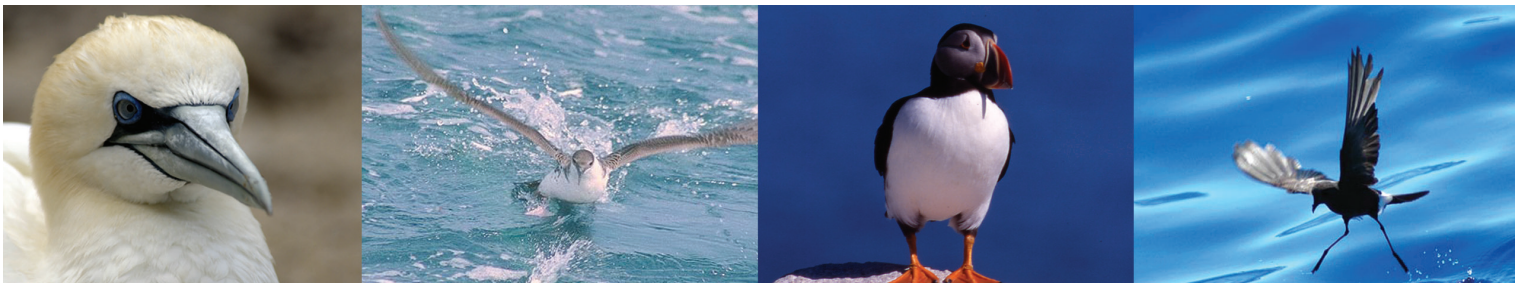
Northwestern Atlantic
Marine Bird Conservation Cooperative

2013 Update: Seabird Research and Conservation Activities in the Northwestern Atlantic



The Northwest Atlantic Marine Bird Conservation Cooperative 2013 Annual Meeting

The Northwest Atlantic Marine Bird Conservation Cooperative met March 6-8, 2013, in Charleston, South Carolina, in conjunction with the Circumpolar Seabird Expert Group (CBird) meeting. Both groups met together for most of the first day, and shared Country and project updates. Cooperative members met the following day and a half and discussed highest priority science needs for marine birds, how to address data gaps, where to focus resources, and pre and post-construction monitoring for offshore wind projects. A summary of the meeting and copies of presentations can be found on the Marine Bird Cooperative website at www.acjv.org/marinebirds.htm.

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Atlantic Marine Assessment Program for Protected Species (AMAPPS)

The purpose of this multi-agency (U.S Fish and Wildlife Service [FWS], National Oceanic and Atmospheric Administration [NOAA], Bureau of Ocean Energy Management and The Navy) project is to gather baseline information on the distribution and density of marine birds (FWS), turtles and mammals (NOAA) in the marine environment. The Division of Migratory Bird Management (FWS) is in the 4th year of aerial seabird surveys using transects perpendicular to the coast out to a depth of 30m or 50nm from the coast. During these surveys all seabirds encountered as well as sea turtles and marine mammals are counted. The Service surveyed the south Atlantic coast in summer 2010 and flew the Wind Energy Areas (WEAs) off Virginia in December 2010. In summer 2011, FWS surveyed the entire Atlantic coast, from Maine to mid-Florida, flying approximately 7,300 nautical miles of transects. In 2012, the entire Atlantic coast was surveyed in March and October. In September (2013), FWS flew a full coast survey with four FWS air crews in Kodiak aircraft with personnel from the Division of Migratory Bird Management (R5 & HQ) and the Coastal Program (R5) conducting counts. Data from this effort will give the FWS and partners in marine conservation better scientific information about the distribution and abundance of seabirds in the offshore environment. Specifically, we hope to be able to estimate densities for each transect, by season, for the common species and/or species groups (e.g., large terns); certain species are difficult to identify to the species level in this type of survey. These data also are being provided to other researchers to aid in modeling the exposure component of risk; risk analyses will be used for regulatory planning when reviewing potential alternative energy leases along the Atlantic Coast. During FY2014, the Service is scheduled to fly one more winter aerial survey for seabirds.

