

Long Island Steward Training Manual for Threatened and Endangered Species



2018



In Cooperation with the New York State Office of Parks, Recreation, and Historic Preservation

Long Island Steward Training Manual for Threatened & Endangered Species 2017

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Section 1- Introduction



Adult Piping Plover

- *Introduction*
- *Acknowledgments*
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INTRODUCTION

This manual is designed to introduce individuals to the piping plover and other Federal and State beach dependent listed species recovery efforts on Long Island, New York. Materials covered in this manual include piping plover, least tern, roseate tern, common tern, seabeach amaranth, seabeach knotweed biology and monitoring recommendations. The guidelines for species management, specifically piping plovers, on recreational beaches are also included.

For more information visit the following websites:

<http://nyfo.fws.gov>

www.fws.gov

www.dec.state.ny.us

www.tnc.org

Please Note:

The attached steward training manual is intended as companion reference material for the Long Island Steward Training for Threatened and Endangered Species Workshop presented by the Long Island Field Office of the Service, in partnership with The Nature Conservancy and the New York State Department of Environmental Conservation. No one should monitor or manage threatened or endangered species without: attending the workshop; receiving approval from the landowner/land manager; and having on-site training from an experienced steward. Contact Steve Sinkevich or Steve Papa of the Long Island Field Office @ 631-286-0485 for further information.

ACKNOWLEDGMENTS

This training manual would not have been made possible without help from The Nature Conservancy, Long Island Chapter (Joe Janssen); New York State Department of Environmental Conservation, Regions I & II (Dan Rosenblatt, Michelle Gibbons, Marcelo del Puerto); USFWS Law Enforcement (Special Agents Sam LiBrandi, Nancy Hillary); and USFWS (Anne Hecht, Steve Sinkevich, Steve Papa). The Nature Conservancy developed the concept, and first copy, of a training manual for piping plover stewards. The New York State Department of Environmental Conservation provided updated data sheets, maps, and editing for this edition. Agent Hillary provided expertise on the Law Enforcement Training Manual. Anne Hecht, recovery coordinator for the Atlantic Coast population of piping plovers, contributed to the final draft. Thanks also to those who spent much time and energy putting together the countless numbers of manuals used for each year's training sessions.

FEDERAL, STATE, AND LOCAL CONTACTS

FEDERAL

DEPARTMENT OF THE INTERIOR

U.S. Fish and Wildlife Service (USFWS)

Piping Plover Recovery Team Leader Anne Hecht..... (978) 443-4325
Ecological Services (Long Island Field Office) (631) 286-0485
Biologists Steve Sinkevich, Steve Papa
Law Enforcement (Valley Stream) (516) 825-3950
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Long Island National Wildlife Refuge Complex
Michelle Williams (631) 286-0485

National Park Service (NPS)

Fire Island National Seashore
Lindsay Ries..... (631) 687-4768
Gateway National Recreation Area
Doug Adamo (718) 354-4510

DEPARTMENT OF THE ARMY

U.S. Army Corps of Engineers (Corps)

Robert Smith (917) 790-8729
To report banded plovers:
Rosemary Vander Lee (piping.plover@usace.army.mil) (402) 667-7873 x3336

STATE

New York State Department of Environmental Conservation (NYSDEC)

Bureau of Wildlife
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Law Enforcement (8:30 a.m. - 4:45 p.m.)
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New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP)

Annie McIntyre (Connetquot River State Park) (631) 581-1072

CITY

New York City Department of Parks and Recreation

Richard Simon (Urban Park Rangers) (212)360-1408

COUNTY

Suffolk County (Dept. of Parks, Recreation, and Conservation)

Nick Gibbons, Diana Sanford (631) 854-4981

LOCAL

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Vincent Biondo (Dept. of Environmental Control) (631) 422-7649

Town of Brookhaven

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Matt Lankowicz (Dept. of Environment & Waterways) (631) 360-7514

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James Duryea & John Papajohn (Town Trustees)..... (631) 287-5717

PRIVATE

The Nature Conservancy - Long Island Chapter (TNC)

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Citizens Campaign for the Environment

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Section Two

Monitoring Techniques



Adult Piping Plover

- *Role as a Steward*
- *Recommended Management & Monitoring Techniques – The Nature Conservancy*
- *Recommended Monitoring Techniques for Terns and Skimmers – The Nature Conservancy*
- *Safety Considerations*

Your Role as a Steward

Your role as a steward is an important one, and one that will require certain knowledge and skills to perform well. It is the goal of this training session to ensure that you are provided with a fundamental understanding of what is required of you. It will then be up to you to use your knowledge of piping plovers and terns, and the ecosystem that they are a part of, to protect these species on your assigned beaches. You will also report on the reproductive success of the birds you monitor as well as events and conditions that affect productivity on your beaches. Specifically, you will be asked to perform the following duties and activities:

1. Protection of tern and plover nesting areas:

- Protect nesting areas from recreational beach-goers with symbolic fencing and signs, explaining the need for protection.
- Protect individual piping plover nests from predation with predator exclosures when available evidence indicates predation of plover eggs is likely as outlined.

2. Monitor plover and tern populations:

- Gather the data requested on each site visit (found on the Daily Visit form).
- Make general observations on the condition of the site that you think may be of importance to the present or future viability of the site (e.g. is the beach severely eroded, heavily-used for recreation, etc.).
- Check and maintain all fencing, signs, and exclosures, on each visit to the site to make sure that they are in good shape.

3. Monitor human activities on nesting beaches:

- Record your observations of unsanctioned activities, such as driving on the beach, unleashed dogs, and other activities that you think may be harmful or disruptive to terns, plovers, and other species of concern.
- Report activities and events that are potentially disruptive to breeding birds to the appropriate authority.

4. Public outreach:

- Interact with beach-users. Answer questions: explain why plovers and terns are endangered and what is being done to facilitate their recovery. Explain to beach-goers what symbolic fencing is for and encourage them to respect these protected areas, keep dogs leashed, etc.

5. Provide information on the presence, locations, and status of plover populations to the proper land-owning agency or organization (in most cases, this would be the agency or organization that you work for).

Remember the following:

1. Your job is not law enforcement.
 - If a situation appears confrontational, remove yourself from the situation and contact law enforcement officers.
 - In the case of take, you can serve as a valuable witness and record important information. However, this should be the extent of your involvement.
 - In all cases, you should follow the protocol established for the type of incident you are involved in.

2. Your job is an important one. Your actions will have an important effect on the overall success of the pairs that nest on your beach. Since you are regularly on the beach, you are the person in the best position to make a beneficial impact on the productivity of the birds. You will be the on-site naturalist, observer and recorder of data, environmental educator, and liaison between your agency or organization and the general public. Your dedication will help make the upcoming breeding season a successful one.

MONITORING TECHNIQUES

PLOVER CODE by Meryl Goldin

- I. Be very quiet and never disturb or harass a plover intentionally.
- II. Never walk through a plover nesting area without first looking where you place each and every foot.
- III. Record data simply and meticulously.

KEY POINTS

1. Expect the unexpected.
2. Help plovers succeed in their first nesting attempt.
3. Monitor plovers from 50-75 meters (50-75 paces) to minimize disturbance.
4. Nest visits should be infrequent.
5. Do not check nest if potential avian predators are anywhere in the vicinity.
6. Do not check nests if beach visitors can see you.
7. Do not disturb or harass the plovers.
8. Watch the birds' behavior (sit-wait-watch).
9. Territory establishment and courtship displays = aerial displays, horizontal threat displays, territorial boundary disputes, etc.
10. Look for plover tracks (toes are ½ inch long; three toes register, extremely pigeon-toed; each print is separated by 2-3 inches).
11. Conduct surveys at the high tide line.
12. Copulation = imminent clutch, copulate throughout egg-laying.
13. Lay one egg every other day.
14. Incubation begins usually when the last egg is laid.
15. Each bird incubates for approximately 45-60 minutes.
16. Incubation lasts approximately 27-28 days.
17. Plovers are typically monogamous within a season.

18. Plover family groups may move great distances (a quarter of a mile is not uncommon).
19. Easiest to locate and count chicks during early morning or early evening hours.
20. Gain familiarity with the various plumages of different-aged chicks.
21. The female may leave her mate and chicks before they are fledged.
22. Do not try to reestablish family groups (parent plovers know best how to raise plover chicks).
23. Some plovers seem to habituate to human presence, some do not.



Monitoring Terns & Skimmers

Monitoring terns and skimmers can be a frustrating task. Terns and skimmers are colonial nesters; however, sometimes the “colony” can be quite dispersed, spread out over a large area. Some suggestions when attempting tern and skimmer counts:

- Nest counts do not need to be done, as they may cause unnecessary, frequent disturbance to the colony.
- When conducting adult counts, observations should be made from outside the colony.
- If the colony is disturbed as you approach, back off and allow the birds to settle down.
- Count the number of birds “incubating” or sitting to get an *estimation* of nests.
- Count the number of birds observed in the air over the colony, acting in a defensive manner. Add to the number of sitting birds for an *estimated* adult count.
- Avoid counting birds that appear to be loafing, particularly at the water’s edge, acting indifferent (non-defensive) to your presence. These birds are not likely part of the colony you are counting.
- If you have a large spread-out colony, count the birds between landmarks or fence-posts of your symbolic fencing. For example, count all the birds between posts #1-5, #6-10, etc. Remember that your count is an *estimate*.
- If possible, conduct counts with two or more people. Individually count the number of birds observed sitting and in the air, then compare counts. Repeat counts if necessary to rectify discrepancies.

Once chicks are present, the counting becomes even more difficult. The chicks are hard to see, often hiding in beachgrass until their parent returns with a fish. Some suggestions when attempting chick counts:

- Chick counts should be conducted from outside the colony.
- Be patient, the old sit-wait-watch approach works well when counting chicks.
- Chicks will be visible, particularly as adults feed them.
- As with adult counts, utilize landmarks if you have a large, spread-out colony.
- If possible, conduct chick counts with two or more people.

Fledge counts can easily be overestimated. Young terns may move from site to site as they prepare for migration. Some suggestions when attempting fledge counts:

- Often adults will continue to defend fledged or nearly fledged young. Use this to assist you in determining if fledges are part of the colony.
- Remember your chick counts. If the maximum number of chicks you had within a colony was 10 and you suddenly have 30 fledges on site, assume the majority of these birds are from another site.
- Remember the ages of chicks observed on site. Use this to gauge whether or not fledges observed are actually from nests on site.
- Use your best judgment. Remember that this is an *estimate*.

Safety Considerations for Piping Plover Stewards

There are several safety considerations that you should keep in mind while working as a piping plover steward. These considerations address environmental exposure and the equipment or tools that you will be using.

Environmental Exposure:

The beach can be a very inhospitable place. Sun, heat, wind, sand, and salt spray can combine to create uncomfortable or even dangerous conditions. Weather can change rapidly, so it is important to dress accordingly and pay attention to weather reports.

Wind Chill - Wind chill occurs through accelerated convection heat loss from exposed skin. Although temperatures away from the beach may be pleasant, it may feel very cold on the beach due to wind chill. It is not unusual for there to be a 20°F difference between temperatures at the beach and those away from the beach. Long exposure to strong wind chill conditions can lead to hypothermia. Rain or salt spray will exacerbate wind chill conditions.

You should be extra cautious of wind chill during April, May, and September or if working after sundown. A good rule to follow is to wear long pants, a long-sleeved shirt, and a hat. A jacket that offers at least some protection from the rain is a good idea. Bulky, water-proof gear, however, will feel uncomfortable compared to light Gore-tex or other synthetic rain gear. In addition, plan on having an extra layer of clothing available in case of inclement weather. Synthetic fleece sweaters provide good insulation and are lightweight, pack tightly, and are water-resistant. Sun-glasses are also highly recommended for UV and glare protection as is sunburn protection with a minimum of 30 SPF.

Heatstroke - Heatstroke occurs when the body's normal temperatures begin to rise. Sweating is our primary method of staying cool. For this reason, it is crucial to have plenty of water to drink. In high temperatures, you should consume at least a quart of water in an hour.

Working with Fencing Equipment:

You will be using several tools to put up symbolic and snow fencing and enclosures. Some of these tools can be dangerous if proper precautions are not taken. The six-foot-tall metal posts that are used for fencing have very sharp edges. You should wear gloves with leather palms whenever handling posts.

Posts are driven into the ground with either post-drivers or sledge-hammers. Post-drivers are the safer alternative. These drivers weigh approximately 19 pounds. It is important to wear gloves and hiking boots whenever using post-drivers. Also, enclosure wire should be cut close to the joints to minimize the chances for any punctures.

Often, you will need to cut string or the tie wraps that are used to attach signs to the posts. You may use either cutting pliers or a knife for this purpose. Knives and cutting pliers can be dangerous. Cutting pliers can pinch your skin when closed. Examine your model to determine its potential for skin-pinching. If using a folding knife, keep the blade sharp and the mechanism well-oiled. Use a knife with a locking blade, to prevent the knife blade from folding back on you. Never put down or store an open knife, even if it is only for a short time.

Protection from Mosquitoes and Ticks:

Mosquitoes can be abundant in wet back-dune areas. Ticks can be found in the dunes or may even be blown by the wind. Although the hazard from these is not great, you will want to exercise certain cautions.

The dog tick and the deer tick are the two species encountered on Long Island beaches. The female deer tick can transmit Lyme disease. Male ticks do not consume blood and therefore cannot transmit Lyme disease. If you find a tick on you, chances are it is a male dog tick waiting for a female tick to breed. Although these male ticks cannot transmit the disease, you should be cautious and treat every tick as a potential disease vector.

The salt marsh mosquito is the most abundant species in coastal habitats. You can protect yourself from mosquitoes by wearing a long-sleeved shirt and pants and by applying insect repellent. Mosquito repellent containing DEET should not be applied directly to the skin, but used on hats, shirts, and pants.

Suggested Plover Equipment:

Hat	Field Guides
Work/Hiking Boots	Camera
Sunscreen	Tape Measure (25' or 50')
Sunglasses	String and Survey Tape
Cutting Pliers	Knife with locking blade
Gloves	Emergency Contact list
Compass	Binoculars/Spotting Scope
Camera	First Aid Kit (in vehicle)
Water	Insect Repellent
Writing Implements	Field Notebook
Change of Clothes (in vehicle)	

Section Three

Long Island Colonial Waterbird and Piping Plover Survey



Adult Piping Plover

- *Long Island Colonial Waterbird and Plover Survey
Coordinators*

2018 LONG ISLAND COLONIAL WATERBIRD & PIPING PLOVER SURVEY AND COOPERATORS

Year	Site Name	Town/Borough	Surveyor Affiliation
2018	Jones Beach Island East (Oyster Bay)	BABYLON	Audubon NY
2018	Half Moon Beach	NORTH HEMPSTEAD	Audubon NY
2018	Plum Point	NORTH HEMPSTEAD	Audubon NY
2018	Prospect Point	NORTH HEMPSTEAD	Audubon NY
2018	Beekman Beach	OYSTER BAY	Audubon NY
2018	Centre Island - North side	OYSTER BAY	Audubon NY
2018	Centre Island Beach	OYSTER BAY	Audubon NY
2018	Roosevelt Beach	OYSTER BAY	Audubon NY
2018	Stehli Beach	OYSTER BAY	Audubon NY
2018	Orient Beach State Park	SOUTHOLD	Audubon NY
2018	Fire Island Democrat Point	BABYLON	NYSOPRHP/USFWS-LIFO ¹
2018	Jones Beach Island East (Lot # 9)	BABYLON	NYSOPRHP
2018	Cherry Point	EAST HAMPTON	NYSOPRHP
2018	Goff Point	EAST HAMPTON	NYSOPRHP
2018	Hicks Island	EAST HAMPTON	NYSOPRHP
2018	Napeague Beach (State Parks)	EAST HAMPTON	NYSOPRHP
2018	Oyster Pond (Montauk SP)	EAST HAMPTON	NYSOPRHP
2018	Jones Beach Coast Guard Station	HEMPSTEAD	NYSOPRHP
2018	Jones Beach Island West	HEMPSTEAD	NYSOPRHP
2018	Zacks Bay	HEMPSTEAD	NYSOPRHP
2018	Lloyd Point	HUNTINGTON	NYSOPRHP
2018	Fire Island Lighthouse (Robert Moses State Park)	ISLIP	NYSOPRHP
2018	Heckscher Beaches	ISLIP	NYSOPRHP
2018	Hallocks Pond	RIVERHEAD	NYSOPRHP
2018	Callahans Beach	SMITHTOWN	NYSOPRHP
2018	Sunken Meadow	SMITHTOWN	NYSOPRHP
2018	Captree Island	BABYLON	Town of Babylon
2018	Cedar Island Group	BABYLON	Town of Babylon
2018	Dock Island	BABYLON	Town of Babylon
2018	Elder Island	BABYLON	Town of Babylon
2018	Goose Flat	BABYLON	Town of Babylon
2018	Jones Beach Island East (Babylon)	BABYLON	Town of Babylon
2018	Nazeras Island	BABYLON	Town of Babylon
2018	Oak Beach	BABYLON	Town of Babylon
2018	Thatch Island	BABYLON	Town of Babylon
2018	The Grouts	BABYLON	Town of Babylon
2018	Angel Shores	SOUTHOLD	Group for the East End
2018	Conkling Point	SOUTHOLD	Group for the East End
2018	Corey Creek Mouth	SOUTHOLD	Group for the East End

2018	Cutchogue Harbor (Private)	SOUTHOLD	Group for the East End
2018	Cutchogue Harbor (TNC Preserve)	SOUTHOLD	Group for the East End
2018	Downs Creek	SOUTHOLD	Group for the East End
2018	Goldsmith Inlet (Private)	SOUTHOLD	Group for the East End
2018	Goose Creek Southold Bay	SOUTHOLD	Group for the East End
2018	Gull Pond West	SOUTHOLD	Group for the East End
2018	Hashamomuck Beach	SOUTHOLD	Group for the East End
2018	James Creek	SOUTHOLD	Group for the East End
2018	Jockey Creek Spoil Island	SOUTHOLD	Group for the East End
2018	Kimogener Point	SOUTHOLD	Group for the East End
2018	Little Creek	SOUTHOLD	Group for the East End
2018	Little Hog Neck	SOUTHOLD	Group for the East End
2018	Marratooka Point	SOUTHOLD	Group for the East End
2018	Mattituck Inlet	SOUTHOLD	Group for the East End
2018	Paradise Beach Point	SOUTHOLD	Group for the East End
2018	Pipes Cove	SOUTHOLD	Group for the East End
2018	Port of Egypt	SOUTHOLD	Group for the East End
2018	Richmond Creek	SOUTHOLD	Group for the East End
2018	Yellow Bar Hassock	BROOKLYN	NPS –GNRA ²
2018	Breezy Point (Park Service property)	QUEENS	NPS - GNRA
2018	East High Meadow	QUEENS	NPS - GNRA
2018	Fort Tilden Beach	QUEENS	NPS - GNRA
2018	Jacob Riis Beach	QUEENS	NPS - GNRA
2018	Jo Co Marsh	QUEENS	NPS - GNRA
2018	Little Egg Marsh	QUEENS	NPS - GNRA/NYS Audubon
2018	Silver Hole Marsh	QUEENS	NPS - GNRA
2018	Orchard Beach	BRONX	NYC Parks and Recreation
2018	Arverne by the sea	QUEENS	NYC Parks and Recreation
2018	Far Rockaway	QUEENS	NYC Parks and Recreation
2018	Rockaway Beach	QUEENS	NYC Parks and Recreation
2018	Great Gull Island	SOUTHOLD	Am. Museum Nat. History
2018	Canoe Place Beach (West of Shinnecock Canal)	SOUTHAMPTON	Southampton Town
2018	Fairfield Pond Lane Beach	SOUTHAMPTON	Southampton Town
2018	Fish Cove	SOUTHAMPTON	Southampton Town
2018	Fresh Pond	SOUTHAMPTON	Southampton Town
2018	Genet Creek	SOUTHAMPTON	Southampton Town
2018	Gin Lane Beach	SOUTHAMPTON	Southampton Town
2018	Long Beach Sag Harbor	SOUTHAMPTON	Southampton Town
2018	Meschutt Beach (Private)	SOUTHAMPTON	Southampton Town
2018	Middle Pond Inlet	SOUTHAMPTON	Southampton Town
2018	North Sea Harbor	SOUTHAMPTON	Southampton Town
2018	Old Town Road Beach	SOUTHAMPTON	Southampton Town
2018	Pine Neck	SOUTHAMPTON	Southampton Town

2018	Red Cedar Point	SOUTHAMPTON	Southampton Town
2018	Red Creek Pond	SOUTHAMPTON	Southampton Town
2018	Rose Grove	SOUTHAMPTON	Southampton Town
2018	Sagaponack Pond	SOUTHAMPTON	Southampton Town
2018	Sams Creek	SOUTHAMPTON	Southampton Town
2018	Short Beach Sag Harbor	SOUTHAMPTON	Southampton Town
2018	Southampton Beach (Southampton Village)	SOUTHAMPTON	Southampton Town
2018	Squire Pond	SOUTHAMPTON	Southampton Town
2018	Towd Neck	SOUTHAMPTON	Southampton Town
2018	Watermill Beach	SOUTHAMPTON	Southampton Town
2018	Westhampton Island Hampton Beach	SOUTHAMPTON	Southampton Town
2018	Westhampton Island Tiana Beach (Private)	SOUTHAMPTON	Southampton Town
2018	Wooley Pond	SOUTHAMPTON	Southampton Town
2018	Crab Creek	SHELTER ISLAND	Town of Shelter Island
2018	Lower Beach	SHELTER ISLAND	Town of Shelter Island
2018	Reel Point	SHELTER ISLAND	Town of Shelter Island
2018	Shell Beach	SHELTER ISLAND	Town of Shelter Island
2018	Upper Beach	SHELTER ISLAND	Town of Shelter Island
2018	Frost Creek	OYSTER BAY	The Nature Conservancy
2018	Sebonac Creek	SOUTHAMPTON	The Nature Conservancy
2018	Sebonac Neck	SOUTHAMPTON	The Nature Conservancy
2018	Robins Island	SOUTHOLD	The Nature Conservancy
2018	Big Crow Island	HEMPSTEAD	Town of Hempstead
2018	Big Hassock	HEMPSTEAD	Town of Hempstead
2018	Cedar Creek	HEMPSTEAD	Town of Hempstead
2018	Cinder Island Group	HEMPSTEAD	Town of Hempstead
2018	Cuba Island Group	HEMPSTEAD	Town of Hempstead
2018	Deep Creek Meadow	HEMPSTEAD	Town of Hempstead
2018	East Channel Islands	HEMPSTEAD	Town of Hempstead
2018	East Crow Island	HEMPSTEAD	Town of Hempstead
2018	False Channel Marsh	HEMPSTEAD	Town of Hempstead
2018	Garrett Marsh	HEMPSTEAD	Town of Hempstead
2018	Goose Island	HEMPSTEAD	Town of Hempstead
2018	Green Sedge Cedar Island Group	HEMPSTEAD	Town of Hempstead
2018	Hewlett Hassock	HEMPSTEAD	Town of Hempstead
2018	Jones Island	HEMPSTEAD	Town of Hempstead
2018	Lawrence Marsh	HEMPSTEAD	Town of Hempstead
2018	Line Island Group	HEMPSTEAD	Town of Hempstead
2018	Long Beach Island Lido Beach	HEMPSTEAD	Town of Hempstead
2018	Long Beach Island Long Beach	HEMPSTEAD	Town of Hempstead
2018	Long Beach Island Point Lookout	HEMPSTEAD	Town of Hempstead
2018	Long Meadow Island	HEMPSTEAD	Town of Hempstead
2018	Neds Island	HEMPSTEAD	Town of Hempstead

