S Egg Rock Update

Newsletter of the Seabird Restoration Program of the National Audubon Society

PUFFIN CAMS GO HIGH DEFINITION

More than 1.6 million viewers worldwide watched Maine seabirds live this summer

S eabirds usually live in remote locations, making them safer from predators and disturbance, but this puts them out of sight and out of mind when it comes to building conservation support. In the summer of 2012, this changed when high definition video cameras provided remarkable insight into the lives of puffins, terns, and ospreys thanks to a three-year grant from Explore.org, a division of the Annenberg Foundation.

Four cameras were set up in May: three on Seal Island National Wildlife Refuge, and one at Audubon's

Hog Island Camp near Bremen, Maine. Seal Island cameras focused on a puffin loafing ledge, inside a puffin burrow, and on Common Tern nests. Hog Island's camera featured an active Osprey nest.

Video highlights on all the cams will run until next year's nesting season, enticing new audiences to discover the wonderful world of birds, the perils they face, and to become supporters of Project Puffin. Next year, join us to see the live action May-September; meanwhile you can see video highlights at www.explore.org/birds *



Puffin Loafing Ledge Cam Viewers could watch the social order of puffins and their courtship behaviors such as billing. Also frequenting the ledge were Razorbills and Common Murres. Puffins enjoy the loafing ledge while the puffin cam shares close-up views worldwide.



Puffin Burrow Cam took viewers underground with high definition color video for an intimate view of puffin family life. A new chick, (dubbed "Petey" by his many followers) broke hearts, but created awareness, when it died because of a poor food supply. This sad turn of events helped people understand the connection birds and people have with the changing conditions of our oceans and seafood. Biologists at Project Puffin first thought this was an isolated event, however, only about half of the chicks at Seal Island survived this past summer (see feature story on puffin food, page 3). Petey's story inspired many viewers to adopt a puffin.



Ospreys "Rachel" (left) and "Steve" raised three chicks at their nest located at the Hog Island Audubon Camp. The eggs hatched in June and people around the world became enchanted with their family life (which our Audubon team helped explain online, in blogs, videos and comments). Viewers watched until the three young fledged in early September.



Common Tern Cam featured chicks growing from downy nestlings to gangly fledglings—oblivious to the cam that looked down on their nests.





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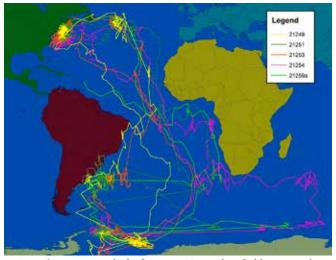
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MAINE ARCTIC TERN FLYWAYS DISCOVERED

A retic Terns hold the title for longest distance migrant. Now a new study of Maine-nesting terns establishes that terns nesting in the same colony may take surprisingly different flyways to their winter grounds in Antarctica. The new insight comes from "geolocators"—tiny devices attached to leg bands that measure day length and time providing an estimate of location. Audubon and USFWS biologists also discovered that all of the birds share the same spring migration path back to Maine. This takes them far from land as they travel up the center of the Atlantic.

mail

A study of Greenland Arctic Terns published in 2010 was the first that used geolocators to follow the champion migrants. That study found that the average annual migration distance for eleven terns was 44,055 miles. The similar study based at Eastern Egg Rock and Metinic Island NWR tagged 30 Maine Arctic Terns. Nine of the 1.6 gram devices were recovered in 2011. These terns flew an average round trip of 36,913 miles. The longest distance migrant from Maine flew a remarkable 44,637 miles in one year. For more details on the study, including maps of the migration and Marine Important Bird Areas, visit www.projectpuffin.org/ternmigration.html



Annual migration paths for five Arctic Terns, identified by ID number in legend. Each tern's path is shown by a different color on the map. Map courtesy of USFWS, Maine Coastal Islands National Wildlife Refuge.

MAINE PUFFINS' WINTER HOME DISCOVERED

The recovery of two geolocators placed on puffins in 2009 has helped to shed light on the little known winter life of puffins. Audubon researchers discovered that the two tagged puffins left Seal Island NWR and travelled north to the Gulf of St. Lawrence and then south to the Bermuda Plateau before returning to their nesting island. The puffin with the most wanderlust was dubbed Cabot. He travelled far offshore to the northern Labrador Sea before heading south to the vicinity of Bermuda during the winter of 2010. To see a map of his travels, visit www.projectpuffin.org/ wanderingpuffins.html

PUFFINS, BUTTERFISH AND CLIMATE CHANGE IN THE GULF OF MAINE

Maine lobsters made national news this year by molting in April, which was 2-3 months earlier than usual. The early harvest glutted the market, driving the price per pound to a near record low. The news reports focused mostly on how this created trouble for the industry, but the back story was yet another example of the effects of a warming climate on people and wildlife.

This year, biologists recorded the warmest waters known to date for the Gulf of Maine and documented the earliest known plankton bloom, which was in full swing by early March—at least one month earlier than usual. Kevin Friedland, a scientist in NOAA's Northeast Fisheries Science Center summed up the 2012 season for the Maine coast: "Changes in ocean temperatures and the timing of the spring plankton bloom could affect the biological clocks of many marine species, which spawn at specific times of the year based on environmental cues like water temperature."