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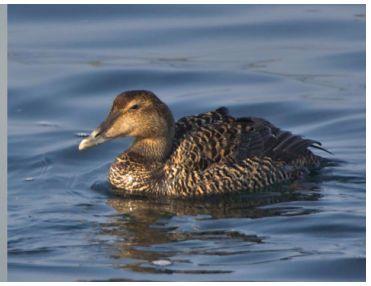
Mid-Atlantic Baseline Ecological Assessment

Final report of the Mid-Atlantic Marine Wildlife Surveys, Modeling, and Data Workshop has been released and is available for download at: http://mhk.pnnl.gov/wiki/index.php/Mid_Atlantic_Marine_Wildlife_Surveys_Modeling_and_Data_Workshop_to_Establish_Coordination_and_Communication

Contact: Jocelyn Brown-Saracino, New West Technologies, LLC, In Support of the US Department of Energy - Wind and Water Power Technologies Office, jocelyn.brown-saracino@ee.doe.gov

Wilson's Storm-Petrel Tim Jones



Tracking Caribbean Seabirds

Tracking work on Caribbean seabirds is continuing through Patrick Jodice (Clemson Univ), William Mackin (Guilford College), and a host of collaborators. To date, the team has been able to establish tracking efforts in The Bahamas (Audubon's Shearwater, White-tailed Tropicbird), Jamaica (Masked Booby), Tobago (Audubon's Shearwater, Red-billed Tropicbird), Statia (Red-billed Tropicbirds), and Mexico (Masked Booby). This fall they hope to initiate tracking work on the British Virgin Islands (Magnificent Frigatebird, Brown Booby). These efforts have been funded by USFWS, NFWF, and other sources. Each project has a collaborator from the home island and much of the work has grown out of the Seabird Capacity Building workshop that Patrick Jodice, William Mackin, Chris Haney, Lisa Sorenson, and Ann Sutton conducted during summer of 2012 in San Salvador, Bahamas. The SC Coop Unit also initiated a project during the spring of 2013, funded by BOEM, tracking Brown Pelicans from colonies in Texas, Lousianna, and Florida.

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SEANET (Seabird Ecological Assessment Network)

This past year we have focused on finishing our Field Guide to Beached Birds of the Southeastern United States. It has come together beautifully with the help of many collaborators, and we anticipate a publication date shortly after the New Year. This year, we have also broadened our network of partners in order to make our data more accessible to researchers and to the public. Through a partnership with the Wildlife Health Event Reporter (www.wher.org), all of our beached bird reports can be downloaded and mapped by anyone. We also have assisted the developers of the Cape Wind project in Massachusetts with a study design for their required bird monitoring project, and this year we will be beginning a study evaluating our own methods to ensure we are using the best possible science. This summer we worked with a large team of scientists and wildlife managers on a presentation at the Wildlife Disease Association meeting on the die-offs of Atlantic Puffins and Razorbills. It was well received and we plan to continue following the status of both species to determine what impact, if any, the mortality events may have on the population. We continue to expand our network of beach walkers, and our training conducted in South Carolina in June generated 20 new monitored beaches. We hope to continue our focus on recruiting volunteers in New England and the Carolinas throughout 2014.

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Black-capped Petrel on Hispañiola

In the 2013 breeding season, American Bird Conservancy's (ABC) partner, Grupo Jaragua, monitored 41 Black-capped Petrel nests in the Loma del Toro area, and documented fledging success of 60%. Another ABC partner, Environmental Protection in the Caribbean (EPIC), along with Grupo Jaragua and Société Audubon Haiti, conducted radar surveys at 15 sites in the Dominican Republic and Haiti in January and February 2013. This was the second year of EPIC's radar monitoring on Hispañiola. The group documented numerous petrel flyways; at least some of these could lead to unknown nesting areas. Fieldwork was supported largely by a grant to ABC from the U.S. Fish and Wildlife Service's (USFWS) Division of Migratory Bird Management. In July, at the meeting of the Society for the Conservation and Study of Caribbean Birds in Grenada, ABC and USFWS convened a meeting of the international Black-capped Petrel working group to exchange new information and solicit a review of the actions table in the Black-capped Petrel Conservation Action Plan, with an eye for setting priorities for activities over the next few years.