2018	Neds Meadow	HEMPSTEAD	Town of Hempstead
2018	Olivers Island	HEMPSTEAD	Town of Hempstead
2018	Parsonage Island Group	HEMPSTEAD	Town of Hempstead
2018	Westhampton Island West (Village of Westhampton Dunes)	SOUTHAMPTON	Cashin Associates
2018	Westhampton Island Westhampton Beach (ACOE)	SOUTHAMPTON	Cashin Associates
2018	Carters Island	BROOKHAVEN	NYSDEC ³
2018	Cedar Beach - Mount Sinai	BROOKHAVEN	NYSDEC
2018	East Inlet Island	BROOKHAVEN	NYSDEC
2018	Flax Pond Beach	BROOKHAVEN	NYSDEC
2018	New Made Island	BROOKHAVEN	NYSDEC
2018	Pattersquash Island	BROOKHAVEN	NYSDEC
2018	Tuthill Cove Island	BROOKHAVEN	NYSDEC
2018	Wading River Beach	BROOKHAVEN	NYSDEC
2018	West Inlet Island	BROOKHAVEN	NYSDEC
2018	West Meadow Beach	BROOKHAVEN	NYSDEC
2018	Whites Beach	BROOKHAVEN	NYSDEC
2018	Barcelona Neck	EAST HAMPTON	NYSDEC
2018	Asharoken Beach (LIPA)	HUNTINGTON	NYSDEC
2018	Asharoken Beach (Private)	HUNTINGTON	NYSDEC
2018	Eatons Neck Point	HUNTINGTON	NYSDEC
2018	Quintuck Creek	ISLIP	NYSDEC
2018	Fresh Pond Landing	RIVERHEAD	NYSDEC
2018	Jamesport Town Beach	RIVERHEAD	NYSDEC
2018	Miamogue Point	RIVERHEAD	NYSDEC
2018	Reeves Park	RIVERHEAD	NYSDEC
2018	Simmons Point	RIVERHEAD	NYSDEC
2018	Long Beach Peninsula	SMITHTOWN	NYSDEC
2018	Short Beach	SMITHTOWN	NYSDEC
2018	Youngs Island	SMITHTOWN	NYSDEC
2018	Greater Greenbacks Island	SOUTHAMPTON	NYSDEC
2018	Iron Point	SOUTHAMPTON	NYSDEC
2018	Lanes Island	SOUTHAMPTON	NYSDEC
2018	Lesser Greenbacks Island	SOUTHAMPTON	NYSDEC
2018	Sedge Island	SOUTHAMPTON	NYSDEC
2018	Sedge Island Spoil Island	SOUTHAMPTON	NYSDEC
2018	Swan Island	SOUTHAMPTON	NYSDEC
2018	Warner Islands East Island	SOUTHAMPTON	NYSDEC
2018	Warner Islands South Island	SOUTHAMPTON	NYSDEC
2018	Warner Islands West Island	SOUTHAMPTON	NYSDEC
2018	Westhampton Island Tiana Marsh	SOUTHAMPTON	NYSDEC
2018	Westhampton Island Westhampton Beach (DEC)	SOUTHAMPTON	NYSDEC
2018	Accabonac Harbor	EAST HAMPTON	Town of East Hampton
2018	Atlantic Double Dunes (Town)	EAST HAMPTON	Town of East Hampton

2018	East Hampton Beach	EAST HAMPTON	Town of East Hampton
2018	Gardiners Island Cartwright Point	EAST HAMPTON	Town of East Hampton
2018	Georgica Pond	EAST HAMPTON	Town of East Hampton
2018	Lazy Point	EAST HAMPTON	Town of East Hampton
2018	Lionhead Beach	EAST HAMPTON	Town of East Hampton
2018	Montauk Beach	EAST HAMPTON	Town of East Hampton
2018	Napeague Beach (Town)	EAST HAMPTON	Town of East Hampton
2018	Sammys Beach Peninsula	EAST HAMPTON	Town of East Hampton
2018	Wainscott Pond	EAST HAMPTON	Town of East Hampton
2018	Fire Island Pines	BROOKHAVEN	NPS-FINS ⁴
2018	Fire Island Sunken Forest	BROOKHAVEN	NPS-FINS
2018	Fire Island Wilderness	BROOKHAVEN	NPS-FINS
2018	Fire Island Wilderness Long Cove	BROOKHAVEN	NPS-FINS
2018	Fire Island Wilderness Watch Hill	BROOKHAVEN	NPS-FINS
2018	Hospital Island	BROOKHAVEN	NPS-FINS
2018	John Boyle Island	BROOKHAVEN	NPS-FINS
2018	Pelican Island	BROOKHAVEN	NPS-FINS
2018	Ridge Island	BROOKHAVEN	NPS-FINS
2018	East Fire Island	ISLIP	NPS-FINS
2018	Fire Island Lighthouse (FINS)	ISLIP	NPS-FINS
2018	Fire Island Villages	ISLIP	NPS-FINS
2018	Sexton Island	ISLIP	NPS-FINS
2018	West Fire Island	ISLIP	NPS-FINS
2018	Lloyd Neck East Beach	HUNTINGTON	Krusos Foundation
2018	Gibson Beach	SHELTER ISLAND	The Nature Conservancy
2018	Mashomack Point	SHELTER ISLAND	The Nature Conservancy
2018	Atlantic Double Dunes (NWR)	EAST HAMPTON	USFWS-Refuges
2018	Gardiners Point Island	EAST HAMPTON	USFWS-Refuges
2018	Champlin Creek Mouth	ISLIP	USFWS-Refuges
2018	Jessup Neck (USFWS property)	SOUTHAMPTON	USFWS-Refuges
2018	Fire Island East aka Smith Point	BROOKHAVEN	Suffolk County Parks
2018	Mount Misery Point	BROOKHAVEN	Suffolk County Parks
2018	Old Field Beach (Suffolk County Parks)	BROOKHAVEN	Suffolk County Parks
2018	Old Field Beach (Village Property)	BROOKHAVEN	Suffolk County Parks
2018	Roe Avenue Patchogue	BROOKHAVEN	Suffolk County Parks
2018	Smith Point Shirley	BROOKHAVEN	Suffolk County Parks
2018	Terrell River	BROOKHAVEN	Suffolk County Parks
2018	Alewife Brook	EAST HAMPTON	Suffolk County Parks
2018	Cedar Point	EAST HAMPTON	Suffolk County Parks
2018	Northwest Creek Mouth	EAST HAMPTON	Suffolk County Parks
2018	Oyster Pond (County Park)	EAST HAMPTON	Suffolk County Parks
2018	Shagwong Point	EAST HAMPTON	Suffolk County Parks
2018	Timber Point	ISLIP	Suffolk County Parks

2018	Birch Creek	SOUTHAMPTON	Suffolk County Parks
2018	Cow Yard Beach	SOUTHAMPTON	Suffolk County Parks
2018	Goose Creek Flanders Bay	SOUTHAMPTON	Suffolk County Parks
2018	Jessup Neck (Clam Island)	SOUTHAMPTON	Suffolk County Parks
2018	Meschutt Beach (County Park)	SOUTHAMPTON	Suffolk County Parks
2018	Mill Creek	SOUTHAMPTON	Suffolk County Parks
2018	Southampton Beach (Shinnecock East County Park)	SOUTHAMPTON	Suffolk County Parks
2018	Westhampton Island Tiana Beach (County Park)	SOUTHAMPTON	Suffolk County Parks
2018	Westhampton Island West (Cupsogue County Park)	SOUTHAMPTON	Suffolk County Parks
2018	Cedar Beach Point	SOUTHOLD	Suffolk County Parks
2018	Goldsmith Inlet (County Parks)	SOUTHOLD	Suffolk County Parks
2018	Long Beach Island Atlantic Beach	HEMPSTEAD	USFWS - LIFO
2018	Centre Island Tidal Creek	OYSTER BAY	USFWS - LIFO
2018	Plum Island	SOUTHOLD	USFWS - LIFO
2018	Crab Meadow Beach	HUNTINGTON	USFWS - LIFO
2018	Sand City	HUNTINGTON	USFWS - LIFO
2018	Tobay Marsh Islands	OYSTER BAY	USFWS - LIFO
2018	Breezy Point (Cooperative Area)	QUEENS	USFWS - LIFO
2018	Canarsie Pol	BROOKLYN	NYC Audubon
2018	Governors Island	NEW YORK	NYC Audubon
2018	Gardiners Island	EAST HAMPTON	EAST HAMPTON
2018	Fishers Island Airfield Beach	SOUTHOLD	USFWS-LIFO
2018	Fishers Island Beach Pond	SOUTHOLD	USFWS-LIFO
2018	Fishers Island Mud Pond Beach	SOUTHOLD	USFWS-LIFO

- 1- New York State Office of Parks, Recreation and Historic Preservation/U.S. Fish and Wildlife Service-Long Island Field Office
- 2- National Park Service-Gateway National Recreation Area
- 3- New York State Department of Environmental Conservation
- 4- National Park Service-Fire Island National Seashore

Section Four

Emergency Procedures



Adult Piping Plover

- *Explanation of Take*
- *Using Photographs Effectively*
- *Emergency Contact List*
- *Incident Observation Report*

TAKE

STANDARD OPERATING PROCEDURES FOR REPORTING A POSSIBLE LOSS BY TAKE

“Take” is defined as “to harass, harm, pursue, hunt, shoot, wounding, kill, capture, or collect, or to attempt to engage in any such conduct” (from the Federal Endangered Species Act). Any observed or apparent take must be reported for Federal- and New York State-protected threatened or endangered species. This section describes what a steward should do in the event of take, to whom he/she should report, and what exactly should be reported. The information provided is the general standard operating procedure.

The stewards should do two things in the event of a take: 1) contact, in the order that they appear the personnel identified in the “Who to Contact in an Emergency” Standard Operating Procedure; and 2) document and secure the scene. If two stewards are at the scene, one person should notify the appropriate agencies and the other should document the incident and secure the scene. If there is only one steward, the steward should spend 10-15 minutes documenting the evidence, try to recruit beach-goers to act as witnesses and help secure the scene, notify appropriate agency personnel, and return to the scene to continue evidence documentation and guarding the scene.

Documenting the scene involves completing the “Piping Plover Incident Observation Report”. This information is needed by law enforcement officers and biologists to better understand what happened at the scene. It is very important to notify the appropriate agencies (see list on next page) and document the scene. However, the steward is not a law enforcement official. At no time should a steward endanger themselves by confronting a possible perpetrator if it is unsafe.

In general, it is best to keep the scene as undisturbed as possible in order for the law enforcement officials to investigate. Therefore, leave everything untouched unless otherwise instructed by USFWS or NYSDEC. Stewards and land managers should develop a protocol for dealing with after-hours or weekend incidents.

What are you looking for?

- ! A dead piping plover, broken eggs, or missing nests;
- ! Off-road vehicles in the fenced area or evidence thereof;
- ! Someone deliberately harassing the plovers or vandalizing the fences, signs, or enclosures;
- ! A pedestrian within the fenced area or evidence thereof;
- ! Someone removing fencing that is not with a plover monitoring program;
- ! Dogs off the leash around or in the fenced area; or
- ! Any other suspicious activity or signs of such activity

Using Photographs Effectively

Photographs are important to record unusual events on the beach and how they affect plovers. A good photograph can provide crucial information on these events. However, certain lighting and substrate situations can make a good photograph difficult.

A situation commonly encountered on the beach is backlighting. This occurs when the sun or the strong glare from the ocean is behind the object to be photographed. The best solution for this problem is to situate yourself so that the sun is behind or beside you as you take the picture. If you are unable to situate yourself in this way, you should use the flash of the camera to offset the sun. The flash should also be used in low light situations. It is often best to take a few pictures of the scene, some with the flash and some without.

Pictures of objects or carcasses on the ground should be accompanied by a ruler so that the object can be measured. In addition, make sure that the object photographed fits entirely within the frame and that the feature you want to show is visible. For example, if there is a shoe imprint next to an eggshell, utilize the ambient light so that the shadows accentuate the pattern of the sole. In addition, remember to take pictures from several angles: a picture may reveal something overlooked at the site.

Whereas the foregoing tips on photography might appear obvious, it is important to think about what you want the photograph to show so that it will appear clearly on the photograph.

WHO TO CONTACT IN AN EMERGENCY

STANDARD OPERATING PROCEDURE

If you see something that threatens the piping plover, fill out the Piping Plover Incident Observation Report@, take photographs and contact the following agencies. If you cannot get in touch with someone on the list, continue down the list then return to those you could not reach:

1. **USFWS Law Enforcement** (516) 825-3950
Carolyn Rushforth (516) 825-3950 ext 55233
2. **NY State Dept. of Environmental Conservation, Conservation Officers**
(8:00 a.m. - 4:30 p.m., Monday - Friday)
Region I Dispatch (Nassau & Suffolk): (631) 444-0250
Region I (After hours) 1 (800) 444-1621
Region II Dispatch (5 Boroughs of NYC): (718) 482-4885
3. **USFWS Ecological Services, Long Island Field Office** (631) 286-0485
Steve Papa or Steve Sinkevich
4. **NY State Dept. of Environmental Conservation, Bureau of Wildlife**
Region I – Michelle Gibbons/Kevin Jennings (631) 444-0312, 0307
Field cell phone (516) 578-8899
Region II – Ken Scarlatelli (718) 482- 4020
5. **Local Authority** (county park police, park manager, bay constable, etc.)

What should you report?

- ! Exact location of incident;
- ! Time of incident;
- ! Description of person, vehicle, etc.;
- ! Description of action;
- ! How you can be contacted;
- ! Who you have contacted at this point; and
- ! Anything else the Law Enforcement staff asks for.

REMEMBER: YOU ARE NOT A LAW ENFORCEMENT OFFICIAL! If you see something happen, do not place yourself in a dangerous position. Contact the local, State, and Federal agencies. DO NOT DISTURB THE SCENE. Tracks in the sand, wrack-line position, and existing fencing measures may be important to the investigation. DO NOT REMOVE CARCASS OR EGG(S). Authorization for this is given only by the U.S. Fish and Wildlife Service or the NYSDEC.

Incident Observation Report

DO NOT DISTURB THE SITE. DO NOT TOUCH OR REMOVE THE BIRD OR EGG UNLESS OTHERWISE AUTHORIZED TO DO SO BY U.S. FISH AND WILDLIFE LAW ENFORCEMENT STAFF.

Observer's Name: _____ Date: _____
Affiliation: _____ Time: _____
Site Name: _____ Town: _____
Time of Incident (if known): _____

Witness? (Name) _____ Witness? (Name) _____
Tel. Number (include area code): _____ Tel. Number (include area code): _____

Bird / Nest Conditions

	# of Eggs	# of Chicks	# of Adults
Plovers Observed Today			
# and Date Last Sighted	/	/	/

Nest Condition: Undisturbed _____ Disturbed (describe) _____
Condition of Eggs/Bird: Shell Broken _____ Bird: Plump _____ Flat _____ Missing Parts? _____
Tracks present: Tire _____ Animal (type) _____ Footprints _____
Number & location relative to bird or egg(s): _____
Incident Setting (where and how found): _____

Site / Environmental Conditions

Current Weather Conditions:
Date of Last Rainfall (if known): _____
Tide: High _____ Low _____ Rising _____ Falling _____
Condition of Sand: Loose _____ Packed _____ Wet _____ Dry _____ Other (describe) _____
Symbolic Fencing: _____ Predator Enclosures: _____ Damage (describe): _____
Efforts to secure the scene:

Photos taken: Y N Notification: USFWS/LE _____ Town _____ Trustees _____
Local LE _____ NYSDEC/LE _____ TNC _____ Landowner _____ Other _____

Threats / Disturbances

Unleashed Pets _____ ORVs _____ Crows _____ Gulls _____ Fox _____ Other _____

Other Comments: _____

PLEASE DRAW A SITE DIAGRAM (on the reverse). **Include:** legend, take location (distance to permanent landmark), nest location, fencing and predator enclosure (if present), tire ruts, roads, & other significant landmarks, water bodies, all wrack lines, AHWL, etc.

DIAGRAM

LEGEND

Section Five

Biology and Behavior of State- and Federally-Listed Species



Adult Piping Plover

- *Distinguishing Piping Plovers from Other Shorebirds – Marcelo del Puerto*
- *New York State Department of Environmental Conservation Bulletins*
 - *Piping Plover*
 - *Least Tern*
 - *Roseate Tern*
 - *Common Tern*
- *Seabeach Amaranth Identification Guide*
- *The Nature Conservancy Seabeach Knotweed Identification Guide and Survey Report*

Distinguishing Piping Plovers from Similar Shorebirds

Marcelo J. del Puerto – NYSDEC

As a steward on the beach, you will encounter many different species of birds. You should carefully review a copy of the *Peterson Field Guide to Eastern Birds* or another good field guide in order to reliably distinguish between the various species of gulls, terns, and other shorebirds that routinely interact with piping plovers on the beach.

This section will help you distinguish piping plovers from three other species readily encountered on outer Long Island beaches. These species are: the sanderling, *Calidris alba*; the killdeer, *Charadrius vociferous*; and the semipalmated plover, *Charadrius semipalmatus*. Criteria which should be used for an accurate identification include: plumage, field marks, silhouette, behavior, and voice.

Piping plovers:

Plumage: Piping plovers have a pale tan back, a stripe across the forehead, a ringed neck, and a white belly.

Field Marks: Field marks are prominent features of a bird's plumage, bill, or extremities that often allow a quick and reliable identification. Some field marks, however, can only be seen during specific times of the year. For the piping plover in breeding plumage, the field marks are: a stripe across the forehead (usually but not always present), a complete or partial dark single ring around the neck, an orange or yellow-tipped black bill, orange or red legs, and the characteristic pale back. In flight, white wing strips, a whitish rump patch, and a black spot at the tip of the rounded tail can be seen.

Silhouette: When the sun appears behind the bird being observed or the light is insufficient to discern coloration, plumage or field marks may not be sufficiently clear for reliable identification. In addition, the strong glare of the ocean often compounds the problem. In these cases, the silhouette and posture of the bird become an especially important aid to identification. Piping plovers appear 6.5-7.5 inches long and have a wingspread of 15 inches. Piping plovers appear plumper than other similar-sized shorebirds and may often be seen crouching.

Behavior: Typical behaviors and displays of breeding piping plovers are covered elsewhere on this training guide. Piping plovers are often seen foraging at the wrack line or at the water's edge or crouching when they perceive a threat. They may also be seen performing their characteristic circular flight.

Voice: A plaintive and bell-like two-part whistle. Often described as *peep-lo*; the first part being higher-pitched than the second. This call may be given from land or while in flight.

The sanderling: Sanderlings are often found in scattered groups chasing retreating waves and foraging on stranded organisms. Piping plover stewards are often asked by the public: "Why are you protecting these birds (piping plovers) when there are so many of them? I saw a ton of them down by the water." This beachgoer is most probably confusing sanderlings with piping plovers. Although the two species bear a similarity, an alert observer can readily tell them apart.

Plumage: Summer plumage for the sanderling is bright rusty or light brown around the head, back, and breast, and whitish around the belly.

Field Marks: For the summer plumage of the sanderling, the rusty back is the most reliable field marks. In addition, sanderlings in flight reveal a white stripe on the wing running down to the wrist.

Silhouette: Sanderlings are approximately 7-8" long. Whereas plovers appear plump and often stand erect, sanderlings appear thinner and their legs appear spread apart as they run along the shoreline.

Behavior: As noted previously, foraging sanderlings are often seen charging retreating waves.

Additionally, sanderlings often take short flights which appear almost like hops.

Voice: A distinctive, short, and rapid *twick* or *quit*.

The killdeer: Killdeer are noisy plovers often seen flying or running short distances on the grassy fields where they forage. On Long Island, they may also be seen on the beach-side parking lot or on the beach itself. An attentive steward should not have any difficulty distinguishing this species from piping plovers.
Plumage: The summer plumage of the killdeer is distinctive, consisting of a light or gray brown back and head, and a white belly.

Field Marks: The killdeer is the only plover with two black breast bands. In addition, there is a black band on the forehead and a white stripe behind the eye. The bill is entirely black. In flight, a golden or yellow rump is evident.

Silhouette: Killdeer are about twice the size of piping plover, 9-11" long. They have long, yellow-gray legs and often stand erect. In addition, the head appears slightly square in comparison to the piping plover's rounded head.

Behavior: The most-often seen behaviors of this bird are short running spurts and low flights.

Voice: The loud and repetitious *ki-deea, ki-deea* of this species gives it its name. Sometimes this call may be abridged to *dee-dee-dee*.

The semipalmated plover: Although they breed in or near the Arctic, migrant semipalmated plovers are often seen on our beaches, especially towards the fall as they prepare for their southwardly migration. Distinguishing these birds from piping plovers is probably the biggest identification challenge you will encounter as a steward. Seasoned birders are often thrown off by these birds as well, especially when they are observed at a distance or at low light. However, by focusing on the identification criteria, you will be able to reliably distinguish between these two closely related species.

Plumage: Semipalmated plovers have a brown back and head, often described as the color of wet sand, and a white belly. In the wintertime, the back and head appear gray-brown to gray. In the fall, they can show a transition between these two colors.

Field Marks: The brown back and head are distinctive. In addition, semipalmated plovers have a single dark breast band, much like that of the piping plover, but thicker and more pronounced. This dark breast band is partially or entirely lacking in the fall and winter semipalmated plovers.

Silhouette: Semipalmated plovers are 6.5-7.5" in length and may appear slightly plumper than piping plovers. In general, however, silhouettes of piping and semipalmated plovers are so similar as to be unreliable for identification.

Behavior: As previously noted, semipalmated plovers on our beaches appear only as migrants, not as nesters. Therefore, their most common activity is feeding and loafing by the waterline. Hence, if you see a displaying plover near a group of semipalmated plovers, check again! It is most likely a piping plover.

Voice: Semipalmated plovers produce an upward, slurred *chi-wee* or *too-li*. However, they may mostly be quiet on the beaches.

Bibliography

Peterson, R.T. 1980. Peterson Field Guides: Eastern Birds. Houghton Mifflin Company, Boston. 384pp.