Animals lower in the food chain, such as the fish on which puffins feed, had a head start with their annual growth because of the early plankton bloom. This was especially problematic for puffins that brought butterfish back to their chicks. Butterfish delivered to puffin chicks in 2012 were the largest recorded in the past eight years, averaging more than twice the length of an average parent puffin's bill.

Puffin chicks can barely swallow small butterfish because of their round shape and usually reject large butterfish. That likely happened this year, as evidenced by the numerous large butterfish that were often found discarded in individual burrows. The abundance of large butterfish, and the shortage of other fish of more suitable sizes and shapes, contributed to a poor year for rearing puffin chicks. The food shortage, along with a June storm that flooded some burrows, resulted in only about a third of the puffin chicks surviving to fledgling age. Fortunately, bluefish were abundant this year, comprising 13% of the pufflings' food. Although bluefish are about as long as butterfish, they are not as round and the puffin chicks are usually able to swallow them.

The Gulf of Maine is noted for its highly productive waters. Here, an annual massive plankton bloom energizes the marine food chain by feeding animals ranging from tiny zooplankton to whales. Phytoplankton (microscopic plants) responds to fresh water from rivers running to the ocean which delivers nutrients such as silicates and nitrates that are necessary for their growth. Puffins and other seabirds depend on the appearance of a few specific kinds of small, nutritionally rich fish at just the right time to feed their young. So, the synchronization of the nesting season with availability of such fish is necessary for puffin chicks to survive. When water temperature increases by even a few degrees, this can affect the size and species composition of the fish that are available to puffins. For this reason, the growth and survival of puffin chicks is an ideal indicator of changes to the Gulf of Maine climate.

At mid-coast Maine puffin colonies, white hake typically makes up a third or more of the puffin's food. However, fishery biologists have found that hake, along with about half of the 36 fish stocks studied in the Northwest Atlantic Ocean, have shifted further northward over the past four decades, with some disappearing from US waters entirely as they move farther offshore. Alternate kinds of fish for puffin chicks will likely become increasingly important and these will need to be just the right size for the chicks to survive.



The warmest temperature on record for the Gulf of Maine waters produced an abundance of butterfish that were too large for Atlantic Puffin chicks to swallow. Many discarded butterfish were found inside burrows where pufflings died due to starvation.



The shape of fish has much to do with their value to puffin chicks. Bluefish (left) are just narrow enough to swallow, especially if they arrive late in the season when chicks are larger. During a "good food year," puffins can collect large loads of hake (right), which have a high food value and are shaped long and slender—easily swallowed by pufflings.

This past summer has shown that climate effects such as higher water temperatures can have surprising effects throughout the marine habitat. Like the early-shedding lobsters, butterfish too, apparently got an early start due to the warmer-than-usual water and early plankton bloom—growing so fast that they became too large for puffin chicks to swallow. Over the past five years, the Seal Island puffins have produced 0.77 fledglings per pair and the colony has grown to over 500 pairs; this year they produced just 0.31 fledglings per pair, the lowest productivity since the colony was restored in 1992. Since adult puffins can live for decades, a single poor nesting season is not a major problem for this puffin biologists and interns will be watching carefully to document and better understand the effects of climate change on puffin nesting.



Maine Isla

eather, predators and forage fish all played a part in the outcome of the 2012 seabird season on Audubonmanaged islands in the Gulf of Maine.

WEATHER In 2012 Audubonmanaged islands in the Gulf of Maine experienced the warmest average air and sea surface temperatures since 2002. The number of foggy days was well below average, as was the amount of rainfall. During the first week of June, a storm with strong winds reached 40 mph at Egg Rock and dumped heavy rain (4 inches in one day on Outer Green Island!). High seas occurred during an already high tide cycle and flooded many puffin and razorbill nests. The storm also destroyed five observation blinds, three observation towers, and most of the murre decoys at Matinicus Rock.

PREDATORS Two river otters, the first ever

recorded at Eastern Egg Rock, caused a decline in nesting puffins from 123 to 104 pairs by eating eggs and birds before they were removed in early July. Roseate and Arctic terns also declined, likely because of the otters and predation from Herring, Great Black-backed and Laughing gulls. At Outer Green Island, a Bald Eagle disrupted the colony by taking tern fledglings at earliest dawn; likewise more eagles and Peregrine Falcons than in 2011 regularly flushed the seabirds at Seal Island NWR. A "Scarey Man" inflatable device was installed to scare away the eagles.

FOOD Herring, the ideal seabird food, was abundant in the diet of Common Terns this summer at all colonies except Matinicus Rock. At Seal Island NWR, herring (mostly obtained from a site 12 miles away) comprised 50% of the chick diet. Herring also made up 63% of the chick diet at Pond Island NWR, and was so abundant that terns sometimes brought back several at a time, more than the chicks could consume. Though abundant for terns, herring was scarce for puffins at Seal Island and Matinicus Rock, who fed undersized hake and oversized butterfish (see page 3), resulting in low nesting success.