Contact: Holly Freifeld, Seabird Program Director, American Bird Conservancy, hfreifeld@abcbirds.org

Masked Booby. USFWS

Atlantic Canada Pelagic Seabird Monitoring and Conservation Program

The Canadian Wildlife Service (CWS) continues to use ships-of-opportunity to survey the birds in waters off Nova Scotia, Newfoundland and Labrador. Since 2006, we have surveyed over 105,000 km of ocean track and counted over 167,000 birds. In 2013, we increased our survey effort in the eastern Arctic to fill important spatial and temporal data gaps, and are anticipating more survey effort in Atlantic Canada this coming winter. With partners, these data are now being used to identify and address threats to birds in their marine environment, including the development of species distribution models to predict core use areas on the Scotian Shelf, and consequently where they may be most vulnerable. We are also working towards establishing the analytical methods for estimating trends in both distribution and abundance from data collected in eastern Canada between 1965 and the present.

Contact: Carina Gjerdrum, Canadian Wildlife Service, Dartmouth, Nova Scotia; carina.gjerdrum@ec.gc.ca

Determining Offshore Use of Diving Bird Species in Federal Waters of the Mid-Atlantic United States using Satellite Tracking

As interest mounts in using mid-Atlantic waters to construct commercial wind developments, there is a pressing need to implement tracking studies for a broad suite of marine birds across the region to provide a comprehensive understanding of marine bird movement and occurrence. Such information will be added to data currently being collected by comprehensive offshore marine bird surveys (such as AMAPPS) to ensure that wind facilities are not constructed in marine bird hotspots. Tracking studies also will provide background data on bird use in an offshore area prior to wind turbine construction so displacement effects can be identified after turbines are built. A three-year project was recently initiated to tag Red-throated Loons , Surf Scoters, and Northern Gannets with platform terminal satellite transmitters (PTTs). Satellite-tagged birds relay precise locations multiple times a day, providing researchers with detailed movement and occurrence data on these focal species during winter and migration, when substantial proportions of their populations use federal waters (3 to 200 nautical miles from shore) of the mid-Atlantic U.S. The three focal species have disparate habits and life history strategies, representing a cross-section of marine birds found throughout the region, and are recognized as "species of conservation concern" or "conservation focal species" by the U.S. Fish and Wildlife Service. The project

Northern Gannet. Tim Jones

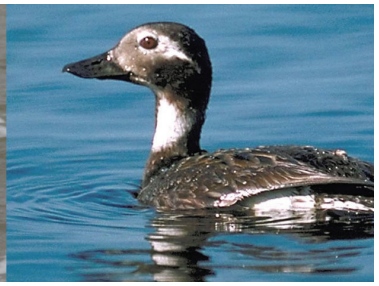
will also test new satellite attachment methods with the goals of increasing tag longevity and reducing adverse impacts of tags on study subjects.

The project, which is being funded by the Bureau of Ocean Energy Management (BOEM) and coordinated by the USFWS Division of Migratory Birds, involves multiple collaborators including USGS Patuxent Wildlife Research Center, BioDiversity Research Institute, the Montevecchi Lab at Memorial University of Newfoundland, and state wildlife agencies.

Collaborators completed a second season of fieldwork in April 2013. During two field seasons, 35 gannets, 35 scoters, and 43 loons, were tagged with PTTs. Tagged birds continue to be tracked, with the 2013 cohort currently embarking on fall migration. An annual report summarizing 2012 research activities and preliminary findings was submitted to BOEM in May 2013, and preliminary data analyses are underway. Project cooperators will attempt to tag another 60 birds early next year. It is anticipated that the project will be completed in mid-2015.