Kaufman, K. 1990. Peterson Field Guides: Advanced Birding. Houghton Mifflin Company, Boston. 299pp

Illustrations and text from Roger T. Peterson's "Peterson Field Guide to Eastern Birds"



Piping Plover Fact Sheet

More information from this division:

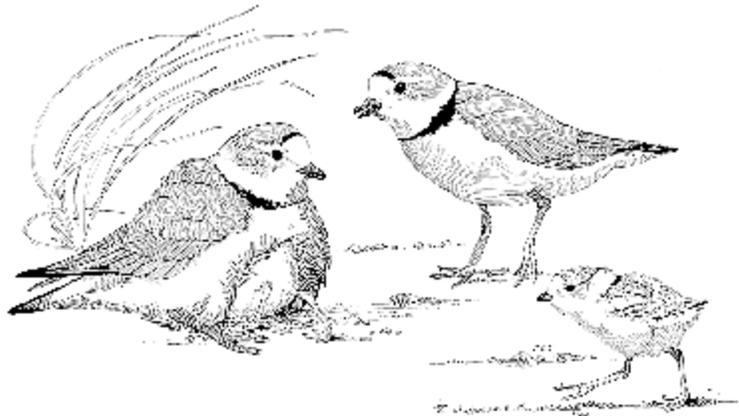
[Fish, Wildlife and Marine Resources](#)
[Endangered Species Program](#)

Piping Plover *Charadrius melodus*

New York Status: **Endangered**
Federal Status: **Threatened**

Description

This pale shorebird with orange legs is the color of dry beach sand. It weighs 1.5 to 2.25 ounces (43-64 gm) and is 5.5 inches (14 cm) long. In spring and summer, it sports a single black neck band and a narrow black band across its forehead. In flight, the rump is white. The bill is yellowish with a black tip. The sexes appear similar in both size and plumage. The call is a melodious, organ-like, two to four note whistle. Piping plovers are seen singly or in small flocks.

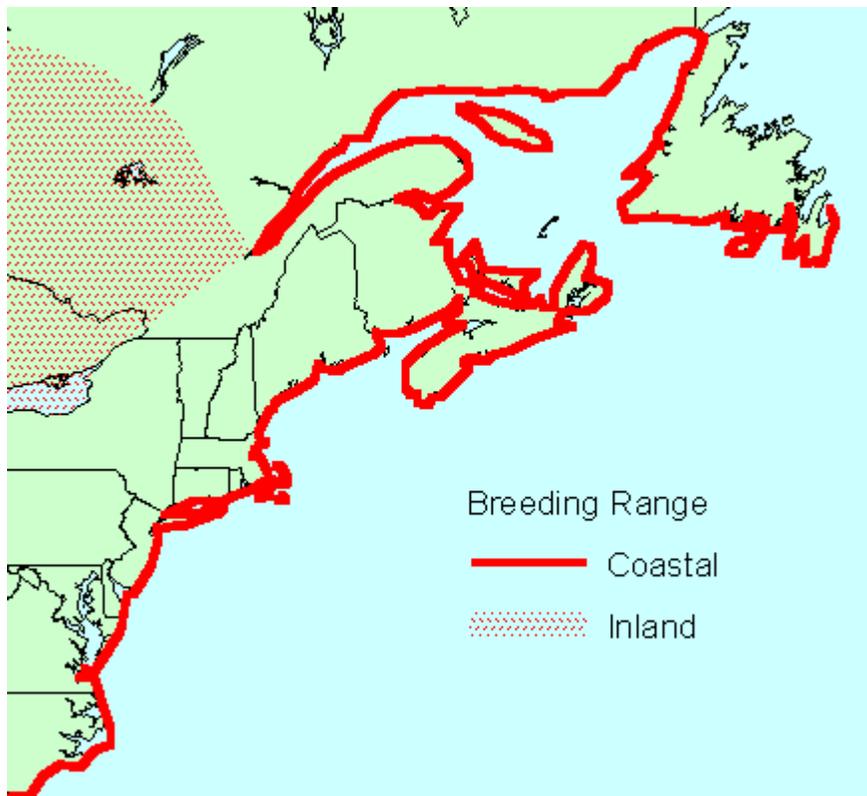


Life History

The piping plover is the first of the shorebirds to arrive on the breeding grounds, starting from early to mid-March. Nests, which are shallow scrapes, are made during courtship and are sometimes lined with pebbles and/or shells. They are usually placed well above the high tide mark on open, generally grassless sand beaches or dredged spoil areas. During May and June, 1 egg is laid every other day until the average clutch of 4 eggs is complete. If the first nesting attempt is unsuccessful, a second or third clutch may be laid, often containing only 3 eggs. The piping plover often nests with a colony of least terns. Incubation by both sexes begins with the laying of the fourth egg and takes 25-31 days. The young are precocial and leave the nest shortly after hatching and fledge in about 28-35 days. By early September, all but a few stragglers have departed for their wintering areas.

Diet consists principally of marine worms, insect larvae, beetles, crustaceans, mollusks and other small marine animals and their eggs. Food is obtained by foraging on beaches, dunes and in tidal wrack. Data on the breeding behavior of piping plovers shows that some adults return to the same nesting area annually and may retain the same mate as well. One recaptured individual on Long Island was 14 years of age.

Distribution and Habitat



Piping plovers breed on dry sandy beaches or in areas that have been filled with dredged sand, often near dunes in areas with little or no beach grass. They occur along the Atlantic Coast from southwestern Newfoundland and southeastern Quebec south to North Carolina, and on inland beaches from eastern Alberta and Nebraska to Lake Ontario. Three populations currently exist: one along the east coast, another on the upper Great Lakes,

and a third on the major river systems and wetlands of the northern Great Plains.

Within New York, this species breeds. on Long Island's sandy beaches, from Queens to the Hamptons, in the eastern bays and in the harbors of northern Suffolk County. A single pair was also recorded in 1984 at Sandy Pond, Lake Ontario in Oswego County.

Piping plovers spend winters along the coast from Texas to North Carolina, and infrequently as far south as the Bahamas and Greater Antilles.

Status

This species was driven to near extinction around the turn of the century by extensive hunting for meat and sport. Protection since 1918 by the Migratory Bird Treaty Act allowed piping plovers to make a recovery by the mid-1920's. The population peaked in the 1940's, but declined once again due to development and recreation following World War II. Continued human pressures such as coastal development, recreational activities, and disturbance by off-road vehicles have reduced the available suitable breeding habitat for these birds. No population increases were recorded from the 1970's to the 1980's. However, recent surveys have estimated the Atlantic Coast population slightly higher at approximately 800 breeding pairs, about 200 of which nest in New York.

The piping plover is also listed as endangered in Maine, New Hampshire, New Jersey, Maryland, Indiana, Michigan, Minnesota, Wisconsin, Iowa, Ohio and Pennsylvania. It is threatened in the remainder of its range.

Management and Research Needs.

Survey groups from the New York State Department of Environmental Conservation, the Nature Conservancy, the Audubon Society and a network of concerned volunteers annually census the breeding colonies on Long Island. With the cooperation of private and public landowners, fencing and signs prohibiting entry have been erected to protect existing colonies from disturbance. Tern/plover stewards actively patrol and monitor nesting sites to increase nesting success and alert the public to the vulnerability of these species to human disturbance.

Additional References

Ehrlich, P. R., D. S. Dobkin and D. Wheye. 1988. *The Birder's Handbook*. Simon and Schuster Inc., New York. p.112.

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Peterson, D. M. 1988. Piping plover, *Charadrius melodus*. Pages 148-149 in R. F. Andrie and J. R. Carroll, Eds.. *The Atlas of Breeding Birds in New York*. Cornell Univ. Press, Ithaca, NY.

Terres, J. R. 1980. *The Audubon Encyclopedia of North American Birds*. Alfred A. Knopf, New York. p.744.

Drawing by Julie Zickefoose (1986)

For additional information contact:

Endangered Species Unit
NYSDEC
625 Broadway
Albany, NY 12233-4754



Least Tern Fact Sheet

More information from this division:

[Fish, Wildlife and Marine Resources](#)
[Endangered Species Program](#)

Least Tern *Sterna antillarum*

New York Status: **Threatened**

Federal Status: **Endangered** (interior U. S. only, not on coast)

Description

The least tern is the smallest American tern, weighing about 1 ounce (28 gm) and measuring about 9 inches (23 cm) in length. It is identified in spring and summer by a white forehead contrasting with a black crown and nape. Its body is slate grey above and white below, with the pointed wings and forked tail characteristic of most terns. The bill and feet are yellow. Wing beats are uniquely rapid and the black leading edge of the outer wing is conspicuous in flight. Immature least terns have upper parts which are mottled white and dark brown.

The call is either a sharp, penetrating "kip-kip-kip" or a shrill "zreep."



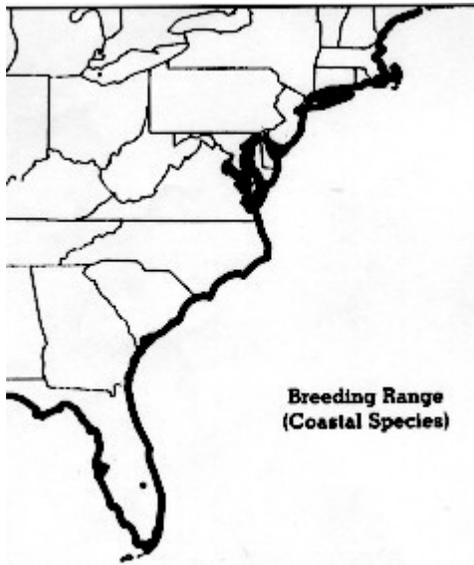
Life History

By late April to mid-May, the least tern is on its northernmost breeding grounds, usually arriving before common terns and black skimmers. The least tern breeds in colonies of up to 200 birds. Nests are scraped in sand, shell or gravel, and may be sparingly lined with small shells or other debris. Eggs are commonly laid in clutches of 2 from late May through June, and are incubated by both sexes for 21 days. The young fledge in 19-20 days. The least tern is very defensive in the colony, and adults scream and dive at intruders. Piping plovers, another endangered beach-

nesting bird, are commonly found nesting in association with least terns. By late August and early September, least terns leave their northern breeding grounds to head for wintering areas.

Least terns feed mostly on small fish caught by skimming the surface of the water or by making dives from the air. Banding studies have shown individuals living up to 21 years.

Distribution and Habitat



The least tern has a nearly worldwide distribution. In the Western Hemisphere, it breeds on the Pacific Coast from central California to Peru, inland along the Colorado, Red, Rio Grande, Missouri and Mississippi river systems, on the Atlantic Coast from Maine to Argentina, and along the Great Lakes in Michigan, Minnesota, Wisconsin and Ohio. Migrants mainly occur on Long Island's outer coast and rarely on the lower Hudson River. This species winters from the Gulf Coast and Central America south to Peru and Brazil.

The least tern breeds on broad, level expanses of open sandy or gravelly beach, dredge spoil and other open shoreline areas, and more rarely, inland on broad river valley sandbars. In an unusual case, 20 pairs nested on the roof of a city auditorium in Pensacola, Florida in 1957, and have continued to do so annually.

Status

The U. S. Fish and Wildlife Service lists the least tern population found in the interior U. S. as endangered. Around the turn of the century, the least tern was in danger of extirpation in the northeastern U. S. because of hunting for the millinery trade. Protective legislation in 1918 allowed the species to recover in the 1920's and 1930's. In recent years, however, human pressures have been causing a decline in populations of this species. Surveys from 1985-1995 found an average of approximately 3,000 breeding pairs at between 50 and 66 colonies along New York's Long Island coast. Development of coastal areas destroys breeding habitat and recreational activities can disrupt reproduction. Increases in populations of more aggressive gulls have led to competition for nesting sites. Some colonies are severely limited by predation from rats, great horned owls, black-crowned night herons, dogs and cats.

Management and Research Needs

Researchers from private and public conservation organizations, as well as concerned volunteers annually census breeding colonies on Long Island. With the

cooperation of landowners, nesting areas are fenced off and signs are posted in an attempt to protect colonies from disturbance. Tern stewards monitor colonies and provide information to the public about this and other beach-nesting species. Extermination of rats has been undertaken in several areas.

Additional References

Ehrlich, P. R., D. S. Dobkin and D. Wheye. 1988. *The Birder's Handbook*. Simon and Schuster, Inc., New York. p.186.

Farrand, J., Jr. 1983. *The Audubon Society Master Guide to Birding*. Vol. 2: Gulls to Dippers. Alfred A. Knopf, New York. pp. 96-98.

Peterson, D. M. 1988. Least tern, *Sterna antillarum*. Pages 182-183 in R. F. Andrie and J. R. Carroll, Eds. *The Atlas of Breeding Birds in New York State*. Cornell Univ. Press, Ithaca, NY. 551 pp.

Terres, J. R. 1980. *The Audubon Society Encyclopedia of North American Birds*. Alfred A. Knopf, New York. pp. 469-470.

Drawing by Karen Allaben-Confer

For additional information contact:

Endangered Species Unit
NYSDEC
625 Broadway
Albany, NY 12233-4754



Roseate Tern Fact Sheet

More information from this division:

[Fish, Wildlife and Marine Resources](#)
[Endangered Species Program](#)

Roseate Tern *Sterna dougallii*

New York Status: **Endangered**

Federal Status: **Endangered**

Description

The roseate tern is a graceful bird, 14 to 17 inches (36-43 cm) long, with a wingspan of about 30 inches (76 cm). It resembles the common tern. Its back and upper wings are a light pearly-grey, while its underparts are white. The tip of the white tail extends well beyond its wing tips when the bird is at rest. In the summer it has a black cap, nape and bill.

Juveniles have prominent dark "V" s on the feathers of the back. The flight of this bird is distinctive, with rapid, shallow wingbeats of equal emphasis on the upstroke and downstroke. Its call is a rasping "z-aa-p" or a soft, two-syllabled "chivy." Roseate terns feed primarily on American sand lance, a small marine fish.



Life History

Roseate terns arrive on the breeding grounds in late April or early May and begin nesting one month later. In New York, roseate terns are always found nesting with common terns. The nest may be only a depression in sand, shell or gravel, and may be lined with bits of grass and other debris. It is usually placed in dense grass clumps, or even under boulders or rip-rap. Both adults incubate the eggs for about 23 days, and the young fledge in 22- 29 days. One brood per season is typical, although two broods are sometimes produced. Migration begins in late summer. One banded individual from Great Gull Island, New York was 9 years old when recovered.

Distribution and Habitat



A marine coastal species, the roseate tern breeds along the coasts of the Atlantic, Pacific and Indian oceans on salt marsh islands and beaches with sparse vegetation. In eastern North America, it breeds from the Canadian Maritime Provinces south to Long Island, although formerly the breeding range extended to Virginia.

In New York, this species breeds only at a few Long Island colonies. The largest colony, more than 1,000 pairs, is located at Great Gull Island off eastern Long Island.

Status

During the 1870's and 1880's, the roseate tern was in serious danger of extirpation from its range in the northeastern U. S. due to hunting for the millinery trade. Protection since 1918 under the Migratory Bird Treaty Act allowed this tern to recover in the 1920's and 1930's.

Threats to roseate tern populations include vegetational changes on the breeding areas, competition with gulls for suitable nesting areas, and predation. The increased presence of humans has contributed to higher predation rates. Predators such as raccoons find tern nests when they are attracted to the garbage left behind by careless beach users.

The roseate tern population is estimated to have fallen by 75% since the 1930's. Recent survey data indicates that 87% of the birds in New York nest in only one colony at Great Gull Island.

Management and Research Needs.

Status and distribution of roseate tern populations is monitored annually by the New York State Department of Environmental Conservation in cooperation with the

American Museum of Natural History, The Nature Conservancy and other researchers. A critical research need is to better understand the species' wintering habits and survival. One of the highest priorities in the Recovery Plan prepared by the U. S. Fish and Wildlife Service is to extend the species range by restoring some of the historic breeding areas. A recent success in New York was the nesting of roseate terns and 60 pairs of common terns on Gardiners Point Island in 1995. This site supported no terns when habitat management began in 1990.

Additional References

Ehrlich, P. R., D. S. Dobkin and D. Wheye. 1988. *The Birders' Handbook*. Simon and Schuster, Inc., New York.

Farrand, J., Jr. 1983. *The Audubon Society Master Guide to Birding*. Vol. 2: Gulls to Dippers. Alfred A. Knopf, New York. pp. 90-92.

Nisbet, I. C. T. 1992. *A closer look: Roseate Tern*. *Birding*. October issue.

Peterson, D. M. 1988. *Roseate tern sterna dougallii*. Pages 176-177 in R. F. Andrie and J. R. Carroll, Eds., *The Atlas of Breeding Birds in New York State*. Cornell University, Ithaca, NY.

Terres, J. R. 1980. *The Audubon Society Encyclopedia of North American Birds*. Alfred A. Knopf, New York. p.470.

Drawing by Karen L. Allaben-Confer

For additional information contact:

Endangered Species Unit
NYSDEC
625 Broadway
Albany, NY 12233-4754



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Common Tern Fact Sheet

More information from this division:

[Fish, Wildlife and Marine Resources](#)
[Endangered Species Program](#)

Common Tern *Sterna hirundo*

New York Status: **Threatened**
Federal Status: Not Listed

Description

The common tern is the most widespread and abundant tern in New York. This species has a light grey back, white underparts, a white, deeply forked tail, and a glossy black cap and nape. Its pointed wingtips are noticeably darker than those of the roseate tern with which it associates. The tail is also shorter and has darker outer edges. In breeding plumage, the bill is blood red with a black tip. The immature and winter adult lack enough of the black crown to appear as though balding, and the bill is uniformly dark. The call is a harsh, rolling "kee-urr," with a downward inflection. The average common tern is 13-16 inches (33-40 cm) in length, has a wingspan of about 31 inches (71 cm) and weighs about 4.2 ounces (120 gm).

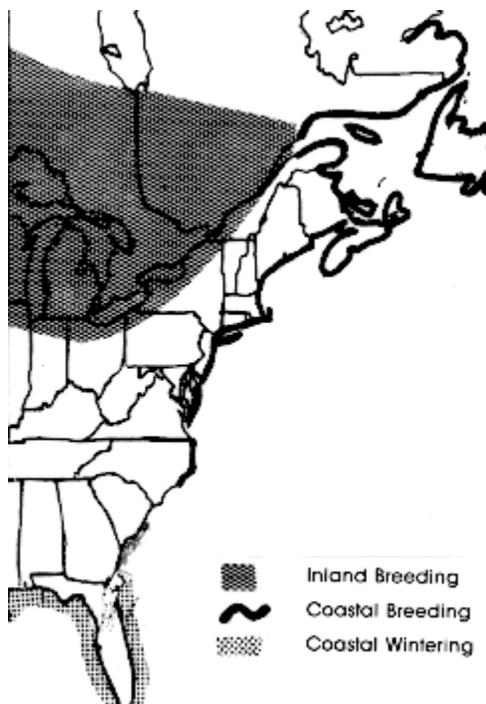


Life History

From late April to mid-May, common terns return to their northern breeding colonies. These colonies may contain several hundred to several thousand birds, including roseate, least and gull-billed terns, and black skimmers on Long Island. The nest is a simple scrape built above the high tide line in sand, gravel, shells or windrowed seaweed. It is usually lined with vegetation. A clutch of 2-4 (usually 3) eggs is laid during late May through July. Both sexes share incubation duties for 21-27 days. The young fledge about 28 days after hatching. One brood per season is typical, but re-nesting is common when the first nest is destroyed. By mid-October, the terns depart for wintering grounds, sometimes flying as fast as 40 mph.

The common tern secures its prey in a fashion similar to other terns, striking the water in shallow dives or skimming the surface. It feeds on small fish up to 3-4 inches in length. Occasionally, shrimp or aquatic insects are taken. One banded individual was found to be 25 years old upon recapture.

Distribution and Habitat



Common terns inhabit sand and shell beaches, grassy uplands and rocky inland shores in North and South America, Eurasia, and northern Africa. This species breeds in North America along the Atlantic Coast from the northern Maritime Provinces of Canada to South Carolina, and occasionally in the Gulf of Mexico or on large inland lakes. Wintering grounds are from its southernmost breeding areas on the Atlantic Coast to northern Ecuador and Brazil. In New York, common terns nest predominantly on Long Island, but they are also known to breed on small natural and artificial islands (power cribs, piers, navigation sites, etc.) in Lake Erie, Lake Ontario, the St. Lawrence and Niagara rivers, and Oneida Lake in central New York.

Status

In the early 1900's, common terns were almost extirpated by plume hunters. Protective legislation in 1918 allowed this species to make a comeback in the 1920's and 1930's. Today, competition with ring-billed gulls for nest sites in upstate New York and disturbance on Long Island breeding beaches are the reasons for decline. Many colonies are being forced to breed in salt marsh habitats as a result of the increased human use of beaches and competition with herring and great black-backed gulls. Flooding and predation are problems as well.

Management and Research Needs

Researchers from private and public conservation organizations and concerned volunteers census tern breeding areas on Long Island annually. Extermination of rats has been undertaken in some areas where they were a problem in the past. In upstate New York, some nesting success has occurred as a result of the construction of gull exclosures on the terns' nesting islands.

Additional References

Ehrlich, P. R., D. S. Dobkin and D. Wheye. 1988. *The Birder's Handbook*. Simon and Schuster, Inc., New York. P.180.

Farrand, J., Jr. 1983. *The Audubon Society Master Guide to Birding*. Vol. 2: Gulls to dippers. Alfred A. Knopf, New York. Pp. 92-93.

Peterson, D. M. 1988. Common tern, *Sterna hirundo*. Pages 178-179 in R. F. Andrie and J. R. Carroll, Eds. *The Atlas of Breeding Birds in New York State*. Cornell Univ. Press, Ithaca, NY.

Terres, J. R. 1980. *The Audubon Society Encyclopedia of North American Birds*. Alfred A. Knopf, New York. P. 468.

Drawing by Karen L. Allaben-Confer

For additional information contact:

Endangered Species Unit
NYSDEC
625 Broadway
Albany, NY 12233-4754

PIPING PLOVER

Federally Threatened Species

Nesting areas are symbolically fenced with posts and string and each nest may have a wire enclosure in place around the eggs. People and pets may not enter these areas. The birds will react to a disturbance by faking a broken wing, flying in circles overhead and “peeping” loudly. If a bird is reacting in this manner, it is being harassed. Whatever activity is causing the bird to act this way should be stopped immediately.



Adult Piping Plover

LEAST TERN

New York State Threatened Species

Nest colonies are protected with symbolic fencing and signs. People and pets may not enter these areas. Disturbed terns will attempt to drive away intruders by diving at them and crying sharply. Those being “dive bombed” in this manner are disturbing the birds. Passing outside the fencing in front of a tern colony may cause



VIPEO

COMMON TERN

New York State Threatened Species

These birds only occasionally nest on the mainland but are often found on the beaches. While they are here they are protected by law from any harassment.



ROSEATE TERN

Federally Endangered Species

These birds only occasionally nest on the mainland, but may be found feeding and roosting on our beaches. They are protected by the Endangered Species Act from any form of take.



