

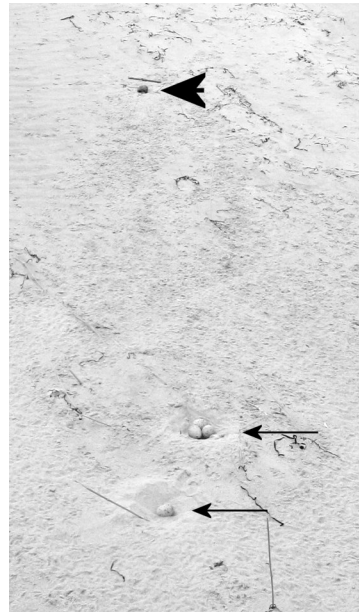


Piping Tern? Arctic Plover? Unusual Species Interactions on Plymouth Long Beach

Tony Dalisio

The summer of 2005 was an unusual season for nesting shorebirds on Plymouth Long Beach. For one thing, they were unable to successfully hatch any eggs. Due to early season storms and a high depredation rate, coastal waterbird nesting species — Piping Plover, Common, Least, and Arctic terns — fledged no new young.


The most curious event occurred toward the end of the nesting season. On June 29, there were very few nests left on the beach. Although there already had been nearly forty Piping Plover nests attempted from sixteen pairs of plovers, as well as ten Least Tern nests, twenty Common Tern nests, and a couple of Arctic Tern nests, all failed. This day, however, while making daily observation checks, Mass Audubon Plymouth Beach shorebird monitors observed something unusual. It appeared, at first glance, that a new Arctic Tern nest had been attempted at the tip of Plymouth Beach within two feet of a Piping Plover nest already containing three eggs. However, upon closer observation, the monitors realized that each Arctic Tern of the pair was incubating a nest — one on its own nest, and the other on the Piping Plover nest. During this time, the Piping Plovers stayed within the area. Eventually the female



Above: Face-off of Piping Plover and Arctic Tern on adjacent plover nests. **Right:** Piping Plover nests at bottom (arrows) and Arctic Tern nest (arrowhead) at top. Photographs by the author.

Piping Plover laid her fourth egg in a new scrape right next to her previous nest and began incubating it. Now if you can imagine, this was quite a sight!

One Arctic Tern incubated the plover nest, as the female plover was incubating the completion of her clutch, maybe eight inches away. All the while the male Piping Plover circled around the Arctic Tern on the plover nest. Just two feet south of all this activity, the other Arctic Tern incubated its own nest! At feeding time, both Arctic Terns came off their respective nests. At this point one of the Piping Plovers rolled the fourth egg into its original nest and began incubating all four eggs. Upon the return of the Arctic Terns, the Piping Plover flushed off its nest, at which point one of the terns began to incubate the plover nest again. However, the other tern did not resume incubating its own nest, and winds brought sand which began to cover the nest. At this point, the most interesting part of this sequence took place, indicating perhaps a relationship of some form between these two pairs of birds. One of the Piping Plovers approached the Arctic Tern nest and rebuilt the cup so that it did not get buried by sand. These actions were observed for most of the remaining daylight hours.

Both of these nests were depredated on the night of June 29, leaving observers to wonder what might have come from them, and why this connection took place. Those who were there will remember that day for some time. 

Mass Audubon's Coastal Waterbird Program, 2005

Andrea Jones and Ellen Jedrey

Mass Audubon's Coastal Waterbird Program (CWP) is one of the most effective entities working to protect coastal birds and barrier beaches in New England. The CWP was launched in 1987 in response to declining populations of Piping Plovers and terns in Massachusetts, with the primary objective of protecting these species' nesting areas throughout the state. This is accomplished each year through cooperation with federal, state, and local governing bodies, private and public landowners, Mass Audubon members, and the public. The number one threat to coastal ecosystems is and continues to be habitat loss due to development. For coastal birds, other primary threats include increases in predator populations, use of off-road vehicles on beaches, erosion control practices, and human disturbance.