Audubon Research Islands in the Gulf of Maine

AX.

Portland • Outer Green Island

Stratton Island

STRATTON ISLAND

- 1,033 pairs of Common Terns nested, the second highest number since 2002.
- 112 Least Tern pairs nested, and fledged at least 72 chicks, highest productivity in recent years.
- Roseate terns increased from 51 pairs in 2011 to 71 pairs this year, and fledged 93 chicks.
- A complete Common Eider census found 649 nests, an increase of 276 nests since 2006.



OUTER GREEN ISLAND

- 1,034 pairs of Common Terns produced 1,468 chicks.
- New artificial turf habitat (carpet) was installed in 2012 and was utilized by 26 pairs of nesting terns.
- Despite all guillemot nests being washed out by large waves in an early June storm, 55% re-nested and successfully hatched chicks.

Seal

Island

NWR

Matinicus

Rock

Rockland

Hog Island

Eastern Egg Rock



John Gorey (above) examines a Stratton Island Least Tern chick (left).



Assistant Sanctuary Manager Nathan Banfield with a Great Horned Owl that was trapped and removed from Pond Island NWR on the first day of the 2012 nesting season. The owl was relocated to Northern Maine by the staff of Avian Haven in Freedom, Maine.

POND ISLAND N.W.R.

- Two Great Horned Owls were captured and relocated from the island, saving the tern colony from certain failure.
- 597 pairs of Common Terns nested, the highest since restoration began in 1996. Addam DiNuovo
- An average of 2.31 chicks fledged per nest—the highest in the Gulf of Maine for a total of 1,379 chicks fledged!
- Terns sometimes delivered 2, 3, and even 4 large herring to their chicks at a time.



Egg Rock Update 2012

MAP BY ROBERT HOUSTON

Ind Updates





Egg Rock Supervisor, Maggie Post (second from left) is joined by interns Kate MacNamee, Kristina McOmber, and Kiah Walker as they set out to band puffin chicks.

EASTERN EGG ROCK

- 817 Common Tern pairs produced 825 chicks and 57 Arctic Tern pairs produced 14 chicks. Roseate Tern productivity was the highest it has been in recent years with 71 pairs fledging 93 chicks.
- 104 pairs of puffins were confirmed nesting; two river otters disrupted the colony early in the season.
- 2,065 Laughing Gull nests were counted, similar to the 2,051 nests in 2011.
- Y33 successfully nested and Y54 was sighted. These are the oldest puffins in North America.

JENNY ISLAND

- 948 pairs of Common Terns nested, the most since 2000.
- 11 pairs of Roseate Terns fledged 15 chicks.
- Common Tern productivity was a near record high 2.04 chicks fledged per nest, resulting from a diet dominated by high-quality herring.



SEAL ISLAND N.W.R.

- 1,837 Common and 959 Arctic Tern pairs nested, the largest tern colony in Maine. They fledged about 2,500 chicks.
- At least 504 pairs of puffins nested. Two geolocators for puffins were deployed and two from 2011 were recovered.
- 25 Great Cormorant pairs (Threatened status in Maine) produced at least 35 chicks.
- A Red-billed Tropicbird spent 70 days at the island for its 8th consecutive summer.



Celso Sho, a marine warden with Belize Audubon, prepares a Seal Island Atlantic Puffin chick for banding.

MATINICUS ROCK

- Puffins' productivity was just 0.43 chicks per nest due mainly to poor-quality food.
- 9 geolocators were recovered from Atlantic Puffins and 3 more were deployed.
- 693 Arctic and 268 Common Tern pairs nested, but only about 475 chicks fledged due to poor-quality food and predation by gulls.
- Two Manx Shearwater chicks were banded.
- Razorbill productivity was a low 0.23 chicks per nest, due to predation and flooding by storms.









A Stratton Island Roseate Tern takes advantage of one of the nesting shelters installed by Road Scholars.



Road Scholars from the Hog Island Audubon Camp install geotextile (black underlayer) and outdoor carpet to create new tern habitat on Eastern Egg Rock. To the left of the new habitat is a plot created in 2011 using this method.

HOG ISLAND CAMP SEABIRD BIOLOGY & CONSERVATION SESSION

Participants of the Road Scholar-sponsored Hog Island Audubon Camp session aided the ongoing effort to create new tern nesting habitat in early June. The 35 Road Scholars built and placed 100 tern nesting shelters on Stratton Island. A U.S. Fish and Wildlife Service grant funded the purchase of habitat improvement materials.

Egg Rock Update 2012

2011–2012 CONTRIBUTORS

Contributions listed were received from October 1, 2011 through September 30, 2012. Space restrictions prevent us from listing our 225 Supporter-level friends. Every donor is important to us and we sincerely regret any omissions. Your continuing participation makes our work possible.

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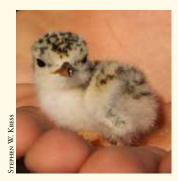
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