Seabeach Amaranth Identification Guide

Photos & Guide by Steve Young – NY Natural Heritage
Program – June 2000



Typical plant



Scattered plants on the beach



Fruits along stems under leaves

***Amaranthus pumilus*, Seabeach amaranth
Survey Report 2018**

Site Name: _____ **Town:** _____

Date(s) of Survey: _____

Organization undertaking survey: _____

Observer(s): _____

Contact numbers or email: _____

Weather Conditions: _____

Directions to Site: _____

East boundary of count _____

West boundary of count _____

Present (Y/N) _____ **Number of Plants if Counted** _____

Counting Method: each plant flagged and counted sweep count general estimate

Plant Vigor: most plants < 6" wide most plants > 6" wide a mix of large and **small**

Current Threats: vehicle traffic foot traffic other (add to additional notes)

What percent of plants are within shorebird fencing? _____

Additional Notes:

Use the back of this form to sketch plant locations on site or mark on a topo map or aerial photo.

Please send completed forms to:

Steve Sinkevich
U.S. Fish and Wildlife Service
Long Island Field Office
340 Smith Road
Shirley, N.Y. 11967

Or e-mail scanned form to: Steve_sinkevich@fws.gov

For additional information contact Steve Sinkevich at 631-286-0485 or
Steve_sinkevich@fws.gov



***Polygonum glaucum*, Seabeach knotweed**



- ◆ Coastal annual plant considered rare in New York
- ◆ Range is Massachusetts to Florida
- ◆ Gray-green in color
- ◆ Observed June-October
- ◆ Flowers and sets seed late summer-early fall
- ◆ Spreads along the sand at or above the high tide line
- ◆ Threats include loss of habitat due to coastal development and crushing by off-road vehicles

Please look for seabeach knotweed while surveying for piping plovers and least terns. At a minimum, note absence or presence on site, or if at all possible, conduct actual counts. Any data you could provide would be greatly appreciated.

For information or to report knotweed survey results, please contact Joseph Jannsen at (631) 367-3225 ext. 122, or via e-mail at jjannsen@tnc.org. Thank you.

Please send completed survey forms to:

Joseph Jannsen
The Nature Conservancy on Long Island
250 Lawrence Hill Road
Cold Spring Harbor, NY 11724



SAVING THE LAST GREAT PLACES ON EARTH

Polygonum glaucum, Seabeach knotweed **Survey Report**

Site Name: _____ Town: _____

Date(s) of Survey: _____

Observer(s): _____

Weather Conditions: _____

Directions to Site: _____

East boundary of
count: _____

West boundary of count: _____

Present (Y/N) _____ Number of Plants if Counted _____

Counting Method: each plant flagged & counted sweep count general estimate

Plant Vigor: most plants < 6" wide most plants > 6" wide a mix of large & small

Current Threats: vehicle traffic foot traffic other (add to additional notes)

Additional Notes: _____

Use the back of this form to sketch plant locations on site.

Please send completed forms to:
Joseph Jannsen
The Nature Conservancy on Long Island
250 Lawrence Hill Road
Cold Spring Harbor, NY 11724

For additional information contact Joseph Jannsen at (631) 367-3225 ext. 122 or via e-mail at jjannsen@tnc.org. Thank you.

Section Six

Management

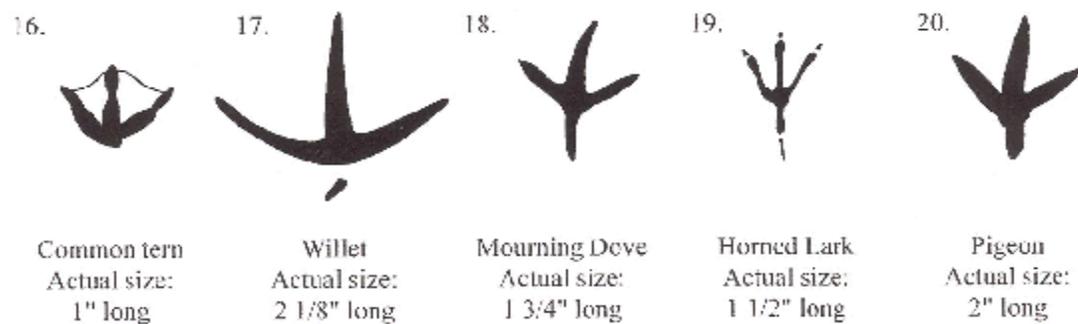
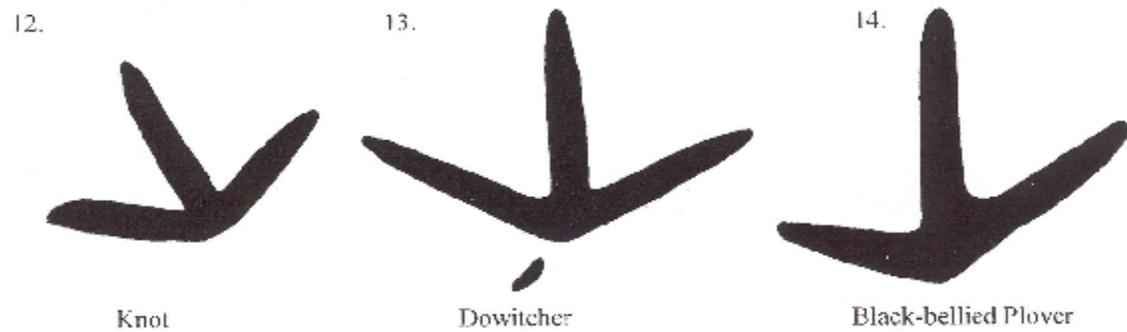
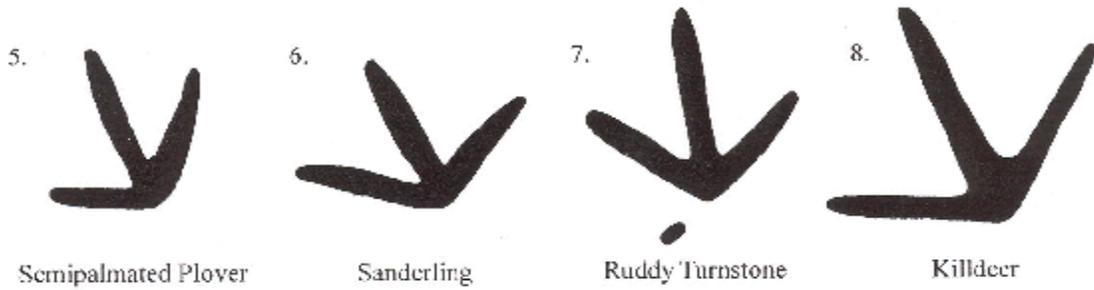
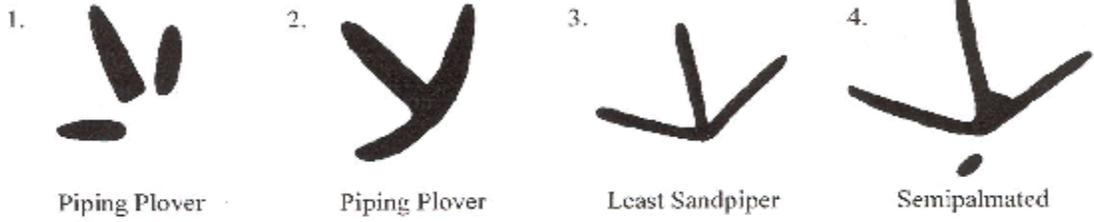


Adult Piping Plover

- *Shorebird and Other Bird Tracks*
- *Guidelines for Managing Recreational Activities*
- *Guidelines for Predator Exclosures*

Shorebird and Other Bird Tracks *Massachusetts Audubon Society*

Tracks 1 through 14 depicted actual size



Recovery Plan: Appendix G

Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take Under Section 9 of the Endangered Species Act

NOTE: A [stand-alone version](#) of these guidelines dated April 15, 1994 is available, on request, from the U.S. Fish and Wildlife Service, Weir Hill Road, Sudbury, MA 01776, Attn: Anne Hecht or by clicking on the link above. The stand-alone version also includes a brief synopsis of the legal requirements that afford protection to nesting piping plovers, a brief summary of the life history of piping plovers and potential threats due to recreational activities during the breeding cycle, and literature cited. The guidelines were revised in 2015 to account for later fledge ages.

The following information is provided as guidance to beach managers and property owners seeking to avoid potential violations of Section 9 of the Endangered Species Act (16 U.S.C. 1538) and its implementing regulations (50 CFR Part 17) that could occur as the result of recreational activities on beaches used by breeding piping plovers along the Atlantic Coast. These guidelines were developed by the Northeast Region, U.S. Fish and Wildlife Service (Service), with assistance from the U.S. Atlantic Coast Piping Plover Recovery Team. The guidelines are advisory, and failure to implement them does not, of itself, constitute a violation of the law. Rather, they represent the Service's best professional advice to beach managers and landowners regarding the management options that will prevent direct mortality, harm, or harassment of piping plovers and their eggs due to recreational activities.

Some land managers have threatened and endangered species protection obligations under Section 7 of the Endangered Species Act or under Executive Orders 11644 and 11989 (see pages 47-48) that go beyond adherence to these guidelines. Nothing in this document should be construed as lack of endorsement of additional piping plover protection measures implemented by these land managers or those who are voluntarily undertaking stronger plover protection measures.

The Service recommends the following protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks.

Addendum Regarding Timing of Management to Protect Unfledged Chicks

March 9, 2015

The purpose of this addendum is to provide recent information regarding the phenology of Atlantic Coast piping plovers that may have management implications for beach managers and property owners seeking to avoid potential violations of Section 9 of the Endangered Species Act (16 U.S.C. 1538) and its implementing regulations (50 CFR Part 17). The guidelines are advisory, and failure to implement them does not, of itself, constitute a violation of the law. Rather, they represent the U.S. Fish and Wildlife Service's best professional advice to beach managers and landowners regarding the management options that will prevent direct mortality, harm, or harassment of piping plovers and their eggs due to recreational activities.

Addendum

1. The April 15, 1994 Guidelines for Managing Recreational Activities in Piping Plover Breeding Habitat on the U.S. Atlantic Coast to Avoid Take under Section 9 of the Endangered Species Act (Guidelines) state that “Restrictions on use of vehicles in areas where unfledged plover chicks are present should begin on or before the date that hatching begins and continue until chicks have fledged. For purposes of vehicle management, plover chicks are considered fledged at 35 days of age or when observed in sustained flight for at least 15 meters, whichever occurs first.” This language is now amended as follows:

Restrictions on use of vehicles in areas where unfledged plover chicks are present should begin on or before the date that hatching begins and continue until chicks have fledged. For purposes of management, plover chicks are considered fledged when observed in sustained flight for at least 15 meters, irrespective of age. In most cases, piping plovers attain flight capability by 35 days of age, but longer pre-fledge periods may occur (*italics denotes new wording*).

We note that it is unnecessary and potentially counter-productive to repeatedly attempt to “flight test” piping plover chicks by trying to flush them. Fledglings will readily demonstrate flight capability as soon as their primary feathers become sufficiently developed.

2. The Guidelines also state that, when plover nests are found after the last egg has been laid (making it impossible to predict hatch date), sites without intensive monitoring should begin restrictions on nonessential vehicles on May 15. This language is now amended as follows:

When plover nests are found after the last egg has been laid, making it impossible to predict hatch date, restrictions on vehicles should begin on a date determined by one of the following scenarios:

1) With intensive monitoring: If the nest is monitored at least twice per day, at dawn and dusk (before 0600 hrs and after 1900 hrs) by a qualified biologist, vehicle use may continue until hatching begins. Nests should be monitored at dawn and dusk to minimize the time that hatching may go undetected if it occurs after dark. Whenever possible, nests should be monitored from a distance with spotting scope or binoculars to minimize disturbance to incubating plovers. OR

2) Without intensive monitoring: Restrictions should begin on May 10 (the earliest probable hatch date). If the nest is discovered after May 10, then restrictions should start immediately (*italics denotes new wording*).

Discussion

The dates and intervals associated with piping plover breeding cycle stages in the 1994 Guidelines were formulated following an extensive review of the large volume of available breeding records. They were intended to furnish reliable advice to land managers seeking to avoid violations of the Endangered Species Act without causing unnecessary restrictions on beach recreation. Review of monitoring reports routinely includes dates of piping plover arrival, nest initiation, hatching, and fledging. As of 2010, the U.S. Fish and Wildlife Service (Service) was unaware of deviations in breeding phenology with implications for management.

Since 2011, however, the Service has received occasional reports of unusually delayed fledging periods, early hatch dates, and other phenological “anomalies.” Piping plovers

older than 35 days that are incapable of flight have now been reported from several widely distributed sites in Massachusetts, New York, and Maryland. A few hatch dates prior to May 15 have been reported from New Jersey, Virginia, and North Carolina; given the overall synchrony of piping plover chronology across the U.S. Atlantic breeding range, we cannot rule out the potential for early hatching anywhere from Maine to North Carolina. The Service has solicited information about potential contributing factors (e.g., evidence that prey is limited, harsh weather, unusual disturbance), but rare events are inherently difficult to interpret. To the best of our knowledge, these situations remain rare, but we continue to request reports of such instances and any potential causal factors. At this time, the Service is furnishing this information to help managers provide reliable expectations to the beach-going public.

1994 Guidelines for Managing Recreational Activities

Management of Non-motorized Recreational Uses

On beaches where pedestrians, joggers, sun-bathers, picnickers, fishermen, boaters, horseback riders, or other recreational users are present in numbers that could harm or disturb incubating plovers, their eggs, or chicks, areas of at least 50 meter-radius around nests above the high tide line should be delineated with warning signs and symbolic fencing⁽¹⁾. Only persons engaged in rare species monitoring, management, or research activities should enter posted areas. These areas should remain fenced as long as viable eggs or unfledged chicks are present. Fencing is intended to prevent accidental crushing of nests and repeated flushing of incubating adults, and to provide an area where chicks can rest and seek shelter when large numbers of people are on the beach.

Available data indicate that a 50 meter buffer distance around nests will be adequate to prevent harassment of the majority of incubating piping plovers. However, fencing around nests should be expanded in cases where the standard 50 meter-radius is inadequate to protect incubating adults or unfledged chicks from harm or disturbance. Data from various sites distributed across the plover's Atlantic Coast range indicates that larger buffers may be needed in some locations (see Table 3, page 12). This may include situations where plovers are especially intolerant of human presence, or where a 50 meter-radius area provides insufficient escape cover or alternative foraging opportunities for plover chicks.⁽²⁾

In cases where the nest is located less than 50 meters above the high tide line, fencing should be situated at the high tide line, and a qualified biologist should monitor responses of the birds to passersby, documenting his/her observations in clearly recorded field notes. Providing that birds are not exhibiting signs of disturbance, this smaller buffer may be maintained in such cases.

On portions of beaches that receive heavy human use, areas where territorial plovers are observed should be symbolically fenced to prevent disruption of territorial displays and courtship. Since nests can be difficult to locate, especially during egg-laying, this will also prevent accidental crushing of undetected nests. If nests are discovered outside fenced areas, fencing should be extended to create a sufficient buffer to prevent disturbance to incubating adults, eggs, or unfledged chicks.

Pets should be leashed and under control of their owners at all times from April 1 to August 31 on beaches where piping plovers are present or have traditionally nested. Pets should be

prohibited on these beaches from April 1 through August 31 if, based on observations and experience, pet owners fail to keep pets leashed and under control.

Kite flying should be prohibited within 200 meters of nesting or territorial adult or unfledged juvenile piping plovers between April 1 and August 31.

Fireworks should be prohibited on beaches where plovers nest from April 1 until all chicks are fledged.

Motor Vehicle Management

The Service recommends the following minimum protection measures to prevent direct mortality or harassment of piping plovers, their eggs, and chicks on beaches where vehicles are permitted. Since restrictions to protect unfledged chicks often impede vehicle access along a barrier spit, a number of management options affecting the timing and size of vehicle closures are presented here. Some of these options are contingent on implementation of intensive plover monitoring and management plans by qualified biologists. It is recommended that landowners seek concurrence with such monitoring plans from either the Service or the State wildlife agency.

Protection of Nests

All suitable piping plover nesting habitat should be identified by a qualified biologist and delineated with posts and warning signs or symbolic fencing on or before April 1 each year. All vehicular access into or through posted nesting habitat should be prohibited. However, prior to hatching, vehicles may pass by such areas along designated vehicle corridors established along the outside edge of plover nesting habitat. Vehicles may also park outside delineated nesting habitat, if beach width and configuration and tidal conditions allow. Vehicle corridors or parking areas should be moved, constricted, or temporarily closed if territorial, courting, or nesting plovers are disturbed by passing or parked vehicles, or if disturbance is anticipated because of unusual tides or expected increases in vehicle use during weekends, holidays, or special events.

If data from several years of plover monitoring suggests that significantly more habitat is available than the local plover population can occupy, some suitable habitat may be left unposted if the following conditions are met:

1. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:
 - A. Estimates the number of pairs likely to nest on the site based on the past monitoring and regional population trends.

AND

- B. Delineates the habitat that will be posted or fenced prior to April 1 to assure a high probability that territorial plovers will select protected areas in which to court and nest. Sites where nesting or courting plovers were observed during the

last three seasons as well as other habitat deemed most likely to be pioneered by plovers should be included in the posted and/or fenced area.

AND

- C. Provides for monitoring of piping plovers on the beach by a qualified biologist(s). Generally, the frequency of monitoring should be not less than twice per week prior to May 1 and not less than three times per week thereafter. Monitoring should occur daily whenever moderate to large numbers of vehicles are on the beach. Monitors should document locations of territorial or courting plovers, nest locations, and observations of any reactions of incubating birds to pedestrian or vehicular disturbance.

AND

- 2. All unposted sites are posted immediately upon detection of territorial plovers.

Protection of Chicks

Sections of beaches where unfledged piping plover chicks are present should be temporarily closed to all vehicles not deemed essential. (See the provisions for essential vehicles below.) Areas where vehicles are prohibited should include all dune, beach, and intertidal habitat within the chicks' foraging range, to be determined by either of the following methods:

- 1. The vehicle free area should extend 1000 meters on each side of a line drawn through the nest site and perpendicular to the long axis of the beach. The resulting 2000 meter-wide area of protected habitat for plover chicks should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles.

OR

- 2. The Service OR a State wildlife agency that is party to an agreement under Section 6 of the ESA provides written concurrence with a plan that:
 - A. Provides for monitoring of all broods during the chick-rearing phase of the breeding season and specifies the frequency of monitoring.

AND

- B. Specifies the minimum size of vehicle-free areas to be established in the vicinity of unfledged broods based on the mobility of broods observed on the site in past years and on the frequency of monitoring. Unless substantial data from past years show that broods on a site stay very close to their nest locations, vehicle-free areas should extend at least 200 meters on each side of the nest site during the

first week following hatching. The size and location of the protected area should be adjusted in response to the observed mobility of the brood, but in no case should it be reduced to less than 100 meters on each side of the brood. In some cases, highly mobile broods may require protected areas up to 1000 meters, even where they are intensively monitored. Protected areas should extend from the ocean-side low water line to the bay-side low water line or to the farthest extent of dune habitat if no bay-side intertidal habitat exists. However, vehicles may be allowed to pass through portions of the protected area that are considered inaccessible to plover chicks because of steep topography, dense vegetation, or other naturally-occurring obstacles. In a few cases, where several years of data documents that piping plovers on a particular site feed in only certain habitat types, the Service or the State wildlife management agency may provide written concurrence that vehicles pose no danger to plovers in other specified habitats on that site.

Timing of Vehicle Restrictions in Chick Habitat

Restrictions on use of vehicles in areas where unfledged plover chicks are present should begin on or before the date that hatching begins and continue until chicks have fledged. For purposes of vehicle management, plover chicks are considered fledged at 35 days of age or when observed in sustained flight for at least 15 meters, whichever occurs first.

When piping plover nests are found before the last egg is laid, restrictions on vehicles should begin on the 26th day after the last egg is laid. This assumes an average incubation period of 27 days, and provides a 1 day margin of error.

When plover nests are found after the last egg has been laid, making it impossible to predict hatch date, restrictions on vehicles should begin on a date determined by one of the following scenarios:

1. With intensive monitoring: If the nest is monitored at least twice per day, at dawn and dusk (before 0600 hrs and after 1900 hrs) by a qualified biologist, vehicle use may continue until hatching begins. Nests should be monitored at dawn and dusk to minimize the time that hatching may go undetected if it occurs after dark. Whenever possible, nests should be monitored from a distance with spotting scope or binoculars to minimize disturbance to incubating plovers.

OR

2. Without intensive monitoring: Restrictions should begin on May 15 (the earliest probable hatch date). If the nest is discovered after May 15, then restrictions should start immediately.

If hatching occurs earlier than expected, or chicks are discovered from an unreported nest, restrictions on vehicles should begin immediately.

If ruts are present that are deep enough to restrict movements of plover chicks, then restrictions on vehicles should begin at least 5 days prior to the anticipated hatching date of plover nests. If a plover nest is found with a complete clutch, precluding estimation of hatching date, and deep ruts have been created that could reasonably be expected to impede chick movements, then restrictions on vehicles should begin immediately.

Essential Vehicles

Because it is impossible to completely eliminate the possibility that a vehicle will accidentally crush an unfledged plover chicks, use of vehicles in the vicinity of broods should be avoided whenever possible. However, the Service recognizes that life-threatening situations on the beach may require emergency vehicle response. Furthermore, some "essential vehicles" may be required to provide for safety of pedestrian recreationists, law enforcement, maintenance of public property, or access to private dwellings not otherwise accessible. On large beaches, maintaining the frequency of plover monitoring required to minimize the size and duration of vehicle closures may necessitate the use of vehicles by plover monitors.

Essential vehicles should only travel on sections of beaches where unfledged plover chicks are present if such travel is absolutely necessary and no other reasonable travel routes are available. All steps should be taken to minimize number of trips by essential vehicles through chick habitat areas. Homeowners should consider other means of access, e.g., by foot, water, or shuttle services, during periods when chicks are present.

The following procedures should be followed to minimize the probability that chicks will be crushed by essential (non-emergency) vehicles:

1. Essential vehicles should travel through chick habitat areas only during daylight hours, and should be guided by a qualified monitor who has first determined the location of all unfledged plover chicks.
2. Speed of vehicles should not exceed five miles per hour.
3. Use of open 4-wheel motorized all-terrain vehicles (ATVs) or non-motorized all-terrain bicycles is recommended whenever possible for monitoring and law enforcement because of the improved visibility afforded operators.
4. A log should be maintained by the beach manager of the date, time, vehicle number and operator, and purpose of each trip through areas where unfledged chicks are present. Personnel monitoring plovers should maintain and regularly update a log of the numbers and locations of unfledged plover chicks on each beach. Drivers of essential vehicles should review the log each day to determine the most recent number and location of unfledged chicks.