Since its first year, the program has worked to counteract the threats to coastal nesting birds and successfully helped to recover the populations of Piping Plovers in Massachusetts from 150 pairs in 1985 to 490 in 2004 (Fig. 1). Massachusetts contains roughly one-third of the total Atlantic Coast population of Piping Plovers, which is estimated at 1600 pairs and ranges from North Carolina to Newfoundland, Canada. (The species is listed as Threatened under the Federal Endangered Species Act and the Massachusetts State Endangered Species Act.) The program monitors ninety sites on the Massachusetts coastline (Table 1), primarily on the South Shore, Buzzards Bay,

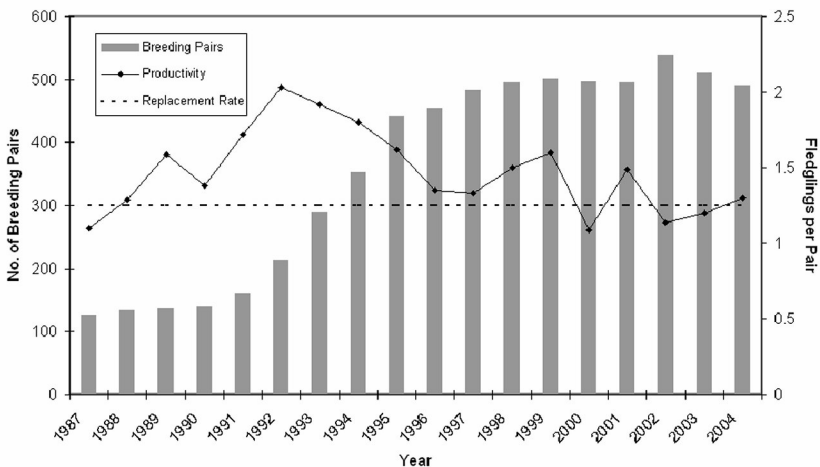


Figure 1. Numbers of Piping Plovers and Productivity in Massachusetts from 1987 to 2004.

Cape Cod, and the Islands. It protects approximately 45 percent of federally threatened Piping Plovers, 50-60 percent of Least Terns, 20 percent of American Oystercatchers, as well as many sites for Common and Arctic terns.

Our work is accomplished through our field program, which employs twenty-five to thirty seasonal staff and more than fifty volunteers each summer to work on the beaches. The vast majority of these sites are public beaches with little or no resources dedicated to the protection of these birds. The primary focus of the field program is the direct protection of nesting, feeding, and resting areas. We accomplish this using signs, rope, and fence, as well as the presence of staff and volunteers. We conduct an annual statewide census, which includes the location and number of nests, the survival of nests and young, and the causes of nest or young loss. All data is submitted to the Natural Heritage and Endangered Species Program at MassWildlife.

The overall success rate of Piping Plovers each year is determined by the number of chicks each pair produces that live over twenty-five days and are able to fly (called “fledged”). The number of chicks fledged is divided by the number of nesting pairs to produce a productivity rate. The estimated productivity rate needed to sustain the current population of Piping Plovers from year to year is 1.24 chicks/pair (Fig. 1). As shown below, the number of pairs appears to be leveling off at around 500, and productivity is close to the replacement rate. However, 2005 showed another year of decline in number of pairs and productivity.

Table 1. Preliminary estimates of Piping Plover numbers for 2005 at sites monitored by Mass Audubon’s Coastal Waterbird Program. (This represents only a portion of the total nesting sites in the state of Massachusetts.)

Town or Region Name	Piping Plover Pairs	Chicks Fledged	Productivity (chicks fledged per pair)
South Shore (4 sites in Scituate, Marshfield, Duxbury)	19	10	0.53
Plymouth (3 sites)	22	3	0.14
Buzzard’s Bay (7 sites in Westport, Dartmouth, Wareham, Bourne)	25	31	1.24
Sandwich (6 sites)	29	20	0.69
Yarmouth (4 sites)	7	3	0.43
Dennis (9 sites)	6	5	0.83
Brewster (1 site)	2	4	2.00
Chatham (9 sites)	43	57	1.33
Harwich (2 sites)	3	4	1.33
Barnstable (7 sites)	33	61	1.85
Mashpee (2 sites)	3	0	0.00
Falmouth (2 sites)	0	-	-
Eastham (1 site)	2	4	2.00
Wellfleet (3 sites)	2	4	2.00
Truro (3 sites)	6	10	1.67
Martha’s Vineyard (26 sites)	24	23	0.96
Nantucket (2 sites)	2	6	3.00
All Mass Audubon Coastal Waterbird Program sites combined	228	245	1.07

2005 Field Season Update


In 2005, Mass Audubon's Coastal Waterbird Program monitored approximately 228 pairs of a state total of 483 pairs of Piping Plovers and an estimated 1230 pairs of Least Terns at ninety-one coastal beach sites (see Table 1). In 2005, due to storm damage in May and high levels of predation, Piping Plovers had poor productivity rates in Massachusetts, the lowest in twenty years of monitoring, at roughly 1.0 chicks/pair (S. Melvin, pers. comm.). Productivity rates at Mass Audubon CWP sites were comparable to the state, averaging 1.07 chicks/pair.