Contacts: Caleb Spiegel, U.S. Fish and Wildlife Service, caleb_spiegel@fws.gov or Jim Woehr, Bureau of Ocean Energy Management, james.woehr@boem.gov



Satellite Tracking Razorbills in the Gulf of Maine

Maine Coastal Islands National Wildlife Refuge deployed 10 solar, satellite tags (Microwave Telemetry 9.5gm) on razorbills breeding at the Matinicus Rock seabird colony in Maine. Project objectives were: 1) Test the ability to externally attach satellite tags to razorbills 2) Identify foraging areas utilized by chick-rearing razorbills and 3) Document at-sea characteristics of razorbill foraging habitat (during chick rearing, migration, and wintering). We believe this is the first attempt to externally equip razorbills with satellite tags, which are capable of diving to 120 meters to find fish. The birds were captured in their burrows while they were attending chicks. Satellite tags were attached to the birds' backs using four sutures. The birds primarily foraged within 25 km of the breeding colony, and were observed feeding on herring and hake. Upon departing the breeding colony, the birds spent several weeks near a small razorbill colony located 125 km from Matinicus Rock colony. We believe the birds may have undergone a post-breeding season molt at this location. We anticipate tagging additional razorbills at multiple breeding colonies in 2014. Data is available for viewing at: http://www.seaturtle.org/tracking/index.shtml?project_id=881

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Metapopulation Dynamics and Ecology of Roseate Terns

Jeff Spendelow (U.S. Geological Survey-Patuxent Wildlife Research Center [USGS-PWRC]) coordinates PWRC's long-term cooperative research project on the metapopulation dynamics and ecology of the endangered Northwest Atlantic breeding population of Roseate Terns (ROSTs). His personal fieldwork in 2013 - in collaboration with several cooperating organizations and other colleagues including MassAudubon's Coastal Waterbird Program (MACWP; Ellen Jedrey, Cris Luttazi, Kathy Parsons, Karli Rogers), the US National Park Service's Cape Cod National Seashore (CCNS; Mary Hake, Nuray Taygan), the US Fish and Wildlife Service (Stephanie Koch), and on Nantucket Island (Edie Ray, Jonathan Shuster) - is being done during the postbreeding dispersal period (PDP) from late July through September at staging sites in the "Cape & Islands" area of southeastern Massachusetts (MA). Funding from the Canadian Wildlife Service (CWS) has allowed MACWP to hire two people for a 3-week period to work with Jeff to resight banded and color-banded ROSTs. As in 2011-2012, we are looking at temporal and geographic variation in staging site use in MA by hatch year (HY) ROSTs given 3-character plastic field-readable (PFR) bands as chicks in Nova Scotia, Maine, New Hampshire, Connecticut, and (new for 2013) New York. This season we saw three ROSTs banded as chicks in 2012 that returned to North America in 2013 (ignoring "conventional wisdom" to stay in South America). As of 12 September we also had seen more than half of all the former HYs seen in 2011 on Cape Cod as returning two-year-olds indicating that a significantly higher percentage of the entire breeding population is making use of the Cape & Islands area during the PDP than we once suspected. Use of these islands could put the breeding population at risk due to hurricanes, oil spills, habitat modification, and other threats. Two highlights so far are that during a 6-hour period on 31 August Jeff resighted 68 HYs (probably representing almost 20% of the ROST chicks given these bands in 2013) and 23 adults (for a total of 91 ROSTs with PFR bands) on a small section of beach known as "Race Point North" in the Provincelands section of the CCNS. On 21 August in the Nauset Estuary area - and then on several other days later in the North Beach, Chatham area of CCNS, Jeff read the "national band" on a Sandwich Tern that had been banded as a chick in 2002 at Coquet Island, Great Britain. Thanks to all the cooperators and volunteers who contributed to the color-banding and resightings of ROSTs in 2013.