Essential vehicles should avoid driving on the wrack line, and travel should be infrequent enough to avoid creating deep ruts that could impede chick movements. If essential vehicles are creating ruts that could impede chick movements, use of essential vehicles should be further reduced and, if necessary, restricted to emergency vehicles only.

Site-Specific Management Guidance

The guidelines provided in this document are based on an extensive review of the scientific literature and are intended to cover the vast majority of situations likely to be encountered on piping plover nesting sites along the U.S. Atlantic Coast. However, the Service recognizes that site-specific conditions may lead to anomalous situations in which departures from this guidance may be safely implemented. The Service recommends that landowners who believe such situations exist on their lands contact either the Service or the State wildlife agency and, if appropriate, arrange for an on-site review. Written documentation of agreements regarding departures from this guidance is recommended.

In some unusual circumstances, Service or State biologists may recognize situations where this guidance provides insufficient protection for piping plovers or their nests. In such a case, the Service or the State wildlife agency may provide written notice to the landowner describing additional measures recommended to prevent take of piping plovers on that site.

¹ "Symbolic fencing" refers to one or two strands of light-weight string, tied between posts to delineate areas where pedestrians and vehicles should not enter.

² For example, on the basis of data from an intensive three year study that showed that plovers on Assateague Island in Maryland flush from nests at greater distances than those elsewhere (Loefering 1992), the Assateague Island National Seashore established 200 meter buffers zones around most nest sites and primary foraging areas (NPS 1993b). Following a precipitous drop in numbers of nesting plover pairs in Delaware in the late 1980's, that State adopted a Piping Plover Management Plan that provided 100 yard buffers around nests on State park lands and included intertidal areas (DNREC 1990).

GUIDELINES FOR REPORTING ENCLOSURE ENTANGLEMENT

Weir Hill Road
Sudbury, Massachusetts 01776

Dear State Piping Plover Coordinators:

Last week, we received a report of a piping plover that died after becoming entangled in the net top of a predator enclosure. This incident involved the 3/4" square mesh netting that, to our knowledge, had not been associated with any prior entanglements.

In order to help us to determine how to prevent these incidents, we need to gather detailed information about how any entanglement occurs. Therefore, we are asking you to immediately pass this information request along to all individuals that you authorize to use enclosures.

Before disturbing the enclosure or bird, any person finding a dead plover entangled in a predator enclosure should collect the following information, if available:

1. Sketches and/or photographs:
 - a) from various angles close-up at the points of entanglement
 - b) showing the general location of the bird on the enclosure (for example, middle of top, edge of top, edge of netting on side of enclosure)

If the monitor is not carrying a camera and a store is nearby, please consider sending someone to purchase a disposable camera.

2. Detailed notes describing:
 - a) the parts of the bird (head, wing, foot, etc.) that are entangled
 - b) how the bird and netting or twine are entangled (for example, is the part "punched through" the netting? Did the bird rip through the netting? How is the twine wrapped around the wing? How many centimeters or inches from the tip of the wing is the entanglement?)
3. Any evidence of tracks (animal or human) that may have approached the enclosure and assessment of whether such an encroachment could have been a factor contributing to the entanglement.
4. Weather conditions since the last observation of the enclosure prior to the incident.
5. Any other observation that may be relevant.

- Dates and time when:
- the enclosure was constructed;
- the enclosure was last monitored prior to the entanglement; and
- the entanglement was discovered

If possible, please cut the netting or twine down without detaching the bird (leave 12-24" of netting on each side of the bird) and transport them together to a refrigerator or freezer.

In situations where the plover is alive, the monitor's first priority must, of course, be to carefully rescue the bird and determine whether it should be transported to a veterinary facility or be released immediately. Once the bird no longer requires the monitor's attention, however, he/she should immediately document all available information on the list above.

As always please notify me as soon as possible about such incidents (phone 508-443-4325; fax 508-443-2898). Please fax copies of notes and sketches and mail me samples of the netting, twine, or other material that entangled the bird and copies of photos.

We realize that finding an entangled plover is a very distressing experience for a monitor. However, collecting good information is key to preventing future incidents. Please emphasize to your monitors how important it is for them to "keep cool" and make accurate, complete, and detailed notes and sketches.

Thank you for your help resolving this very important concern.

Sincerely,

Anne Hecht
Endangered Species Biologist

cc: ES Field Offices, Refuges, and LE (via cmail)

Appendix One

2018 Long Island Colonial Waterbird & Plover Survey Instructions & Forms
Hatch & Fledge Dates
Plover Chick Aging Guide



2018 PIPING PLOVER PRODUCTIVITY SURVEY SITE SUMMARY FORM



New York State Department of Environmental Conservation
Bureau of Wildlife, SUNY @ Stony Brook,
50 Circle Road, Stony Brook NY 11790-3409
Phone (631) 444-0307 Fax (631) 444-0272

GENERAL INSTRUCTIONS:

1. Use **no. 2 pencil**. Remember - it may be necessary to make copies so pencil should be dark enough to copy well.
2. Important: fill in **all sections of the form** and **label the map** as instructed.
3. Send completed **form and map** with nest/colony locations to the above address by **September 1!!!**
4. This form is to be used **only for the areas indicated on the corresponding map**.

Site name: _____

Town: _____ Owner: _____

Observers: _____

Total no. of pairs at the site: _____ **Total no. of nests:** _____ **Total no of eggs laid:** _____

Total no. of chicks hatched: _____ **Hatch rate (chicks/eggs):** _____

Total no. of chicks fledged: _____ **Fledge Rate (fledge/chicks):** _____

Total Productivity at the site (fledged per pair): _____ **First & last date plovers observed:** _____

Confidence rating for the site (see reverse side for criteria): _____ **Total no. of visits:** _____

Management activities at the site: _____

Disturbances to the site: _____

Potential predators at the site: _____

Tern activity: (if known, species, number of adults, nests or fledglings, first and last observed dates, etc.): _____

Comments (location of critical plover foraging areas, problems with exclosures, etc.): _____

CONFIDENCE RATING FOR NEW YORK PIPING PLOVER PRODUCTIVITY DATA

In order to collect accurate productivity data for piping plovers, site monitoring of 3 days/week or more is recommended. Due to staff shortages, many sites on Long Island cannot be monitored this frequently. For this reason, the following confidence ratings have been developed

Confidence ratings should be assigned by site, not for each nest. However, in some cases, monitors may have varying confidence ratings for different portions of a site, usually as a result of varying nest check frequency. For example, at one survey site in 1994 with a total of 18 pairs, a plover biologist monitored one segment of the site with 13 pairs 3-4 times/week throughout the summer, yet another section of the site with 5 pairs was only monitored 2 times/summer. A confidence rating of A was assigned to the area with 13 pairs, and a confidence rating of D was assigned to the area with 5 pairs. The 13 pairs were include in the statewide average, the 5 pairs were not. Though dividing a site like this is better than excluding high confidence data because some data within the site is low confidence, it is necessary to be careful not to bias the productivity estimate towards pairs that are more or less successful than average.

Please assign each survey site a confidence rating based on the following categories.

- A =**
1. All fledglings in the total were seen by plover biologists or another qualified individual either in sustained flight for ≥ 15 meters or at least 25 days old.
 2. It is very unlikely that any chicks fledged without being documented.
 3. It is very unlikely that fledglings in the total for this site came from another site.
 4. You are highly confident that you did not over count or under count the total number of pairs (ex. You did not count a renest as an additional pair, or vice versa).
 5. You are confident that no nests were undetected
 6. The fate of all eggs is known (i.e. either there is a suspected cause of egg loss, or chicks are known to have hatched).
- B =**
1. Same as "A"
 2. The possibility exists that additional chicks fledged. Ex. At a site where observations are difficult (chicks forage within beach grass or behind dunes), 3 chicks were consistently seen in a brood until 20 days old, after that only 2 chicks were seen. A 3rd chick may have been present, but undetected.
 3. Same as "A"
 4. You are moderately confident that you did not over count or under count the total number of pairs, though a slight margin of error exists. Ex. A renest may have been counted as an additional pair, or an additional pair may have been counted as a renest.
 5. It is possible that nests were undetected. Ex. 1st nests were found late in the season (end of May and after). They were probably re-nests, though you are not sure from where.
 6. Same as "A"
- C =**
1. Chicks were seen at ≥ 20 days old, appearing healthy, and you have no reason to believe they did not fledge.
 2. Same as "B"
 3. It is possible the fledglings you saw at this site came from another site. Ex. 2 chicks from a brood were not seen between ages 15-27 days old, but at 27 days old 1 fledgling at the site was observed. The fledgling could have come from an adjacent site which produced fledglings.
 4. It is possible the total number of pairs was over counted or under counted, i.e. you could never get an exact count on the total number of pairs for reasons such as re-nesting, territoriality or defensive behaviors.
 5. Same as "B"
 6. The fate of nests with eggs was not known for all pairs. Ex. The nest was missing around the time of the hatch date, with no signs of predation, yet chicks not seen.
- D =** Qualifying criteria for A, B, or C cannot be met. The number of fledglings and/or total number of pairs cannot be determined.

LONG ISLAND COLONIAL WATERBIRD AND PIPING PLOVER SURVEY (PIPING PLOVER, TERNS, BLACK SKIMMER)

New York State Department of Environmental Conservation
Bureau of Wildlife, Stony Brook University, 50 Circle Road, Stony Brook, NY 11790-2356 phone (631) 444-0307 fax (631) 444-0272

GENERAL INSTRUCTIONS:

1. Use **no. 2 pencil**. Remember - it may be necessary to make copies, so pencil should be dark enough to copy well.
2. Important: fill in **all sections of the form** and **label the map** as instructed.
3. Send completed **form and map** with nest/colony locations (including forms for inactive sites) to the above address by **August 1**.
4. This form is to be used **only for the areas indicated on the corresponding map**. **All habitat within the site should be searched**.
5. If birds are found **outside of the site boundary** on the attached map, **do not include this information on this form or map**. Treat this as a **new site**. Complete a **new form** and attach a **new map** indicating the precise location of the new birds and/or colony. See detailed instructions.

YEAR OF SURVEY: **2018**

SITE INFORMATION:

Site name: _____

Town: _____

USGS topo map: _____

Directions to site (include how to get there, distances, problems with access): _____

Owner (name/address/phone): _____

Contact person for protection needs (name/organization/phone): _____

OBSERVER INFORMATION:

Recorder's name: _____ Phone: work or home? _____

Organization/affiliation: _____ e-mail address: _____

Address _____
street city state zip code

Additional observers: _____

CURRENT DISTURBANCE FACTORS (check as appropriate):

Boats Development Flooding Pedestrians Vehicles

Predators (what kind? crows gulls fox feral cats raccoons other predator: _____)

Other disturbance factor(s) (specify): _____

Disturbance comments (elaborate on noted disturbances): _____

MANAGEMENT INFORMATION (check as appropriate):

Posted? yes no unknown

Fenced? yes no unknown If yes, what type of fencing? string snow electric

If site is not posted/fenced, why? unknown remote location lack of permission other: _____

Current predator control? yes no unknown If yes, what type of control? _____

Management recommendations: _____

COMMENTS/SUGGESTIONS (Nesting habitat, foraging habitat): _____

PIPING PLOVERS Survey must be conducted **ONCE** between **June 1 and June 9**. **All habitat within the site should be searched.**

MAP: It is **ESSENTIAL** that you clearly label the map with the following information. See the example of a correctly labeled map below.

- Draw the **LOCATION** of plover nests/pairs with a dark **X**. If no birds were observed, indicate the area surveyed in **pencil**.
- Write the species code (**PIPL**), the **NUMBER OF BIRDS** and the **DATE OBSERVED** next to the "X" location on the map (see example).

TABLE:

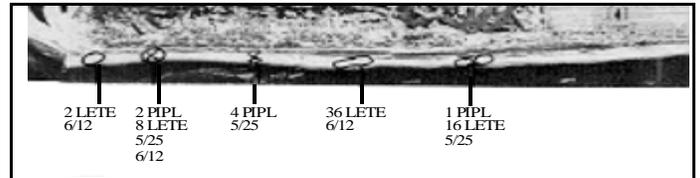
- If the site is active, fill in **all** columns in the table below and label the map.
- If **no** plovers/nests were seen, write the **DATE** of the survey and **"INACTIVE"** in the "Total No. of Adults" column.
- All other adults, whether non-breeders or transients, should be recorded but listed separate from breeding pairs. See enclosed instructions.

DATE OF SURVEY PIPING PLOVER (1 survey June 1-June 9)	START TIME (military) (e.g. 9am=0900, 1pm=1300)	SPECIES FOUND CODE Piping plover PIPL	MAP (check box below after drawing location on map)	TOTAL NUMBER OF ADULTS (from map)	ESTIMATED NO. OF PAIRS (from map)	COMMENTS	OBSERVER INITIALS

OFFICE USE ONLY (Piping plover survey results)

Count	Number of pairs	Number of unpaired adults
Index count (June 1 - June 9)		
Total count		

EXAMPLE OF A PORTION OF A CORRECTLY LABELED AERIAL MAP



«Site Name»

TERN/BLACK SKIMMER COLONIES Survey must be conducted **TWICE** between **June 1 and June 30**, with one survey prior to June 15 and the second survey on or after June 15. **Allow at least one week between surveys. All habitat within the site should be searched.**

MAP: It is **ESSENTIAL** that you clearly label the corresponding map with the following information. See example of a correctly labeled map above.

- If breeding activity is observed, count all adults present. Draw a **CIRCLE** around **EACH SEPARATE COLONY LOCATION**. If no birds were observed, indicate area surveyed in **pencil** and record the survey date. **Do not record non breeding birds.**
- Write the **SPECIES CODE**, the **NUMBER OF INDIVIDUAL ADULTS** and the **DATE OBSERVED** next to the circled location on the map.

TABLE:

- If the site is active, fill in **all** columns in the table below and label the map.
- If there are **NO** breeding birds at the entire site, enter **INACTIVE** in the "Number of Individual Adults" box.

DATE OF SURVEY TERN/SKIMMER (2 surveys June 1 - June 30)	SPECIES FOUND Please use codes provided in survey instructions.	MAP Check box below after drawing location on map.	NUMBER OF INDIVIDUAL ADULTS (for the entire site)	OFFICE USE ONLY: ESTIMATED NO. OF PAIRS: Terns = adults x .9 BLSK = adults x .5	EVIDENCE OF PRODUCTIVITY (i.e. number of chicks or fledglings)	OBSERVER INITIALS
TERN/SKIMMER Survey no. 1 (prior to 6/15) Date: _____ Start time (military): _____						
Survey no. 2 (on or after 6/15) Date: _____ Start time (military): _____						

OFFICE USE ONLY (Tern and Black skimmer survey results)

Species found	Average no. of adults	Average no. of pairs	Comments



2018 PIPING PLOVER PRODUCTIVITY SURVEY PAIR SUMMARY AND EXCLOSURE FORM



Department of
Environmental
Conservation

New York State Department of Environmental Conservation
Bureau of Wildlife, SUNY @ Stony Brook, 50 Circle Road, Stony Brook NY 11790
phone (631) 444-0307 fax (631) 444-0272

GENERAL INSTRUCTIONS:

1. Please fill out one sheet for each plover **pair** that is monitored for productivity.
 2. Please send completed form to the above address by September 1st.
- Up to 3 nest attempts for each pair may be recorded on this form, "A" indicates the first nest attempt, "B" the second and "C" the third.

Site name: _____ Pair number: _____
 Observers: _____ Pair productivity: _____
 First and last date pair was seen: _____

A Nest:

Nest location (use permanent landmarks): _____
 Date nest found: _____ No. of eggs when found: _____ Date clutch completed: _____
 No. of eggs when complete: _____ Hatch date: _____ No. of eggs hatched: _____
 Date and cause of nest failure: _____
 Date and cause of chick loss: _____
 Fledging date: _____ No. of chicks fledged: _____ Date exclosed: _____
 Reason(s) for exclosing: _____
 No. of eggs when exclosed: _____ Time to erect exclosure: _____ Time to resume incubation: _____
 Exclosure design: _____
 If exclosure failed possible cause/problems: _____

B Nest:

Nest location (use permanent landmarks): _____
 Date nest found: _____ No. of eggs when found: _____ Date clutch completed: _____
 No. of eggs when complete: _____ Hatch date: _____ No. of eggs hatched: _____
 Date and cause of nest failure: _____
 Date and cause of chick loss: _____
 Fledging date: _____ No. of chicks fledged: _____ Date exclosed: _____
 Reason(s) for exclosing: _____
 No. of eggs when exclosed: _____ Time to erect exclosure: _____ Time to resume incubation: _____
 Exclosure design: _____
 If exclosure failed possible cause/problems: _____

C Nest:

Nest location (use permanent landmarks): _____
 Date nest found: _____ No. of eggs when found: _____ Date clutch completed: _____
 No. of eggs when complete: _____ Hatch date: _____ No. of eggs hatched: _____
 Date and cause of nest failure: _____
 Date and cause of chick loss: _____
 Fledging date: _____ No. of chicks fledged: _____ Date exclosed: _____
 Reason(s) for exclosing: _____
 No. of eggs when exclosed: _____ Time to erect exclosure: _____ Time to resume incubation: _____
 Exclosure design: _____ If exclosure failed possible
 cause/problems: _____

Piping Plover - Hatch and Fledge Dates

Hatch Dates obtained by adding 27 days to the date clutch was complete. If clutch was found incomplete - estimate 1 egg laid every other day to obtain date clutch was complete, then add 27 days. If clutch was found complete - add 27 days, this is the latest possible hatch date.

Fledge Dates obtained by adding 25 days to the hatch date.

Date Clutch Complete	Estimated Hatch Date	Fledge Date	Date Clutch Complete	Estimated Hatch Date	Fledge Date	Date Clutch Complete	Estimated Hatch Date	Fledge Date
4/15	5/12	6/6	5/14	6/10	7/5	6/12	7/9	8/3
4/16	5/13	6/7	5/15	6/11	7/6	6/13	7/10	8/4
4/17	5/14	6/8	5/16	6/12	7/7	6/14	7/11	8/5
4/18	5/15	6/9	5/17	6/13	7/8	6/15	7/12	8/6
4/19	5/16	6/10	5/18	6/14	7/9	6/16	7/13	8/7
4/20	5/17	6/11	5/19	6/15	7/10	6/17	7/14	8/8
4/21	5/18	6/12	5/20	6/16	7/11	6/18	7/15	8/9
4/22	5/19	6/13	5/21	6/17	7/12	6/19	7/16	8/10
4/23	5/20	6/14	5/22	6/18	7/13	6/20	7/17	8/11
4/24	5/21	6/15	5/23	6/19	7/14	6/21	7/18	8/12
4/25	5/22	6/16	5/24	6/20	7/15	6/22	7/19	8/13
4/26	5/23	6/17	5/25	6/21	7/16	6/23	7/20	8/14
4/27	5/24	6/18	5/26	6/22	7/17	6/24	7/21	8/15
4/28	5/25	6/19	5/27	6/23	7/18	6/25	7/22	8/16
4/29	5/26	6/20	5/28	6/24	7/19	6/26	7/23	8/17
4/30	5/27	6/21	5/29	6/25	7/20	6/27	7/24	8/18
5/1	5/28	6/22	5/30	6/26	7/21	6/28	7/25	8/19
5/2	5/29	6/23	5/31	6/27	7/22	6/29	7/26	8/20
5/3	5/30	6/24	6/1	6/28	7/23	6/30	7/27	8/21
5/4	5/31	6/25	6/2	6/29	7/24	7/1	7/28	8/22
5/5	6/1	6/26	6/3	6/30	7/25	7/2	7/29	8/23
5/6	6/2	6/27	6/4	7/1	7/26	7/3	7/30	8/24
5/7	6/3	6/28	6/5	7/2	7/27	7/4	7/31	8/25
5/8	6/4	6/29	6/6	7/3	7/28	7/5	8/1	8/26
5/9	6/5	6/30	6/7	7/4	7/29	7/6	8/2	8/27
5/10	6/6	7/1	6/8	7/5	7/30	7/7	8/3	8/28
5/11	6/7	7/2	6/9	7/6	7/31	7/8	8/4	8/29
5/12	6/8	7/3	6/10	7/7	8/1	7/9	8/5	8/30
5/13	6/9	7/4	6/11	7/8	8/2	7/10	8/6	8/31

Plover Chick Aging Guide

Piping Plover

Age Class 1-5 days



4 Days Old

Plover chicks in Age Class 1-5 Days are distinguished by:

- A. entirely downy
- B. no sign of tail or wings at a distance
- C. as tall as adult's belly
- D. often brooded by an adult
- E. quite small in size, resembles a marshmallow with two toothpicks protruding out of the bottom.