Damage from two northeast storms in May caused high levels of erosion and beach alteration, particularly on beaches on the South Shore and Cape Cod Bay. Most nests and fencing, installed by CWP staff, were washed away twice or buried along with miles of fencing materials that had to be dug out by our staff. As a result, many pairs of plovers only hatched chicks after their third or fourth nesting attempts. Many nests were hatching later than normal this season during the July 4 weekend, which also proved to be a busy weekend for beach goers due to good weather. Later nesting attempts coincided with Least Terns nesting, which appeared to attract more predators to the beaches. Predation by red fox, coyote, skunks, and gulls was high this year, both in Least Tern colonies and on plover eggs. Despite many sites with little to no successful fledging this year, we had a few that survived the storms well and produced many young.

One of the sites in the state with the highest productivity was on Dead Neck Sampsons Island, Osterville. This site is co-owned by Mass Audubon and 3 Bays Preservation, Inc and monitored by CWP staff. A high of eighteen pairs of Piping Plovers produced thirty-eight chicks; overall productivity was 2.11 chicks/pair. With a grant from U.S. Fish and Wildlife Service, we installed electric fence on Sampsons Island, in an effort to reduce mammalian predation around the Least Tern colony, which grew to 203 pairs and fledged at least 100 chicks. Similar exciting results occurred when we installed an electric fence at Allens Pond Wildlife Sanctuary, which protected 250 pairs of Least Terns, as well as some plover, Common Tern, and American Oystercatcher nests.

The site with the most pairs of plovers and the highest number of chicks was South Beach in Chatham. South Beach has been monitored by the CWP since 1987, when only six pairs of plovers nested on the beach. This has since increased to a high of forty-one pairs (1999, 2002) and has remained relatively stable at about thirty-five to forty pairs since 1997. In 2005, thirty-seven pairs of Piping Plovers produced forty-nine chicks; overall productivity was 1.32 chicks/pair. In 2004 and 2005, South Beach plovers produced record numbers of chicks, and relatively high productivity compared to previous years, which was above the replacement rate of 1.24 chicks/pair. From 1997 to 2003, South Beach Plovers had poor productivity, only producing above 1.0 chicks/pair during 2001.

Next summer and beyond will reveal whether the storms and increased predation had any long-term effects on the plover population. With continued protection efforts and adaptive management, we are hopeful that, despite a few years of declining

numbers, the population will continue to remain around 500 pairs. Each year, we work on new efforts, such as installing electric fencing and restoring habitat through the use of dredge spoils, to counteract the effects of natural and human-related disturbances. 

Andrea Jones and Ellen Jedrey are Director and Assistant Director, respectively, of the Coastal Waterbird Program. The authors would like to acknowledge Scott Melvin, Massachusetts Natural Heritage and Endangered Species Program, who provided preliminary state estimates.

From US Fish and Wildlife Service

Secretary of the Interior Gale Norton released (10/6/2005) a report that shows recreational use on national wildlife refuges generated almost \$1.4 billion in total economic activity during the 2004 fiscal year. The report, "Banking on Nature 2004: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation," was compiled by U.S. Fish and Wildlife Service economists.

According to the study, nearly 37 million people visited national wildlife refuges in 2004, creating almost 24,000 private sector jobs and producing about \$454 million in employment income. Additionally, recreational spending on refuges generated nearly \$151 million in tax revenue at the local, county, state and federal level.

The report reinforces the travel industry's belief that ecotourism is becoming big business, according to Roger Dow, president of the Travel Industry Association of America, who unveiled the report with the Secretary of the Interior. The study measured the economic impact of ecotourism, large numbers of people traveling substantial distances for outdoor activities like wildlife observation and photography, as well as more traditional refuge programs like hunting and fishing.

Highlights from the Banking on Nature 2004 report include:

More than 80 percent of retail sales came from people who traveled some distance to get to national wildlife refuges and the recreational opportunities they offer. Local residents accounted for just 17 percent of total retail sales to refuge visitors.

The report shows a considerable "consumer surplus" of more than \$1 billion in 2004. Consumer surplus is a measure of how much more people are willing to pay for recreation than it actually costs them.

The National Wildlife Refuge System encompasses nearly 100 million acres and 545 national wildlife refuges. Priority uses of the National Wildlife Refuge System are hunting, fishing, photography, wildlife observation, environmental education, and interpretation.

For a copy of the report or to find more information on the National Wildlife Refuge System, visit <http://www.fws.gov/refuges/>.