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Biodiversity Research Institute - Offshore Surveys, Contaminants, and Data Management Projects

Mid-Atlantic Region

On behalf of the Department of Energy (DOE), the Biodiversity Research Institute (BRI) in Gorham, Maine, continues to carry out broad-scale surveys for marine birds, marine mammals, and sea turtles in the mid-Atlantic region. This project is now in its second year of boat-based surveys and high-definition aerial video surveys to obtain baseline data on wildlife distributions and densities, and environmental covariates. The original study area covered federal waters from Delaware to Virginia, out to the 30m isobath, and included three of the federally-identified Wind Energy Areas (WEAs). This year, with funding from the State of Maryland, BRI added an extension to these boat and aerial surveys to include Maryland state waters.

As part of this project, BRI has carried out a direct comparison of high definition video aerial and boat-based survey methods, the results of which are currently under review. The third year of the project will be dedicated to risk assessment and modeling within a hierarchical framework, a proven statistical method for separating observational and ecological processes and understanding factors that influence species distributions and relative abundance.

This continuing project is a broad collaboration between BRI and HiDef Aerial Surveying, Inc., Richard Veit (City University of New York), Beth Gardner (North Carolina State University), and Ari Friedlaender and David Johnston (Duke University Marine Laboratory).

Contaminants

With support from the Maine Outdoor Heritage Fund, BRI is using focal marine bird species as biomonitors to assess the current degree of mercury contamination across the Gulf of Maine ecosystem. Sentinel species sampled are Double-crested Cormorant, Common Eider, Black Guillemot, and Leach's Storm-Petrel. Sample analyses will be carried out this winter. Project partners include the U.S. Fish & Wildlife Service, Maine Dept. of Inland Fisheries & Wildlife, and the National Audubon Society's Seabird Restoration Program, without whose assistance in collecting blood samples the assessment would not be possible.

Data Management

BRI is managing tracking data from several projects involving large numbers of satellite tags. The first is part of the multi-year collaborative work of the Seaduck Joint Venture (SDJV). Hundreds of implanted satellite tags have been deployed over the last decade and work is ongoing to collect, organize, filter, and map these data for analyzing the spatial patterns of seaduck species. A second project, funded by the Bureau of Ocean Energy Management (BOEM), seeks to understand the winter and migratory movements of Northern Gannets, Red-throated Loons, and Surf Scoters in relation to potential offshore wind development in the mid-Atlantic region. These data are similarly managed for eventual analysis and mapping. An online mapping portal is being developed for collaborators to provide near-real time data display.

Contact: Iain Stenhouse, Biodiversity Research Institute, iain.stenhouse@briloon.org

Atlantic Marine Bird Mapping, Modeling, and Biogeographic Assessment Efforts at NOAA's National Centers for Coastal Ocean Science (NCCOS)

Mid-Atlantic Marine Bird Predictive Mapping—Results Available Fall 2013

As part of the "Compendium of Avian Information: Phase II" project funded by BOEM and led by USGS Patuxent Wildlife Research Center, NCCOS has collaborated with USGS for the past two years to produce seasonal statistical models and high-resolution maps of estimated long-term average relative occurrence and abundance of approximately 30 marine bird species off the Mid-Atlantic U.S. coast, from

Common Eider. Jim Fenton

Cape Hatteras to Cape Cod, based on at-sea survey records in the Compendium database. Maps and models were developed to support spatial planning and environmental assessment of offshore renewable energy facilities, in particular offshore wind. This work was presented at the Pacific Seabird Group Annual Meeting in February, and the Northwest Atlantic Marine Bird Conservation Cooperative meeting in March. A final report and digital data package was submitted to BOEM in September of 2013 and made available to the public via NCCOS and BOEM websites and appropriate data portals.