Age Class 6-10 days

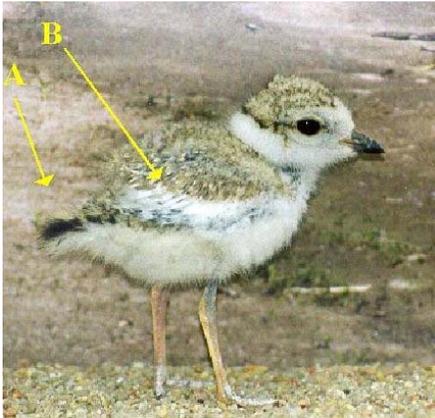


6 Days Old

Plover chicks in Age Class 6-10 Days are distinguished by:

- A. feather development
- B. small downy tail (B in top photo)
- C. wings still purely downy (C in bottom photo)
- D. at age 10 days, chick is about 1/3 the size of an adult

Age Class 11-15 days

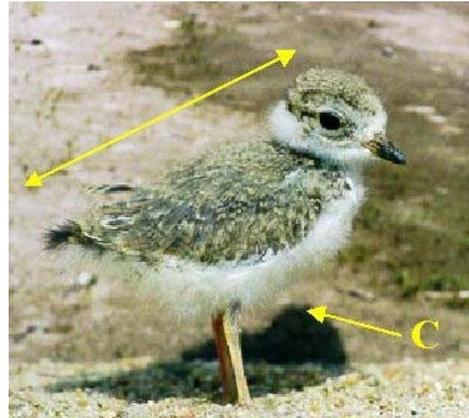


11 Days Old

Plover chicks in Age Class 11-15 Days are distinguished by:

- A. more defined tail but still downy
- B. feather tips of the primaries may be seen
- C. upper body color still mottled
- D. at age 15 days, chick is about 1/2 the size of an adult

Age Class 16-20 days



18 Days Old

Plover chicks in Age Class 16-20 Days are distinguished by:

- A. less compact shape, longer profile from head to tail (see top photo)
- B. mottled color begins to fade
- C. appears darker with smooth contour feathers over entire upper body
- D. at age 18 days, chick is about 2/3 the size of an adult

Age Class 21-24 days



21 Days Old

Plover chicks in Age Class 21-24 Days are distinguished by:

- A. primaries have grown almost to the length of the tail
- B. defined tail (see top photo)
- C. sleeker body and sleeker head
- D. close to adult height and size, but not fully feathered
- E. cannot fly

Age Class 25+ days - Fledged

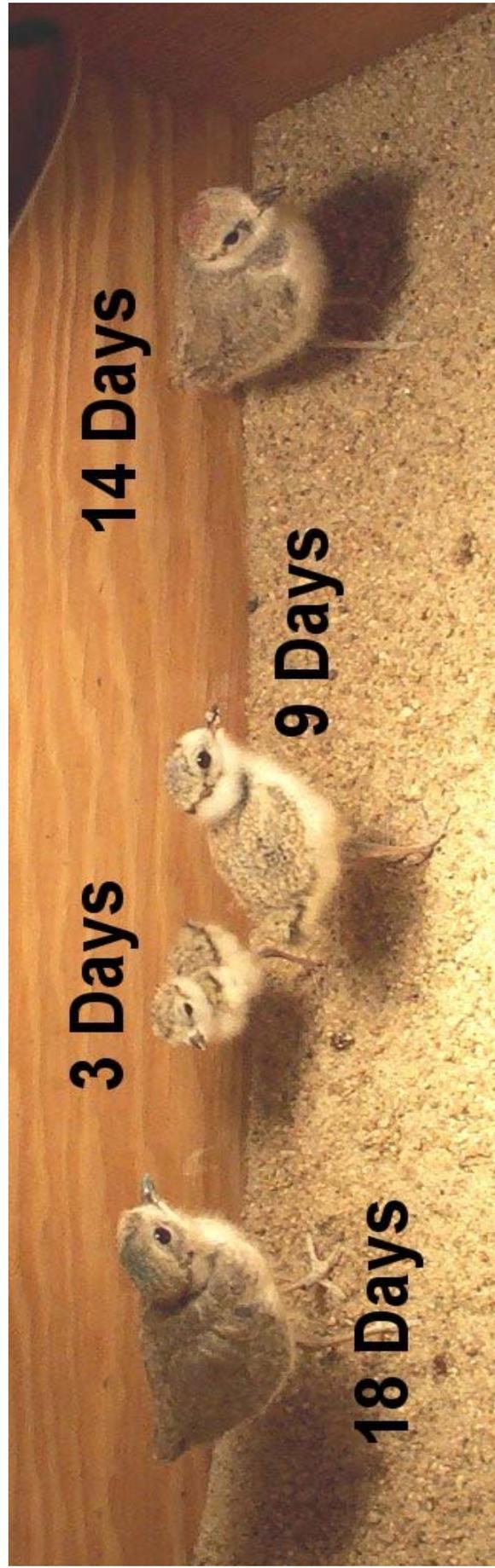


25+ Days Old

Fledged Plovers are distinguished by:

- A. fully developed primary feathers
- B. white under parts fully feathered, very little fuzzy down still visible
- C. close to adult height and size
- D. capable of sustained flight
- E. often seen without adult

Piping Plover Age Groups





U.S. Army Corps
of Engineers
Omaha District

Piping Plover Aging Guidelines



4 day old



6 day old



11 day old



18 day old



21 day old



24+ day old



1-5 Day

Age Class

- No visible wing or tail.
- Clearly defined black line between upper parts and lower parts.
- As tall as adult's belly.
- Often lies motionless when alarmed.

6-10 Day

Age Class

- Downy tail form emerging.
- Black line fading due to emerging feathers.
- Approx. 1/3 size of adult at 10 days.
- Very adept at feeding and mobile on feet.

11-15 Day

Age Class

- Feather shafts emerging on wing.
- Emerging contour feather shafts give bird a scaly appearance.
- Looks "chunky" as bird fills out.
- Rarely lies motionless; prefers to run when alarmed.

16-20 Day

Age Class

- Downy head.
- Contour feathers noticeably developed giving bird a rough fuzzy appearance.
- Approx. 1/2 the size of adult at 16 days.
- Less compact, longer profile from head to tail.

21-24 Day

Age Class

- Black wing tips and tail feathers noticeably protruding.
- Upper parts nearly fully feathered.
- Almost adult height by 22 days.
- Body begins to look sleek.
- Will take short hop flights.

24 + Day

Age Class

- Fully developed primary feathers.
- White underparts fully feathered, very little fuzzy down still visible.
- Capable of sustained flight.
- Often seen without adult.

Least Tern

Age Class 1-5 days



About 2 Days Old

Tern chicks in Age Class 1-5 Days are distinguished by:

- A. entirely downy
- B. yellow coloration with brown spots
- C. often will be found in or near the nest bowl
- D. quite small in size compared to other age classes

Age Class 6-10 days



About 9 Days Old

Tern chicks in Age Class 6-10 Days are distinguished by:

- A. coloration is still yellowish with brown mottles
- B. feather development seen on the wings
- C. at age 10 days, chick is about 1/2 the size of an adult
- D. will be spending more time in vegetation and will be more difficult to find



Least Tern Chicks, 1-5, 6-10 & 11-15 Day Old

Age Class 11-15 days



About 11 Days Old

Tern chicks in Age Class 11-15 Days are distinguished by:

- A. coloration on the top will change from yellow to brownish-gray mottle
- B. primaries continue to develop and elongate
- C. at age 15 days, chick is about 2/3 the size of an adult
- D. majority of time will be spent in vegetation hiding
- E. when running, will resemble a bowling pin, head will be erect

Age Class 16-20 days



About 18 Days Old

Tern chicks in Age Class 16-20 Days are distinguished by:

- A. similar in size and shape to adult, but a bit smaller and not fully feathered
- B. will be more visible and will spend more time near shoreline
- C. cannot fly

Age Class 21+ days - Fledged



- A. similar in size and shape to an adult
- B. forehead and top of head brownish gray
- C. black markings around eyes and the back of the head
- D. capable of sustained flight
- E. may still be fed by an adult



US Army Corps of Engineers
Omaha District

Least Tern Aging Guidelines



1-5 days old

- entirely downy
- yellow coloration with brown spots
- often in or near nest bowl
- quite small in size compared to other age classes



6-10 days old

- coloration is still yellowish with brown mottling
- feather development seen on wings
- at 10 days, chick is half the size of the adults.
- Will spend more time in vegetation and be difficult to find.

11-15 days old

- coloration on top will change to brown-gray mottle.
- Primaries continue to grow and elongate.
- at age 15 days, chick will be 2/3 the size of adult.
- Majority of time spend hiding in vegetation.
- When running, resembles a bowling pin, head will be erect.



16-20 days old

- similar in size and shape to adult
- not fully feathered
- will spend more time near shoreline
- cannot fly



Fledged

- similar in size and shape to adult
- forehead and top of head brownish gray
- black markings around eyes and back of head.
- capable of sustained flight

Appendix Two

Biology & Behavior of Piping Plovers
Mammalian & Avian Predator Tracks

BIOLOGY AND BEHAVIOR OF BREEDING PIPING PLOVERS

WINIFRED E. CAIRNS

The Piping Plover (*Charadrius melodus*) is an endemic species of central and eastern North America which breeds discontinuously throughout its range in suitable sand beach habitat. Apart from early accounts such as those by Bent (1929) and Wilcox (1939), a single study by Wilcox (1959) provides most of the breeding information known for the species. An assessment of the numerical status of the population in eastern North America is contained in Cairns and McLaren (1980). The present study was undertaken to obtain baseline information on the Piping Plover in Nova Scotia. Emphasis was placed on detailing the biology and behavior associated with the nesting cycle, and on examining the relationship between nesting success and the multiple use of beaches.

STUDY AREA AND METHODS

The major study area was at Cadden Beach, southern Nova Scotia (43°50'N, 64°50'W), and consisted of a sandspit 1.4 km long and 75-200 m wide. This broad, relatively flat expanse of unconsolidated sand was strewn with gravel, clods of peat, driftwood, and other debris. Across most of the spit vegetation was extremely scanty, consisting of seabeach sandwort (*Arenaria peploides*) and to a lesser extent marram grass (*Ammophila breviligulata*). Studies at this site were carried on from 1 May-15 August 1975 and from 22 April-10 August 1976. Additional data were obtained from May-August 1976 during visits to eight other beaches in Nova Scotia where *C. melodus* breeds, and from observations in 1977, 1978, and 1979 at numerous breeding sites throughout Atlantic Canada.

Adult Piping Plovers were captured on their nests by a drop trap or a circular walk-in trap. Adults were sexed by a combination of behavior and plumage characteristics: in general the male of a pair had the darker neck band. Chicks were banded as they hatched or when first encountered. I banded 14 adults and 53 chicks in 1975, and 11 adults and 91 chicks in 1976. Nineteen adults in 1975 and four in 1976 were color marked. After hatching, chicks were recaptured and weighed as often as possible.

In 1976 I estimated 27-29 pairs of Piping Plovers were present and 96 chicks were hatched on Cadden Beach (based on the number of chicks encountered from known nests compared with numbers encountered from nests not found by me, as well as other circumstantial evidence). Approximately 10 non-breeding birds also occupied the beach each year.

RESULTS AND DISCUSSION

Fidelity to nesting area.—In Nova Scotia most Piping Plovers arrive from mid- to late April and initially feed in areas unclaimed as territories, where aggressive interactions are numerous. Such early-season flocking places birds of both sexes in close proximity, and in high density beaches may speed up the development of behavior associated with territorial es-

establishment and courtship. This is suggested by later hatching dates for beaches where only one or two pairs occur.

At least some birds returned to their territories a second year. Two females caught on Cadden Beach nests in 1976 had occupied the same territories in 1975. Both nested within 20 m of their nest-sites of the previous year. A male occupied a 1976 nesting territory that was about 1 km from his 1975 birthplace. Five other adults already banded when observed on Cadden Beach in 1976 had probably been banded there in 1975 by me.

The tendency for adults to return to a former breeding area (and sometimes nesting territory as well) has been reported for Piping Plovers (Wilcox 1959) as well as for a number of other plover species including Ringed Plover (*C. hiaticula*) (Laven 1940, Bub 1962), Killdeer (*C. vociferus*) (Lenington and Mace 1975), Kentish Plover (*C. a. alexandrinus*) (Rittinghaus 1956), Mountain Plover (*C. montanus*) (Graul 1973b) and Northern Lapwing (*Vanellus vanellus*) (Spencer 1953). Few first year birds return to breed in the area of hatching among *Charadrius* plovers, as suggested by ca. 5% return rates for Ringed, Piping and Kentish plovers (Lenington and Mace 1975).

Spacing and territory size.—Of the approximately 0.2 km² of raised sandspit on Cadden Beach, about 0.12 km² was prime Piping Plover nesting habitat, and was largely divided up into about 28 contiguous nesting territories, ranging from 500–8000 m² and averaging about 4000 m² in size. Feeding territories on the tidal sandflats were defended seaward from stretches of shoreline 50–100 m long. Nesting and feeding territories were usually contiguous, except in densely populated areas where some birds had to cross neighboring nesting territories to reach their feeding territories. Both types of territories were maintained throughout the season by breeding pairs. Unmated males, non-breeding pairs, and pairs that lost a clutch or brood too late to renest also maintained both kinds of territories. Distances to nearest neighboring nests on Cadden Beach averaged 51 m for the 23 nests found in 1975 and 53 m for the 27 nests in 1976 (including three known re-nests). The closest simultaneously active nests were 3 m apart.

Territory sizes among plovers vary greatly ranging from 190 m in Wilson's Plover (*C. wilsonia*) (Tomkins 1944) to 0.16 km² in Mountain Plover (Graul 1973b). Size of territory probably reflects, at least in part, the relative amounts of feeding done within the territory and in areas outside. The Red-capped Dotterel (*C. ruficapillus*) population described by Hobbs (1972) fed at a site 3 km from the breeding grounds, probably an extreme case of distance between feeding and nesting sites. Ringed Plovers (Mason 1947) and Little Ringed Plovers (*C. dubius*) (Simmons 1956) have been reported to feed mainly on neutral feeding areas, while Mountain (Graul

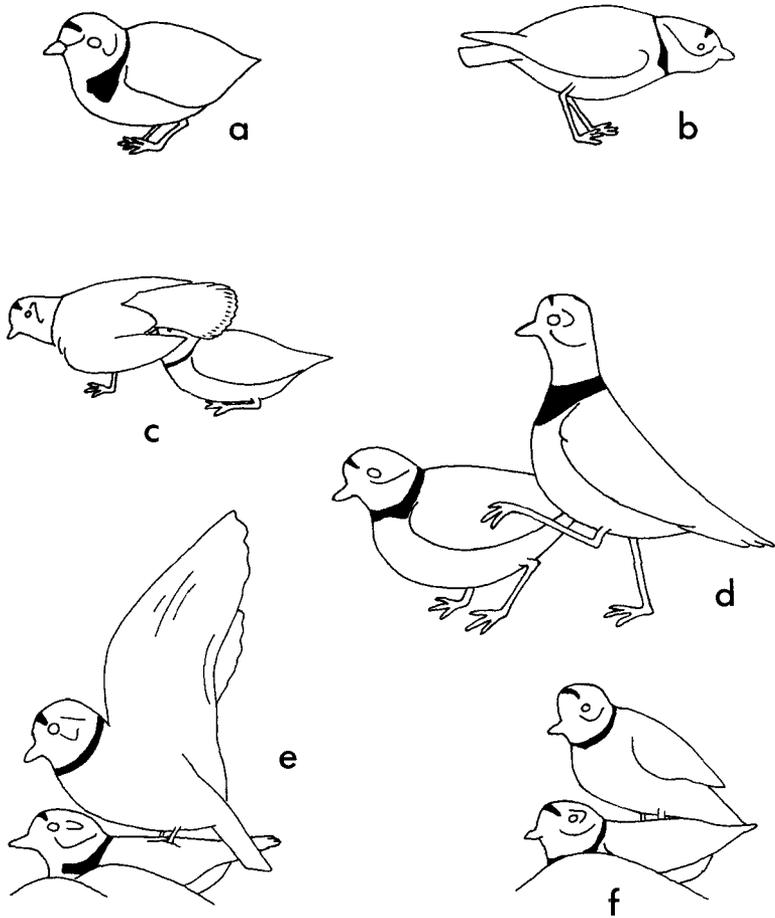


FIG. 1. Courtship postures: (a) territorial male with exaggerated neck band, (b) posture used during low gliding run, (c) female thrusting beak among feathers beneath male's tail, (d) male performing rapid high-stepping tattoo beside female, (e) mounting, and (f) copulation.

1973b) and Piping plovers do most of their feeding within their own territories.

TERRITORIAL BEHAVIOR

Establishment and maintenance.—Upon arrival males begin to establish territories; 8–10 had been set up when observations began on 22 April 1976. During territorial establishment, males spend much time on their prospective nesting territories. Thoroughly traversing the area in brief

flights and runs, they stop periodically and remain motionless except when scanning or preening (Fig. 1a). Scanning occurs at intervals and involves slowly rolling the upwardly tilted head from one side to the other. Most preening, which may last for 2 or 3 h at a time, is concentrated on the neck ring and makes it appear wider and darker. Long periods on the ground are interrupted by aerial displays and calls.

Intruders are met with horizontal threat charges, and ground or aerial chases, which aid in establishing rough territorial boundaries. These may undergo modification throughout the season as parallel run or horizontal threat displays maintain boundaries, or produce gains or losses in territory size. Agonistic activity towards neighboring birds is shown by both sexes although the male plays the greater role, particularly during territorial establishment.

Aerial displays.—Males perform elaborate flights above their territories apparently to advertise ownership to rival males and prospective females. In flight, deep, slow wing-beats and an alternate tilting of the body from side-to-side produce a fluttering flight, making the bird more conspicuous than in normal flight. Display flights, which last up to 30 min, traverse elliptical and figure eight courses from just above ground level up to ca. 35 m.

Aerial displays are usually accompanied by calls. The more common call is a continuous rapid series of high-pitched calls and sometimes is interspersed with a series of long drawn-out mournful-sounding calls.

Aerial displays and calls can arise unprovoked or can be elicited by females or other males. Sometimes two birds perform flying within a few meters of each other: these may be rival males on adjacent territories or, on occasion, mated pairs. Aerial displays and calls are sometimes given on moonlit nights but very rarely on dark nights.

Display flights and calls decline with the onset of egg-laying and incubation. One lone male that failed to attract a mate performed courtship displays regularly from the start of the 1975 field season until 19 July.

The aerial display flight of the Piping Plover resembles that described for Killdeer by Phillips (1972), and Ringed, Little Ringed, and Kentish plovers by Witherby et al. (1965).

Horizontal threat display.—Most horizontal threat displays take the form of a charge. In assuming this display posture the bird leans forward on slightly bent legs with head drawn well back into the body (Fig. 2). The neck ring becomes prominent and with increasing intensity the wings are slightly raised and the feathers of the breast, sides, and upper back are puffed. At greatest intensity the tail is fanned open and depressed, while the feathers of the back, sides, and upper breast are raised to give a ragged appearance. The low intensity display is given within a small flock by one

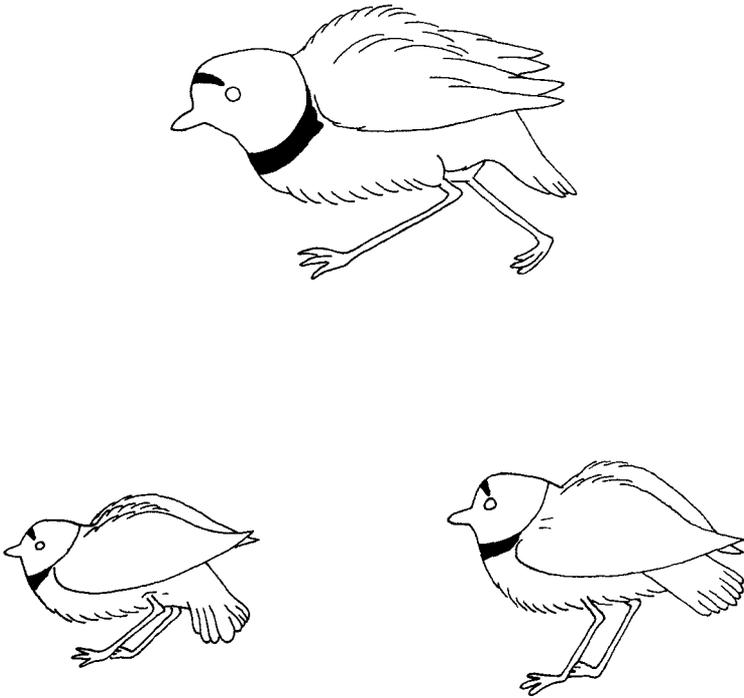


FIG. 2. Some postures used during horizontal threat display.

or more birds using low gliding runs. Then charging birds usually swerve before reaching the target bird and continuously redirect their displays toward other individuals so that actual chases and fights seldom ensue.

Encounters between two individuals more often lead to high intensity display and chases at least 30 m in length. The charging bird adopts a low intensity threat posture in a low gliding run, then increases speed and intensity. At close quarters high intensity charges occasionally terminate in brief fights. The combatants initially face each other in horizontal threat display and then jump and fly at each other, striking the bill and wings against the head, neck, and upper back regions of the opponent. Most skirmishes subsided within a few minutes as the birds gradually moved apart, often vigorously pecking the ground, or running with abrupt stops and starts. Horizontal threat displays were accompanied by a series of low rattling calls which became increasingly more rapid and took on a whirring throaty undertone as the display progressed.

Various forms of the horizontal threat display have been reported for a number of other plover species including Ringed Plover (Edwards et al.

1947, Mason 1947, Simmons 1953b), Semipalmated Plover (*C. semipalmatus*) (Sutton and Parmelee 1955), Little Ringed Plover (Simmons 1953b), Wilson's Plover (Tomkins 1944), Killdeer (Phillips 1972), Mountain Plover (Graul 1973a, 1973b) and Blacksmith Plover (*Hoplopterus armatus*) (Hall 1964). The threat display of the Piping Plover most closely resembles those of the Killdeer and Ringed Plover. These two species enlarge the neck markings and the breast feathers by fluffing them to present a rounded frontal appearance to the protagonist.

Parallel-run display.—After the establishment of territorial boundaries parallel-run displays, in which two neighbors run in parallel along a common boundary, increase in importance. Both birds adopt stiffly erect postures with heads and necks stretched upward, breast feathers puffed smoothly, and dark sides of the neck and neck ring showing sharply against the white (Fig. 3). After facing each other and head-bobbing, one bird turns at right angles and runs rapidly for a distance of 1–10 m along the disputed line. In the same manner the second bird runs past the first, often arcing into its own territory before stopping abruptly ahead of the first bird. The birds move alternately, abruptly terminating each spurt by assuming a more sharply erect posture, and bobbing the head several times.

In more intense encounters running may be interspersed with violent bouts of pecking the ground. Bouts of head-bobbing alternate with very short rapid runs, and a combination of shoulder-to-shoulder and breast-to-breast shoving may occur. Between high intensity parallel runs, close range horizontal threat charges may take place. Low intensity parallel-run displays are expressed by parallel walking or by a form of upright display in which the two opponents face each other and engage in bouts of head-bobbing alternated with neck preening or ground pecking.

The normal parallel run may cover distances of up to 100 m before the birds reverse direction and repeat the display. Encounters may continue 30 min or more, and usually conclude with the gradual withdrawal of both birds, pecking the ground as they move away from the final location of the boundary on that occasion. Vocalizations used during parallel-run displays are similar to those accompanying horizontal threat displays.

Upright threat postures have been reported in Ringed, Little Ringed and Kentish plovers (Simmons 1953b), Killdeer (Phillips 1972), Wilson's Plover (Tomkins 1944) and Mountain Plover (Graul 1973b), but only Killdeer and Mountain Plover are known to use the displays in conjunction with parallel runs. Interestingly, Ringed and Little Ringed plovers, when in upright threat display rapidly run in place, in a manner similar to the pre-mounting behavior of the Piping Plover. The general pattern among plover species of a head-up posture for defense threat and head-down posture for aggressive threat (Maclean 1972) also holds true for Piping Plovers.

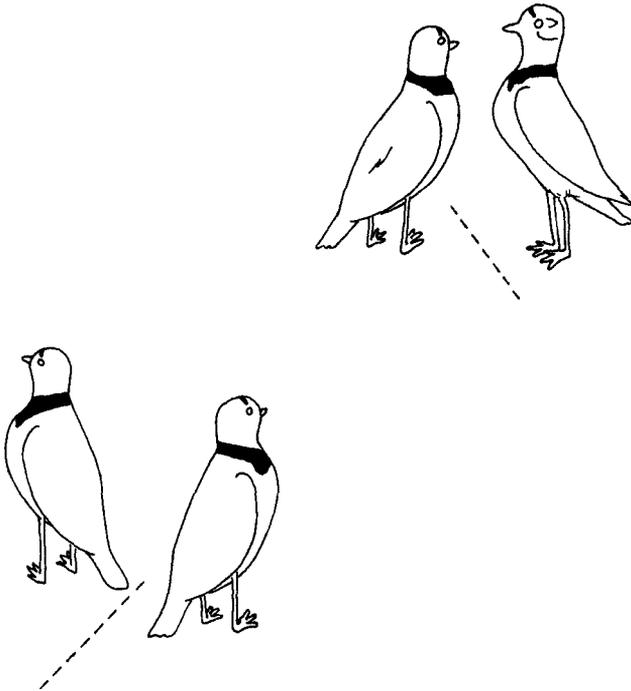


FIG. 3. Upright postures used during parallel-run displays along a common boundary.

