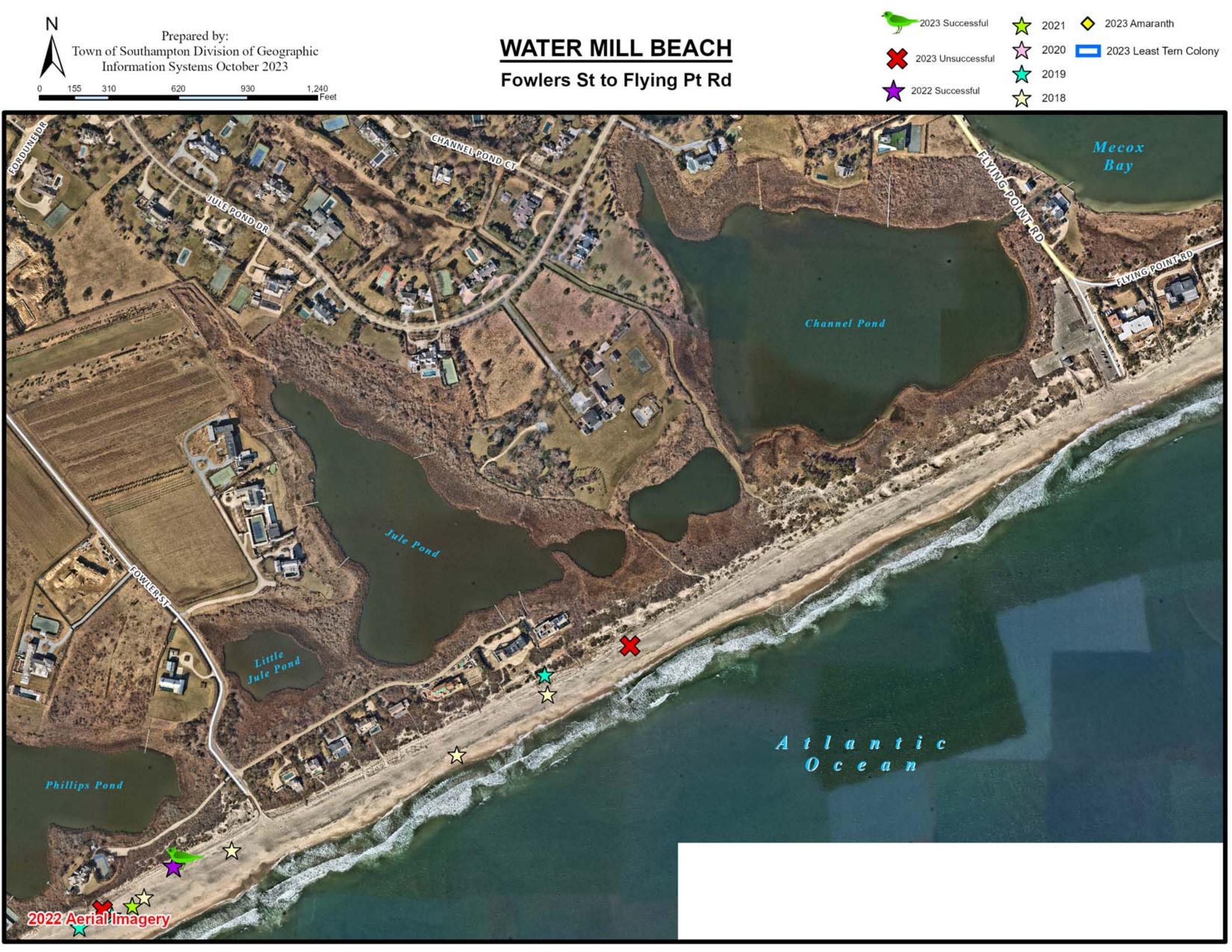

N
Prepared by:
Town of Southampton Division of Geographic
Information Systems October 2023
0 75 150 300 450 600
Feet
SQUIRES POND
Hampton Bays
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
WEST LANDING RD
PINE PL
PETREL LN
RIDGEWAY RD
LEANDER TER
Great
Peconic Bay
Squires Pond
EAST LANDING RD
SQUIRES TER
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic
Information Systems October 2023
0 287.5 575 1,150 1,725 2,300
Feet
TIANA BEACH
Hampton Bays
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Shinnecock
Bay West
IRITON LN
DUNE RD
MERMAID LN
PRIVATE RD
DOLPHIN LN
Atlantic
Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 130 260 520 780 1,040 Feet
TOWD NECK (EAST)
East Towd Point (Inlet) to Scotts Landing Rd
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Little Peconic Bay
Turtle Cove
Davis Creek
W BEACH DR
TWIN VIEW DR
TURTLE COVE DR
SCOTTS LANDING RD
SEAWEED RD
OLD ORCHARD RD
TOWD POINT RD
2022 Aerial Imagery