Atlantic Seabird Mapping and Modeling—Maine to Florida

In May of 2013, NCCOS launched the next phase of its marine bird mapping and modeling efforts, expanding the scope to the entire U.S. economic exclusive zone (EEZ), from Florida to Maine. Funded by BOEM and in cooperation with USGS, USFWS, and other Federal, public, academic and NGO partners, NCCOS will conduct integrative statistical modeling and predictive mapping of marine bird distribution and abundance on the Outer Continental Shelf of the U.S. Atlantic coast, from Maine to Florida. Models will be developed using a combination of at-sea marine bird survey data in the Avian Compendium database and marine environmental data records. Models of occurrence and abundance will be integrated with vulnerability and sensitivity indices being produced by other research groups to develop a comprehensive suite of high-resolution map products, with associated accuracy assessments, to aid in spatial planning and environmental assessment of offshore wind facilities. Initial results are expected in mid-late 2014 and final results in late 2015.

Statistical Analyses to Support Guidelines for Marine Avian Sampling

In January 2012, NCCOS and USGS began a BOEM-funded study focused on statistical power analysis for marine bird relative abundance and occurrence "hotspot" and "cold spot" detection, with a goal of supporting statistically-based guidelines for timing, frequency, and spatial distribution of marine bird surveys needed to guide placement of offshore renewable energy facilities, such as wind farms, to reduce potential impacts on birds. The first phase of this project was completed in December 2012 and the report and supplementary information are available online at http://www2.coastalscience.noaa.gov/publications/search.aspx, then searching for "avian sampling". The second phase of this project involves further development of species-specific statistical guidelines for hotspot and cold spot detection over the next two years in collaboration with USGS and Michigan State University.

Science to Support Risk-Mapping for Marine Birds and Wind Energy

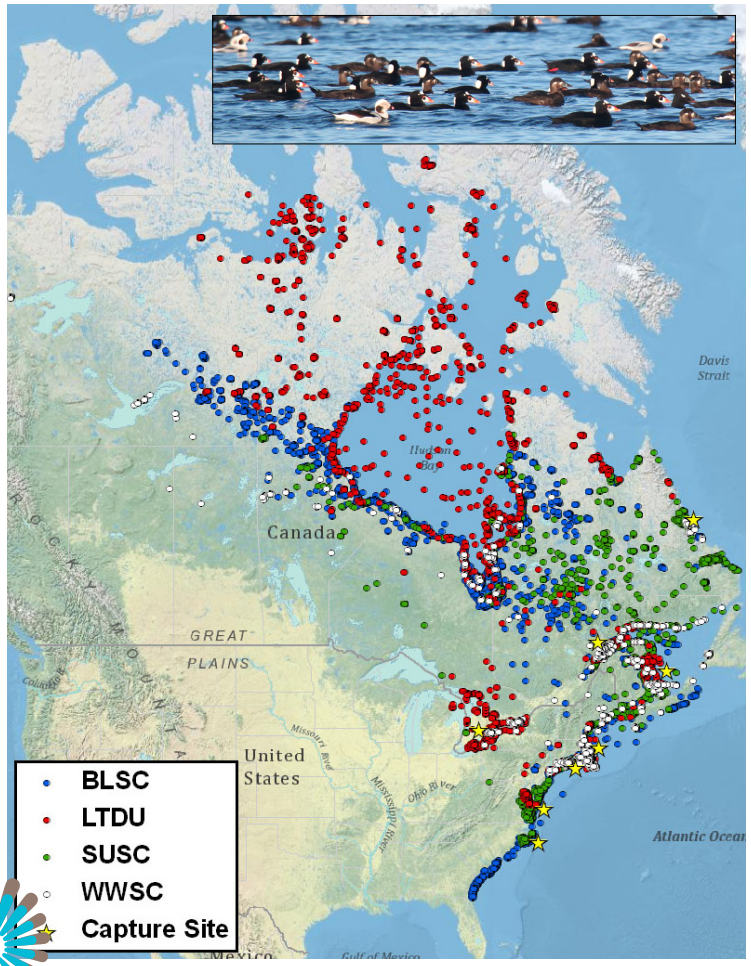
As part of the project "Mapping the Distribution, Abundance and Risk Assessment of Marine Birds in the Northwest Atlantic: Phase 1" funded by the North Atlantic Landscape Conservation Cooperative, a multi-investigator group involving North Carolina State University, NOAA/NCCOS, Biodiversity Research Institute, and the City University of New York is working towards developing a framework for marine bird risk mapping for wind energy planning in the Mid-Atlantic. Results of this project were recently presented in a webinar given as part of the USFWS Northeast Region Science Seminar Series.