COURTSHIP

Scraping.—A courting male on territory walks about with deliberate movements, often tossing aside sea shell fragments. Periodically he stops, squats, and, leaning far forward on his breast, pivots to the left and right, while simultaneously kicking sand backwards, producing a shallow depression or scrape in the sand. During pauses he occasionally utters one or both advertisement calls, or tosses bits of shell from the rim of the scrape into the depression beneath him. When a female is nearby the male walks or runs on bent legs, with head lowered and tail sometimes spread and elevated, squatting briefly in a number of his scrapes, of which there may be 20 or more (Fig. 1b). If the female approaches closely, the scraping male erects and spreads his tail, and increases the tempo of rotations in the scrape. Occasionally, a female following a courting male will also scrape briefly.

Tilt display.—With the female close by, the male may perform a tilt display, slowly rising to stand stiffly upright in the scrape, head, body, tail, and the partly or completely spread wings all being held in one plane, with tail elevated at an angle of about 30° (Fig. 1c). The female crouches

slightly behind the male and thrusts her beak one or more times among the feathers below the base of his tail. Alternatively, the female may approach from the side, and creeping under the male's horizontally spread tail, nestle into the sand beneath it, her body perpendicular to his. The tilt display may be repeated several times in succession at different scrapes, or the female may walk a short distance away, adopting a slightly crouched stance with legs somewhat spread, and await the approach of the male.

Mounting and copulation.—Advancing toward the female, the male slips into a low gliding crouch with head held below the horizontal and drawn well into the body. Nearing her, he gradually rises into a very erect posture with neck outstretched, neck ring conspicuously broadened and breast expanded. Simultaneously he beats a high-stepping and increasingly rapid tattoo with both feet (Fig. 1d). Upon reaching the female the male may stand by the base of her tail and continue the tattoo for a few minutes longer before flapping his wings and mounting (Fig. 1e). Copulation takes up to 1.5 min. Both birds often preen after copulation. No post-copulatory displays were seen.

Courtship in the Piping Plover basically resembles that of *Charadrius* spp. as demonstrated by Little Ringed Plover (Sluiters 1938, Simmons 1953a), Ringed Plover (Laven 1940), Snowy Plover (*C. a. nivosus*) (Boyd 1972), Mountain Plover (Graul 1973b), and Killdeer (Phillips 1972). However, none of these authors mentioned the female thrusting her bill among the feathers beneath the male's tail, as indicated above in the Piping Plover. Other differences between *C. melodus* and *Charadrius* spp. occur in the position of the wings during the tilt display; both Little Ringed (Glutz et al. 1975) and Piping plovers spread their wings on a uniform plane, while the Snowy and Mountain plovers droop the wing which is toward the female. The Killdeer apparently does not spread its wings.

The details of mounting and copulation differ somewhat with plover species. In most, males approach females in a low gliding run which somewhat resembles the posture used during low intensity horizontal threat. Before actually mounting the female, male Snowy Plovers (Boyd 1972), Red-capped Dotterels (Hobbs 1972), Killdeer (Phillips 1972), and Mountain (Graul 1973b) and Wilson's plovers (Tomkins 1944), as well as Piping Plovers adopt an upright precopulatory posture with rapid high-stepping foot movements. The Snowy (Boyd 1972) and Wilson's plovers (Tomkins 1944) are apparently the only species in which males grasp the female's neck feathers with their bills during copulation. Piping Plovers copulate anywhere within their nesting and feeding territories but Snowy Plovers (Boyd 1972), Killdeer (Phillips 1972), and Mountain Plovers (Graul 1973b) apparently only copulate at nest or scrape sites.

DISTRACTION BEHAVIOR

Piping Plovers respond to intruders (avian, human, and other mammalian) by squatting, false brooding, high-tailed running, crouch run, and injury feigning. During highest intensity distraction constant "whirring" vocalizations may be emitted. Some displaying birds have come within 2 m of me while others, after initially approaching me, have been observed to feign injury continuously while travelling up to 100 m away. Distraction display may occur at any time during the breeding season, although it is usually most frequent and intense about the time of hatching. Both birds of a pair may simultaneously engage in distraction displays, especially in areas of high density of nests or broods, when as many as a dozen adults may converge on an intruder. In isolated pairs, one bird may take charge of leading the young to safety while the other displays toward the intruder.

NESTING

Nests.—Of 86 nests, 69 were on raised sandspits with little or no slope, the remainder on the lower slopes of dunes. Small stones (1–12 cm diameter) were scattered around 31 of 38 nests. Of these, "nearest object" (disregarding vegetation, which would be absent or tiny when nests were initiated) was <0.5 m from one nest and >6 m from 31 nests. In general, nests were not near vegetation on broad beaches but on narrow beaches (as little as 2 m wide) they were sometimes under tufts of marram grass. On extensive tracts of open beach habitat the birds had a wide field of view, and on average left their nests when intruders were 43.1 ± 21.2 m away ($N = 66$, range = 5–93 m). Choice of nest-site in Piping Plovers, in contrast to other Charadrii (Graul 1975), is not tied to proximity of vegetation or physiographic features.

Some Piping Plover nests are lined with fragments of sea shell, accumulated during courtship and incubation. Nests on sand or a sand-gravel surface are unlined, whereas nests on beaches strewn with broken shells are usually lined to some extent. A lining of bleached sea shells increases nest visibility from above, but probably does not aid adults in finding nests, since they normally approach the nest-site on foot. White shell linings are particularly conspicuous in wet weather when the sand color darkens. Three clutches disappeared (lost to predators) from lined nests during heavy rain.

Lining the nest is widespread among plovers. In Red-capped Dotterels the amount of nesting material depends on dampness of the site (Hobbs 1972). Improved drainage due to lining may not be critical to nesting success in Piping Plovers as three watersoaked clutches hatched successfully, suggesting considerable tolerance to moisture.

Egg-laying.—Established pairs court and copulate repeatedly before and during the egg-laying period. Scrapes appeared in territories up to 2 weeks before females selected scrapes and laid first eggs. Copulation and other associated displays fall off rapidly after the clutch is completed, although pair bonds are maintained.

In two cases clutches were completed in 6 days and in one case in 5 days. Intervals between successive eggs ranged from 44–54 h in seven instances, but two intervals were 72 h and 77 h each. These values agree with Wilcox (1959), who reported eggs laid on alternate days, with the clutch completed in 6 days.

Eggs.—The pale buff eggs are marked with fine splotches of black, brownish-black or purplish-black. Markings are usually distributed quite evenly, but some eggs have more, larger, and darker spotting at the broad end. Within clutches intensity and size of markings are usually quite similar.

For 215 eggs from 56 clutches, mean length was 32.5 ± 0.955 mm (range = 29.6–35.4) and mean breadth was 24.8 ± 0.5 mm (range = 23.4–26.1). The mean index of egg volume (length \times breadth²) was $19,927 \pm 1054.3$ mm³ (range = 16,486–22,387). A one-way analysis of variance performed on dimensions of the 16 eggs from six clutches whose order of laying in the clutch was known, showed no significant differences ($P \leq 0.05$) among the four clutch positions. However, highly significant differences ($P \leq 0.01$) in dimensions were found among the clutches of individual females.

Piping Plovers raise one brood per year. Mean clutch-size was 3.96 ± 0.2 ($N = 68$, range = 3–4). Clutches laid later in the breeding season are often smaller and Tufts (1973) suggested that Piping Plovers in Nova Scotia tend to lay fewer eggs in second clutches. The only three 3-egg clutches found were all first clutches.

Incubation.—During the daytime both sexes incubate, probably about equally. In 12.1 h of observations at two nests, females incubated 6.1 h and males 6.0 h. Nest relief involves elements of display and predator distraction. A bird involved in exchanging incubation duties with its mate announces its arrival with one or two notes. The sitting bird usually responds vocally and sometimes also tosses to either side shell fragments from the edge of the nest. The approaching bird always walks to the nest, occasionally shell-tossing. Preferred directions and routes for approaching and leaving are indicated by tracks. At the mate's approach the incubating bird walks from the nest; it too may shell-toss and preen briefly. When being relieved male birds sometimes move away in a low crouched walk similar to the low gliding run of courtship. The relieving bird settles immediately onto the eggs uttering soft throaty peeps. If the departing bird

leaves the territory one or two single peep notes or "peep-low" calls may be given. If the off-duty bird remains it usually squats on the sand some distance from the nest (often at regular sites) closely resembling an incubating bird. Mean time of daytime incubation bouts was 79.4 ± 47.3 min ($N = 17$, range = 25–153).

When untended nests are filled in with sand, adults use rapid shuffling foot movements to search for eggs, and kick sand away to uncover them. In contrast, Killdeer (Nickell 1943), and Little Ringed and Kentish plovers (Walters 1956) use the bill to locate and uncover buried eggs.

Hatching.—The incubation period (considered here to be time from laying of last egg until hatching of last egg) was 28 days for five clutches, 27 days in one clutch and 29 in another. Two clutches in nests 3 m apart took minimally 31 and 38 days to hatch, because of the greater than normal time devoted to territorial interaction between these adjacent pairs.

Protracted incubation periods for European Oystercatchers (*Haematopus ostralegus*) have been attributed to time adults were kept off the nest by human disturbance (Keighley and Buxton 1948). A case of prolonged incubation period in the Spotted Sandpiper (*Actitis macularia*) (Hays 1972) was attributed to a delay in initiation of steady incubation due to the too close proximity of another nest.

One mateless female Piping Plover incubated her four eggs for a minimum of 39 days before deserting. In contrast, Boyd (1972) and Rittinghaus (1956) reported that widowed female Snowy and Kentish plovers deserted within 4–6 days after the disappearance of a mate.

There was no indication within clutches that eggs laid earlier hatched sooner; most hatched within 4–8 h. However, in a few clutches the hatching period lasted up to 45 h, usually involving delay of only one egg. Eggs failing to hatch were abandoned within 1–2 days. Egg shells are carried on foot up to 40 m from the nest; one bird flew with the shell after walking 10 m.

In 1975, peak hatching occurred during the second and third weeks of June. Probably a number of late June and July hatchings are re-nests. My observations in 1977, 1978, and 1979 showed peak hatching periods during the third and fourth weeks of June on beaches in New Brunswick, Prince Edward Island, and the Magdalen Islands, where delayed nesting may be related to a longer migration route and the later spring in the Gulf of St. Lawrence. Latest known hatching occurred about 27 July 1977, at Cavendish, P.E.I. The one known nest of a first year bird, a male, contained eggs that hatched 6–8 July 1976.

Out of 25 nests checked on Cadden Beach in 1975, 77 young hatched from 97 eggs, a 79.4% hatching success. Average number of young hatch-

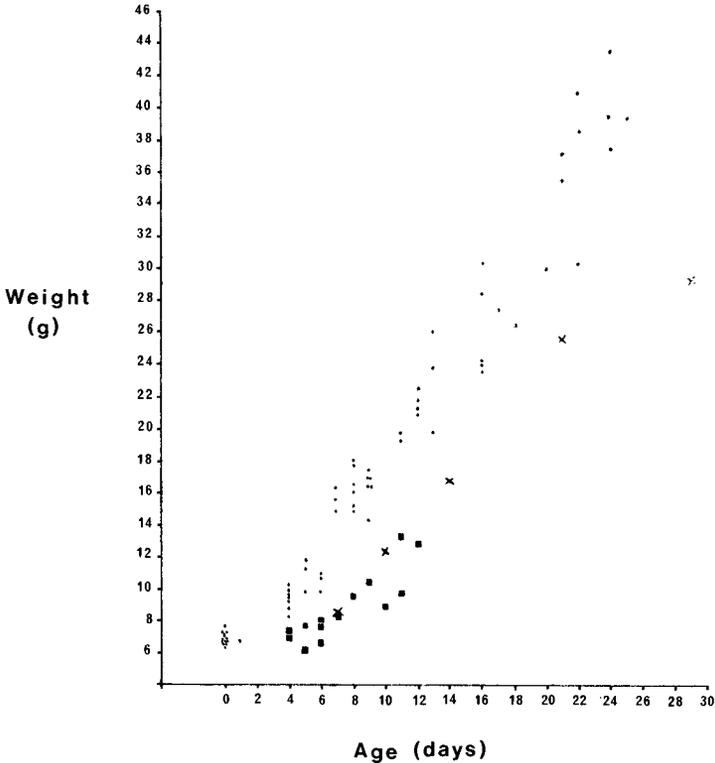


FIG. 4. Weight development of chicks. Dots denote chicks believed to have fledged, squares denote chicks dying before 14 days, and x's indicate values (sample size not reported) given by Wilcox (1959).

ing per nest was 3.08. In 1976, 104 eggs were found in 26 nests of which 75 hatched for a success rate of 72.1% or an average of 2.88 chicks hatched per nest. Of the 49 of 201 eggs which failed to hatch nine were damaged during handling or trapping; 17 were destroyed by mammals or birds (cattle, and probably gulls [*Larus*] or crows [*Corvus*]); and 23 were abandoned in the nest. Wilcox (1959) found somewhat higher success among Long Island Piping Plovers over a 20-year period: 91% hatching, an average of 3.52 young per nest.

Young.—Fig. 4 presents weight development of chicks. Chicks which fail to achieve about 60% of normal weight by day 12 are unlikely to survive. Wilcox (1959) reported chick weights somewhat lower than those obtained on Cadden Beach. Cadden Beach chicks having growth incre-

TABLE 1
 PIPING PLOVERS FLOCKING WITH OTHER SPECIES PRIOR TO MIGRATION

	Piping Plovers	Other species (N)	Activity
11 July '75	3 adults	'peep' (112)	feeding
14 July '76	27 adults 7 juv.	Least Sandpiper (110)	feeding
15 July '76	12	Least Sandpiper (65)	flying, calling
22 July '76	16	Least Sandpiper (50)	flying, calling
	4	Least Sandpiper (4)	flying, calling
23 July '76	3 adults	Sanderling (3)	feeding
	1 juv.	Semipalmated Sandpiper (2) Least Sandpiper (1)	

ments during their first 10 days as low as those reported by Wilcox (1959) without exception failed to survive.

Two chicks 25 days old could fly >15 m, while two others could fly <2 m. Young of two broods aged 28 and 32 days were flying well. These fledging times are somewhat shorter than the 30–35 days reported by Wilcox (1959).

Fledging success is difficult to assess since older chicks become increasingly elusive. I considered that a chick survived to fledging if when last caught it was known or estimated to be at least 10 days old and exhibited a normal growth pattern at the time (see Fig. 4). The fate of 75 chicks hatching from known nests has been assessed as follows: 29 presumed dead, 28 presumed fledged, and 18 unknown. In addition, at least 11 chicks from nests that were not found are believed to have fledged. Thus, between 39 and 57 chicks may have fledged from Cadden Beach in 1976. This represents approximately 1.3–2.1 chicks fledged per pair. On eight smaller, accessible, recreational beaches 15 pairs fledged between 11 and 17 young or 0.7–1.1 young fledged per pair.

Data on fledging success in other plover species are scarce. For the Ringed Plover fledging rates of one chick per pair (Laven 1940) and 1.28 chicks per pair (Prater 1974) have been reported. Boyd (1962) gave 1.55–2.22 young fledged per pair in Little Ringed Plover and Graul (1975) cited a ratio of one juvenile to three adults in pre-migration flocks of Mountain Plover.

Flocking and departure.—By early July some adults and the oldest of the fledged juveniles increasingly flock on neutral feeding areas and associate with other migrants such as Least Sandpiper (*Calidris minutilla*),

Greater Yellowlegs (*Tringa melanoleucus*), Sanderling (*Calidris alba*), Semipalmated Plover and Spotted Sandpiper (see Table I). Migrating Piping Plovers often give two-note calls while in flight.

SUMMARY

A population of approximately 27–29 pairs of Piping Plovers (*Charadrius melodus*) was studied in southern Nova Scotia in 1975 and 1976. Birds arrived in late April, occupied nesting and feeding territories, and initiated courtship. The aerial display flight of males is similar to that of several other plover species and is used to advertise territorial possession and attract prospective mates. Horizontal threat charges, and ground or aerial chases are used in the establishment of territorial boundaries. Parallel-run displays are more frequently used for boundary maintenance. Scraping, tilt display, and copulatory and distraction behaviors are generally similar to those of other *Charadrius* spp. Mean size of nesting territories was 4000 m² and nests averaged about 52 m apart. Of 68 clutches 65 had four eggs and three had three eggs. Most eggs were laid at approximately 48-h intervals; the longest interval was 77 h. Incubation averaged 28 days; one extreme of 38 days was recorded. Egg size varied significantly among females but not with order of laying. Average number of young hatching per nest was 3.08 in 1975 and 2.88 in 1976. Growth rates for most chicks were higher than those reported for birds in New York.

ACKNOWLEDGMENTS

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BIOLOGY DEPT., DALHOUSIE UNIV., HALIFAX, NOVA SCOTIA B3H 4J1, CANADA. (PRESENT ADDRESS: 60 NEWLAND CRES., CHARLOTTETOWN, PRINCE EDWARD ISLAND C1A 4H7, CANADA.) ACCEPTED 22 APR. 1982.

Common Mammalian and Avian Predator Tracks

						   
<p>Walking track of Coyote Actual Size: FF: 1 3/4" x 2 1/2" HF: 1 1/2" x 2 1/4" Stride: 14"</p>	<p>Walking track of Red fox Actual Size: FF: 2" x 2 1/2" HF: 1 3/4" x 2" Stride: 8" to 18"</p>	<p>Walking track of House cat Actual Size: FF: 1 1/8" x 1 1/8" HF: 1 1/8" x 1 1/8" Stride: 6"</p>	<p>Walking track of Striped skunk Actual Size: FF: 1 1/2" x 2" HF: 1 1/2" x 2 1/2" Stride: 5"</p>	<p>Walking track of Raccoon Actual Size: FF: 2 1/2" x 3" HF: 2 1/2" x 4" Stride: 7"</p>	<p>Walking track of Opossum Actual Size: FF: 1 3/4" x 1 1/2" HF: 1 1/4" x 1 3/4" Stride: 12"</p>	<p>Great Horned Owl Actual Size: 2 1/2" long</p> <p>Crow Actual Size: 3" long</p> <p>Black-Crowned Night-Heron Actual Size: 4" long</p> <p>Herring Gull Actual Size: 3 1/2" long</p>

Appendix Three

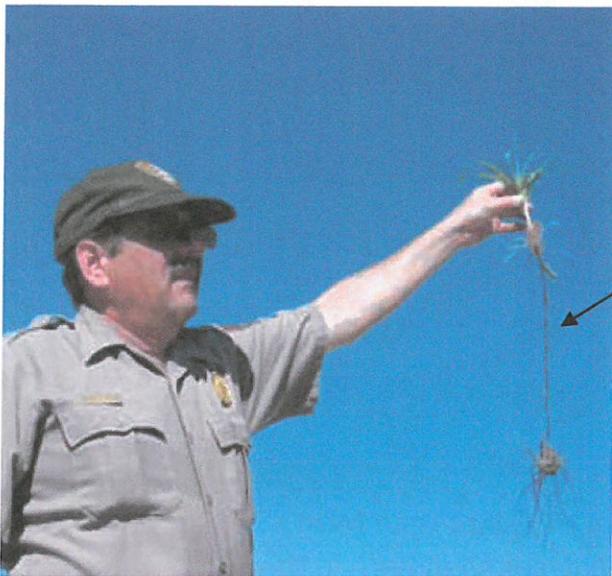
Invasive Coastal Plant ID Sheets & Survey Form
TESS fact sheet
Tiger Beetle ID sheet

Desparately Seeking Sand Sedge!

Asiatic Sand Sedge, *Carex kobomugi*, is an exotic sedge that can grow on ocean beaches in large clones and crowd out all other vegetation and animals including rare and endangered species. Become familiar with its characteristics and look for it when you are on the beaches of the south shore of Long Island and Staten Island. Report any finds to liismaprism@gmail.com.

The plants are short and have stiff arched leaves that are scabrous on the edges so they scratch your fingers if you run them up and down the leaf.

The base of the plants are white. This plant has long roots but no rhizome yet so it can be safely pulled.



Long rhizomes connecting some plants can break when dug up and start new plants. The growing ends of the rhizomes are very sharp and can pierce a bare foot.

The flowering spike is on a separate stalk from the leaf stem and comes up beside it at the surface of the sand. They are very large for a *Carex* species and have stiff brown bracts.



Some species of flatsedge, *Cyperus*, may look like sand sedge but the leaves are not as arched over and they are smooth, not rough, on the edges. Run your hand up and down the leaves to confirm.



Once it gets going for a few years the plants can form a large and dense clon over the beach as seen here in the Rockaways with taller beach goldenrod.

Carolinas Beach Vitex Task Force

In 2003, a workshop on beach vitex was hosted by the North Inlet-Winyah Bay National Estuarine Research Reserve in Georgetown, SC. This workshop brought together private citizens, personnel from different state and Federal agencies, and representatives from non-profit organizations, resulting in the formation of the South Carolina Beach Vitex Task Force. In 2005, North Carolina joined the effort and the name was changed to the Carolinas Beach Vitex Task Force. The objectives of the Task Force are to:

1. Detect and map beach vitex populations in coastal South Carolina and North Carolina.
2. Remove seedlings from public areas to prevent further spread.
3. Conduct an ecological assessment to determine beach vitex's impact on native plants and animals.
4. Research environmentally sound methods for removal.
5. Restore affected areas with native plants.
6. Educate homeowners, landscapers, and the general public about beach vitex.



What can you do to help?

1. *Don't plant beach vitex.* Contact The Carolinas Beach Vitex Task Force for a list of beneficial native plants that can be used in landscaping.
2. *Attend a native plant training session sponsored by the Carolinas Beach Vitex Task Force.* Learn how to identify beach vitex and how to distinguish this plant from native plants.
3. *Notify the Task Force of any potential beach vitex you may find.* Don't try to do any removal yourself. The Task Force is mapping all locations in an effort to monitor this plant. Take note of where you have seen beach vitex and contact the Task Force.
4. *Volunteer!!* The Task Force needs volunteers to monitor our beaches and to help with projects. Get involved!!