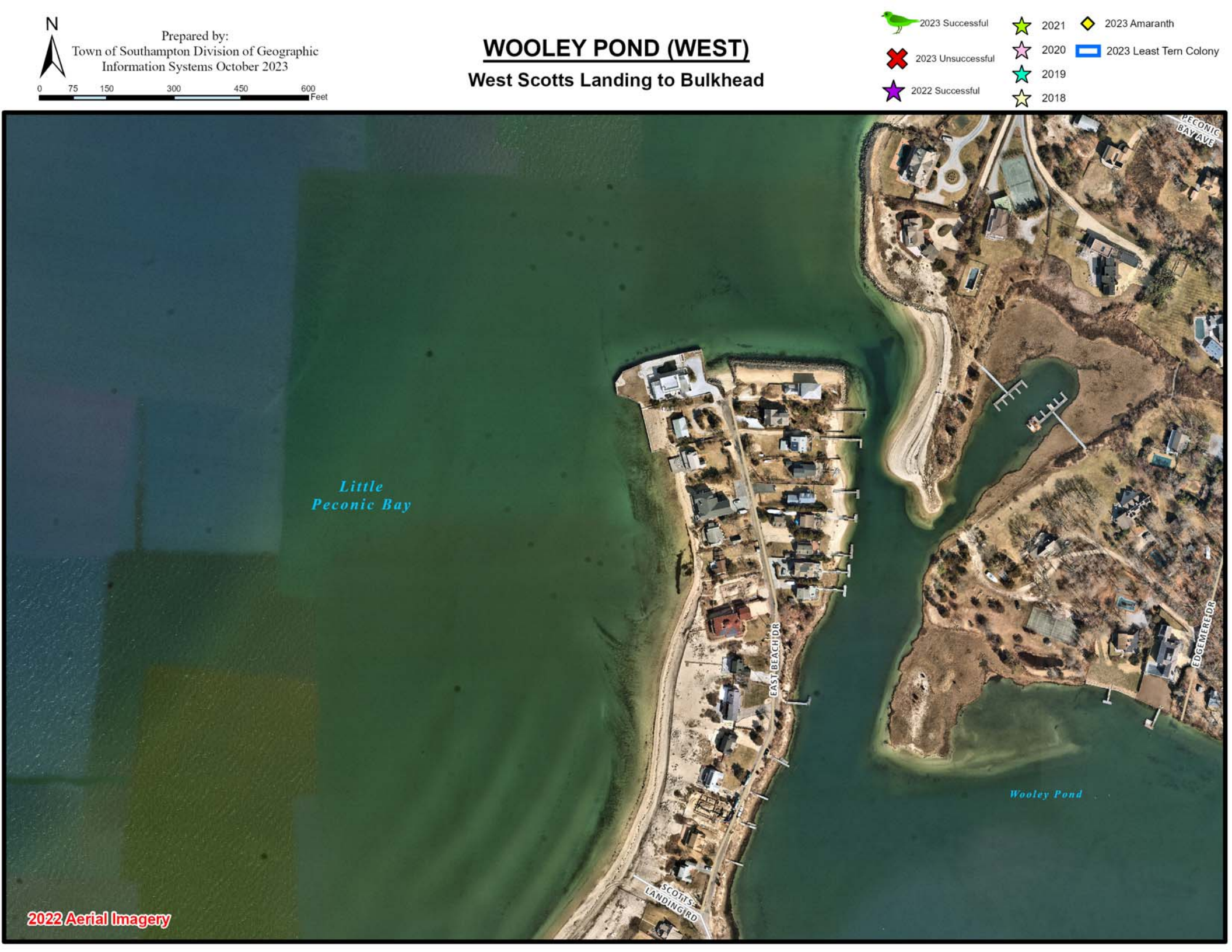

N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 235 470 940 1,410 1,880 Feet
TOWD NECK (WEST)
West Cow Neck Point to Towd Point
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Little Peconic Bay
Great Peconic Bay
Long Pond
Scallop Pond
North Sea Harbor
COW NECK RD
NORTH SEA RD
SCOTT RD
UNNAMED ST
SOUTH ST
BAY ST
WEST ST
CENTER ST
EAST ST
JORDAN LN
TOWD POINT RD
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 155 310 620 930 1,240 Feet
WATER MILL BEACH
Dune Rd to Jobs Ln
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Sam's Creek
Sam's Creek
JOBS LN
Mecox Bay
DUNE RD
Atlantic Ocean
FLYING POINT RD
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 155 310 620 930 1,240 Feet
WATER MILL BEACH
Fowlers St to Flying Pt Rd
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
FORDUNE DR
JULE POND DR
CHANNEL POND CT
FLYING POINT RD
FLYING POINT RD
Mecox Bay
Channel Pond
Jule Pond
FOWLER ST
Little Jule Pond
Phillips Pond
Atlantic Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 105 210 420 630 840 Feet
WATER MILL BEACH
Flying Point Rd to Dune Rd
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Mecox Bay
Burnets Cove
BURNETTS COVE RD
FLYING POINT RD
FLYING POINT RD
Atlantic Ocean
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 25 50 100 150 200 Feet
WOOLEY POND (EAST)
East/North Point to Peconc Bay Ave
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
PECONIC BAY AVE
Little
Peconic Bay
2022 Aerial Imagery


N
Prepared by:
Town of Southampton Division of Geographic Information Systems October 2023
0 75 150 300 450 600 Feet
WOOLEY POND (WEST)
West Scotts Landing to Bulkhead
2023 Successful
2023 Unsuccessful
2022 Successful
2021
2020
2019
2018
2023 Amaranth
2023 Least Tern Colony
Little Peconic Bay
Wooley Pond
EAST BEACH DR
SCOTTS LANDING RD
PECONIC BAY AVE
EDGEMERE DR
2022 Aerial Imagery