Carolinas Beach Vitex Task Force Partners:

BASF Corporation
Clemson University
North Inlet-Winyah Bay National Estuarine Research Reserve
- University of South Carolina
Natural Resources Conservation Service
North Carolina Cooperative Extension Service
North Carolina and South Carolina Sea Turtle Networks
Town of Pawleys Island
Gaylord and Dorothy Donnelley Foundation
SC Department of Health and Environmental Control -
Office of Ocean and Coastal Resource Management
SC Department of Natural Resources
SC Department of Parks, Recreation and Tourism
SC Native Plant Society
US Army Corps of Engineers
US Fish and Wildlife Service
US Geological Survey



For more information and to report any suspected beach vitex locations, please contact:

Betsy Brabson, SC BV Task Force Coordinator
(843)546-9531
wbrabson@sccoast.net

Melanie Doyle, NC BV Task Force Coordinator
(910)458-8257 ext. 250
melanie.doyle@ncmail.net

Randy Westbrook, U.S. Geological Survey
(910)640-6435
rwestbrooks@usgs.gov

or visit the website at:

<http://www.beachvitex.org>

Beach Vitex : Carolinas Newest Coastal Menace





**Beach vitex:
growing season**

Beach Vitex (*Vitex rotundifolia*)

A deciduous woody vine native to Korea and other countries in the western Pacific, this plant was introduced to the Southeastern United States in the mid-1980's for use as an ornamental and also for beach stabilization. By the mid-1990's, plant specialists began to notice beach vitex spreading from original plantings on North Carolina and South Carolina beaches, crowding out native dune plants and altering sea turtle nesting areas.



**Beach vitex:
fall foliage**

Identification

Beach vitex leaves are round, silvery gray-green, 1-2 inches long, and have a spicy fragrance. The flowers are purplish-blue, 1 inch in width, and produce small clusters at the ends of branches. The round fruits are 1/4 inch in diameter and purplish-black when ripe. Growing at a rate of 10 feet or more per year, the plant typically grows up to 12 feet in diameter and can produce runners up to 60 feet long.



Good Plants...Bad Plants

Invasive species affect each of our lives, all regions of the U.S., and every nation in the world. One report indicates that the economic cost of invasive species to Americans is an estimated \$137 billion every year. Not only are there economic costs, but invasive species are costing the lives of our precious natural resources. Up to 46% of the plants and animals that are Federally listed as endangered have been negatively impacted by invasive species. Beach vitex joins an ever-growing list of invasive threats.

Besides being drought tolerant, salt tolerant, and fast-growing, beach vitex is a prolific seed producer. Seed production can be as high as 10,000 to 20,000 seeds per square meter. Seeds and other plant parts that are dispersed via animals, wind, or water easily colonize other areas besides the beaches. Beach vitex has recently been documented growing in salt marshes.



Sea Turtle Impacts

Beach vitex on the beaches of South Carolina and North Carolina is altering sea turtle nesting areas and is also costing the lives of newly emerged sea turtle hatchlings. Hatchlings become trapped in the thick tangle of vegetation, exhausting themselves and perishing before reaching the ocean.



Impacts on Native Vegetation

In areas where beach vitex has been found, native plants are being choked out. Sea oats, beach panic grasses and the Federally threatened seabeach amaranth cannot out-compete the fast growing beach vitex.



Seabeach amaranth

Beach Stabilization

A plant introduced to help stabilize our beaches is instead proving just the opposite. Beach vitex lacks the fibrous root system like the native plants of our beaches and thus, lacks the ability to trap sand adequately. As beach vitex dies back each winter, the root systems can be found exposed where the beach has literally eroded from underneath the plant, further jeopardizing our beaches.

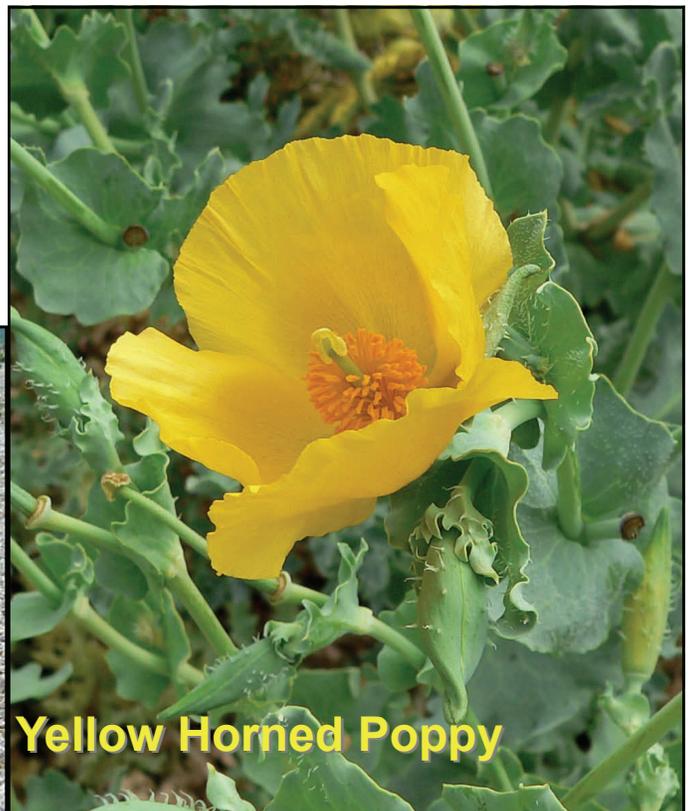




Invasive Species on Long Island's Beaches & Dunes

If found, please gather a sample and deliver it to Alex Entrup at the TNC Uplands office.

aentrup@tnc.org 631-367-3384 x154



LIISMA/TNC Coastal Invasive Plant Report Form

Species Identified _____

Name _____

Telephone # or E-Mail _____ **Date observed** ___/___/___

State: NY **County:** _____ **Town:** _____

Location (please check one of the boxes AND identify specifically as possible the area you've located the weed, name of park, name of street or cross streets, any identifying landmarks in the area, etc.)

- Beach
- Dune
- Tidal Wetland
- Roadside
- Yard/Garden
- Trailside
- Other (describe below)

Directions to this Location

Distribution (check one)

- Spotty
- Light
- Dense
- Dense Pockets

Abundance (check one)

- Single plant
- <20
- 20-99
- 100-999
- >1000

TOTAL ESTIMATED AREA INFESTED BY WEED _____

Comments: _____

Within 7 days of your report, please mail or drop off a fresh (in a plastic bag, **WELL** taped shut!) or pressed specimen of plant with this report form to the address listed below.

Attach a map, photo or sketch of the pattern of infestation (if applicable) and please e-mail digital photo (500KB or less only!) to jjanssen@tnc.org.

Joe Janssen
The Nature Conservancy on Long Island
250 Lawrence Hill Road
Cold Spring Harbor, NY 11724

Or E-Mail completed form and digital photos to
jjanssen@tnc.org (remember, 500 KB or smaller only!)

Yellow Hornpoppy *Glaucium flavum*



Photo: B. Horwith at Accobonac Harbor



Alien: Native of Europe.

Identification: The flower is yellow, large (over 2 inches in diameter), with 4 petals. Seed-pod extremely long and curved. Leaves gray-green, deeply cut, the upper leaves clasping the stem. Plant 2 to 3 feet in height.

Distribution: Southeastern Canada and into the northeastern United States from Michigan and New York to Virginia.

Habitat: Horn Poppy is a weed found primarily in coastal areas.

Flowering period: June to August.

Similar Species: The large flowers, upper clasping leaves, and elongate, curved seedpod are distinctive for Horn Poppy.

<http://www.nearctica.com/flowers/papaver/Gflavum.htm>

Three photos above: IPANE—S. Leight

Carex kobomugi
Japanese sedge
Asiatic sand sedge

Compiled by Suzanne Simone, Environmental Planner for the Town of Cheshire, from resources available on the Invasive Plant Atlas of New England (www.ipane.org), USDA Plants Database (<http://plants.usda.gov>) and Georgia Court University (http://gcuonline.georgian.edu/wootton_1/Carexkobomugi.htm) websites.

HISTORY

As the common name indicates, *Carex kobomugi* was introduced to North America from its native Japan, China and Korea. The first account of introduction to the United States was recorded in 1928 at Island Beach State Park, New Jersey. It is believed that the initial introduction was from plants used as packing material in cargo shipments from Asia. In the 1960s and 1970s this species was initially propagated and deliberately planted as a dune stabilizer. In the 1990s this plant was recognized as a non-native invasive, by which time populations of this species were recorded in Massachusetts, Rhode Island, New Jersey, Virginia, Delaware, Maryland, North Carolina and Oregon.

IDENTIFICATION

Carex kobomugi is adapted to the high concentration of salt and wind along the coast and sand dunes, and therefore thrives in the shoreline environment. This perennial sedge grows to a height of 4"-12" in densely packed communities. The slightly arching leaves are very stiff and measure 3-6 mm (0.1-0.25 in.) in width. Feeling the small ridge like serrations along the outer edges of the leaves easily identifies *Carex kobomugi*. These ridges are visible under a 10x hand lens. The color ranges from bright green to yellowish green, with yellow and brown leaves being more common in the spring and fall.



<http://www.lib.uconn.edu/webapps/ipane/browsing.cfm?descriptionid=121>



http://gcuonline.georgian.edu/wootton_1/carexcharacteristics.htm

REPRODUCTION

Although this species is dioecious and produces separate male and female flowers in May and June, reproduction is conducted primarily through spear-shaped rhizomes. *Carex kobomugi* has the ability to form dense stands on coastal dunes and has been found in densities of up to 200 plants per square meter.

INVASIVE STATUS

According to the USDA PLANTS database, only two states, Connecticut and Massachusetts have passed legislation limiting the commercial availability of this

species. The April 20, 2005 Connecticut Invasive Plants Council's invasive plant list identifies *Carex kobomugi* as potentially invasive and banned from sale in Connecticut.

HABITATS IN NEW ENGLAND

Coastal beach or dune.

Carex kobomugi is found on the upper dunes of sandy beaches, and in sand pits near the coast.

NATIVE SPECIES

The following native plants can be successfully used for sand dune stabilization without the negative impacts associated with the monoculture of *Carex kobomugi*.

Ammophila breviligulata Fern. (American beachgrass). *Ammophila breviligulata* has dense inflorescences that measure 10-40 cm (4-15 in.) long and 1-2.5 cm (0.4-1 in.) wide, and its leaves are 2-ranked.

Panicum amarum Elliott (bitter panicum). *Panicum amarum* is glaucous and also has 2-ranked leaves.

SOURCES

<http://www.lib.uconn.edu>

http://gcuonline.georgian.edu/wootton_1/Carexkobomugi.htm

<http://plants.usda.gov/java/nameSearch?keywordquery=carex+kobomugi&mode=sciname&submit.x=20&submit.y=9>



Perennial Pepperweed

Lepidium latifolium L.

Mustard family (Brassicaceae)

NATIVE RANGE

Southeastern Europe and southwestern Asia

DESCRIPTION

Perennial pepperweed (synonym: *Cardaria latifolia* (L.) Spach), is also known as tall whitetop, giant whiteweed, perennial peppergrass, slender perennial peppergrass, broadleaf or broadleaved pepperweed, ironweed and other names. Plants are multiple stemmed and grow in stiffly erect masses up to 5 ft. (1.5 m.) tall, sometimes taller. Leaves are lanceolate, bright green to gray green, and entire or toothed. Basal leaves are stalked, up to 1 ft. (30 cm) long and 3 in. (8 cm.) wide and have serrate margins. Stem leaves are smaller, ranging from 3-10 in (7-25 cm) in length, tapered at the base, entire to weakly serrate and are sessile to stalked. Flowering occurs from early summer to fall. Abundant small white 4-petaled flowers are borne in dense clusters near the stem tips. The fruits are small, flattened pods about 1/10th inch long, each containing 2 seeds (1 per chamber). Fruits remain on the plant, dropping irregularly throughout the winter. The base of the stem is semi-woody. The roots enlarge at the soil line, forming a woody crown. Root length is dependent on soil tilth, but can be up to 6 feet. Roots are creeping, with new plants springing from root sections as small as 2 inches. Seedlings, when present, have leaves that are ovate to oblong, 1/4-1/2 inch long, with smooth to slightly wavy edges and a petiole approximately 1/5th inch long. Subsequent leaves resemble first leaves, but are larger in size.



ECOLOGICAL THREAT

Perennial pepperweed is a highly invasive herbaceous perennial. It can invade a wide range of habitats including riparian areas, wetlands, marshes, and floodplains. It adapts readily to natural and disturbed wetlands. As it establishes and expands, the plants create large monospecific stands that displace native plants and animals. In addition to impacting alfalfa and pasture production, it has been reported to adversely affect food quality and nesting habitat for native birds and threaten the Carson's Wandering Skipper butterfly. Most of the reports of habitat and food quality are anecdotal.



DISTRIBUTION IN THE UNITED STATES

Infestations have been reported in coastal, intermountain and mountainous areas in New England, all the states west of the Rocky Mountains, except Arizona. It also occurs in Canada and Mexico.

HABITAT IN THE UNITED STATES

Perennial pepperweed occurs in riparian (stream) areas, coastal wetlands, marshes, roadsides, railways, ditches, hay meadows, pastures, cropland, and waste places.

BACKGROUND

Pepperweed probably entered the U.S. prior to 1940 in a shipment of beet seed (*Beta vulgaris*) from Europe.

BIOLOGY & SPREAD

Perennial pepperweed rarely produces seedlings in the field. There is no known reason for this, as laboratory tests have shown seed viabilities to be high. Seeds lack a hard seed coat and lose viability rapidly, suggesting that resurgence of a treated infestation from the seed bank would be low. The plant mainly propagates clonally from its brittle rhizome-like roots. Roots exposed by washouts and land disturbances fragment and move along riparian corridors to start new

infestations downstream. Roots fragmented by the mechanical actions of land management practices increase infestation densities and facilitate spread.

MANAGEMENT OPTIONS

Deep-seated rootstocks make pepperweed difficult to control. With the exception of continual flooding, no non-chemical treatments have been found to effectively control this weed as a sole control option. Excellent control can be obtained with a combination of herbicides and cultural practices which fit in various control strategies, but application of the control plan must be repeated numerous times to obtain lasting management. Slow recovery of desirable plants is often an issue when combating pepperweed. Revegetation with desirable species may be necessary to restore the landscape.

Perennial roots can also remain dormant in the soil for several years, thus intense early detection monitoring and removal are the best control measures for perennial pepperweed. Sources of infestations should also be located and eliminated to prevent future infestations.



Treating pepperweed with herbicides at a non-optimal time of year (e.g. other than at flower bud) is ineffective, as the roots, where carbohydrates are stored, are not affected by the spray and new plants will rapidly resprout.



The most effective control regimes are:

- Spring grazing with subsequent chlorsulfuron or imazapyr application at flower bud
- Spring mowing with subsequent chlorsulfuron or imazapyr application at flower bud
- Glyphosate alone at flower bud when populations are not dense
- Spring mowing followed by glyphosate at bud stage in wetland areas

Chemical

Foliar application

Only foliar application methods have been shown to be effective. A list of herbicides, sites where the compound has been approved for use, restrictions, and effectiveness is included in the table. For rates and other important information, see the herbicide label.

Herbicide	Site	Restrictions	Effectiveness
Telar® (chlorsulfuron)	Noncrop, Industrial	Selective herbicide (will not harm most grasses), do not apply near water.	Excellent control for 1-2 years
Habitat® (imazapyr) Stalker® (imazapyr)	Riparian, Wetlands Wildlands	Nonselective herbicide, do not apply near water.	Excellent control for 1-2 years. Treated areas typically remain void of any vegetation for 1-2 years after treatment.
Roundup® and others (glyphosate) Rodeo®, Aquamaster® and others (glyphosate)	Wildlands Aquatic	Nonselective herbicide. Rodeo for areas near/in aquatic sites.	Effective unless infestation is dense. If dense, mow area and apply to resprouting plants.
Weedar 64® (2,4-D)	Wildlands, Aquatic	Selective herbicide (will not harm grasses)	Somewhat effective unless infestation is dense. If dense, mow area and apply to resprouting plants.

Manual and Mechanical

Mechanical control options are typically not effective. Very small patches can be controlled by hand removal if the process is repeated often for several years and plants are not allowed to mature. Because root systems are brittle and can extend so deep in the soil most mechanical techniques, such as disking, can spread the weed and increase the density.

USE PESTICIDES WISELY: Always read the entire pesticide label carefully, follow all mixing and application instructions and wear all recommended personal protective gear and clothing. Contact your state department of agriculture for any additional pesticide use requirements, restrictions or recommendations.

NOTICE: mention of pesticide products on this page does not constitute endorsement of any material.

CONTACTS

For more information on identification and control of Perennial Pepperweed, contact:

- Debra A. Boelk, University of CA-Davis, Plant Sciences daboelk at ucdavis.edu
- Joe DiTomaso, University of California-Davis, ditomaso at vegmail.ucdavis.edu
- Mark Renz, New Mexico State University, markrenz at nmsu.edu
- University of California- Davis, Agriculture and Natural Resources, Weed Research and Information Center, <http://wric.ucdavis.edu/>
- USDA Agricultural Research Service, Exotic and Invasive Weeds Research http://www.ars.usda.gov/main/site_main.htm?modecode=53-25-43-00

OTHER LINKS

- <http://nbii-nin.ciesin.columbia.edu/ipane/icat/browse.do?specieId=8>

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Young, J.A., Turner, C.E. and James, L.F. Perennial Pepperweed. Rangelands, 17(4), August 1995.

rugosa rose Rosaceae *Rosa rugosa* Thunb.  symbol: RORU


Leaf: Alternate, pinnately compound, serrate, 5 to 9 ovate to elliptical leaflets, each 1 to 3 inches long, wrinkled upper surface, dark green and glabrous above, slightly waxy and pubescent beneath, obvious stipules at base of petiole.

Flower: White or pink depending on cultivar, 2 inches across, single or double, appearing throughout summer.

Fruit: Shiny deep red, fleshy "hip", 1 each in diameter, ripens in late summer.

Twig: Stout, initially green, turning brown, covered in thin, straight, sharp prickles.

Bark: Light brown very spiny.

Form: A small sprouting shrub that forms a dense cluster, reaches 4 to 6 feet.



[USDA Plants Database](#)

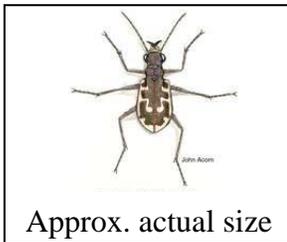
Rosa rugosa is planted in the highlighted [USDA hardiness zones](#) to the left and **may seed into the landscape**. [See a map of the states in which rugosa rose has escaped](#) (opens a new window).

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Photos courtesy: Michael Aust, John Bailey, Claude L. Brown, Bruce Bongarten, Susan D. Day, Edward C. Jensen, Richard E. Kreh, Larry H. McCormick, Alex X. Niemiera, John A. Peterson, Oana Popescu, John R. Seiler, David W. Smith, Kim C. Steiner, James E. Ward, Rodney E. Will, Shephard M. Zedaker

Text written by: John R. Seiler, Edward C. Jensen, or John A. Peterson

TIGER BEETLE IDENTIFICATION





US Army Corps
of Engineers®
New York District



THREATENED & ENDANGERED SPECIES SYSTEM (TESS) FACT SHEET

<http://tess.usace.army.mil>

The purpose of the Threatened & Endangered Species System (TESS) application is to effectively manage the data storage of T&E species observations. In the past, USACE did not have a defined protocol for data collection and storage of T&E observation data. Not having a centralized and organized source of this information it made it difficult for project managers to compile the necessary season summary reports and spatially view the locations of T&E populations.

The TESS web database application allows authorized users (as defined by the USACE project manager) the ability to input site observations (data extracted from daily and end of the season summary on-site surveys) of the T&E species into a database. The TESS website provides downloadable Microsoft Excel forms for each of the species currently supported by TESS. Upon completion of the observation forms, they are automatically transferred to the USACE project manager via email. Upon receipt, the project manager reviews the submission, makes any required modifications, and uploads the forms content into the centralized TESS database. This upload is automated through a number of database stored procedures accessible through custom Microsoft Excel forms. The original Excel submission is also maintained and archived in the TESS standard file architecture.

Once the data observation forms are submitted to the TESS database, users can download, browse, or query the database content. Keeping in mind, that some database content is sensitive, therefore public access to active datasets is restricted until the active nesting or growing season is complete. To obtain access to active season data, a user must be designated as an “authorized” user by the project manager and will be issued a username and password for data access.

To browse or query the database content, a Microsoft Excel search form is available for download from the TESS website. This Excel form contains a read-only connection to the centralized TESS application. The user can select from a variety of search variables (see image below).

The “Data Download & Mapping” page of the TESS website allows all users (however, only authorized users will be able to view active season content) to download auto-generated Google Earth KMLs and comma separated text files of database content. The automatic generation of these files provides the users with the most up-to-date information directly extracted from the TESS database. A KML file (native format for Google Earth) is built from coordinates submitted to the database to reflect the location of the site observations and site observation details. If the user prefers to simply download the full database content, a hyperlink is available that will prompt the user to download the full database details for the selected species.

SURVEY FORMS

Any user can access the Microsoft Excel data entry forms. The following forms are available:

- Flora (<http://tess.usace.army.mil/FLORA/AMARANTH/DownloadForms.aspx>)
 - **Seabeach Amaranth Observations Piping Plover Daily Site Visits**

- Fauna (<http://tess.usace.army.mil/FAUNA/PLOVER/DownloadForms.aspx>)
 - **Piping Plover Daily Site Visits**
 - **Pair and Nest Summary Form**
 - **Long Island Colonial Waterbird & Piping Plover Survey Form**

SUBMITTING & VIEWING SURVEYS

- Once the survey is complete, the user can automatically email the form to the USACE Project Manager. (Robert Smith).
- The Project Manager will review the form and make any modifications if necessary. The reviewed spreadsheet will be copied to the website server in the appropriate Site Name directory. This function can only be complete on the USACE network, and by a user with authorization.
 - \\sam-db01.mob.sam.ds.usace.army.mil\gis\Work_A044\Documents\Survey_Forms
- Once the form has been reviewed and placed on the server, the submitted surveys are available on **<http://tess.usace.army.mil/FAUNA/PLOVER/SubmittedForms.aspx>** and **<http://tess.usace.army.mil/FLORA/AMARANTH/SubmittedForms.aspx>**.
 - To download or view current season data, user must have an authorized account for the website. To obtain an account, fill out the form available on **<http://gis.sam.usace.army.mil/resource-request/index.asp?org=OP&proj=A044>**
- The Excel Spreadsheet is also loaded into the database using USACE-Only forms by the Project Manager. Once the data from the spreadsheet is uploaded into the database, users can search and plot database records.

SEARCHING DATA

- Coming Soon – all users will be able to search the contents of the TESS database online at <http://tess.usace.army.mil/FAUNA/PLOVER/Search.aspx> and <http://tess.usace.army.mil/FLORA/AMARANTH/Search.aspx>.
- Currently USACE can use a specialized Excel Spreadsheet that connects to the content of the TESS database and provides a number of fields to filter the data.

DOWNLOADING DATA & VIEWING DATA IN A MAP

- Any survey with a supplied X & Y coordinate is available for mapping on <http://tess.usace.army.mil/FAUNA/PLOVER/GIS.aspx> and <http://tess.usace.army.mil/FLORA/AMARANTH/GIS.aspx>.
- Google Earth KMLs are automatically generated based off of database content. Currently Nest Attempts and Seabeach Amaranth surveys are viewable for the 2009 season.