Contact: Beth Gardner, North Carolina State University, bagardne@ncsu.edu

Sea Duck Joint Venture, Atlantic and Great Lakes Sea Duck Migration Study

The SDJV launched an ambitious, large-scale satellite telemetry study of sea ducks in the Atlantic Flyway in 2009, with more than 200 transmitters deployed so far by study partners. Target species include all three scoters (Black, Surf, and White-winged) and Long-tailed Duck. The overall goal of the study is to improve our understanding of the links among breeding, wintering, staging, and molting areas (i.e., population delineation) for these species, which is essential to understanding sea duck declines and limiting factors. In addition, the study is identifying the spatial and temporal habitats most important to sea ducks, thus helping to evaluate potential impacts from development, harvest, and climate change. This project is complementary to other ongoing studies of marine birds in the Atlantic, including a BOEM study assessing diving bird use of offshore areas along the mid-Atlantic coast.

The study is greatly improving our understanding of migration patterns and range affiliations for sea ducks in eastern North America. Some of the more notable results include: 1) documentation of a previously unknown major breeding area for Black Scoter west of Hudson Bay and in Hudson Bay lowlands; 2) emerging evidence of two potentially separate wintering populations of Long-tailed Duck, one wintering primarily off the coast of Nantucket, MA and another wintering in Chesapeake Bay, MD; 3) high annual fidelity of Black Scoter to a molting area in James Bay; used by a high proportion of molting males, and some females; 4) further documentation of Chaleur Bay in New Brunswick and Quebec, and the St. Lawrence Estuary, as staging areas for high proportions of all species marked; 5) Lake Erie may be a key staging area for Long-tailed Duck wintering in Chesapeake Bay; 6) Belcher Islands in Hudson Bay appears to be a key



Surf Scoter and Long-tailed Duck. Tim Bowman

stopover for Surf Scoter and Long-tailed Duck during fall. Capture and marking efforts have been highly successful for Black Scoter, and most objectives have largely been met for this species. The focus has now shifted to filling in gaps for Surf Scoter, Long-tailed Duck, and White-winged Scoter. More than 50 transmitters will be deployed in Surf Scoter in Quebec during October 2013. More information about the study can be found at http://seaduckjv.org/atlantic_migration_study.html.

Contact: Tim Bowman, Sea Duck Joint Venture Coordinator Wildlife Biologist, U.S. Fish and Wildlife Service, Tim_Bowman@fws.gov

Southeast Fisheries Science Center Seabird Bycatch Project

Beginning in 2004, the Southeast Fisheries Science Center has worked in collaboration with the Pelagic Observer Program (POP) to conduct a seabird project to enhance reporting and quantifying the seabird bycatch of the U.S. pelagic longline fleet operating in the Western North Atlantic. The POP had been recording the bycatch of seabirds, along with other protected species, since 1992, however the SEFSC Seabird Bycatch Project improved the quality of the data and applied the data regularly to examination of bycatch characteristics and, with the additional use of pelagic longline logbook data, estimate the total seabird bycatch of the fleet. Data improvement activities include seabird identification training sessions with observers as part of full training sessions scheduled by the POP, review of detailed seabird bycatch incidence forms prepared by observers, identification of photos provided by observers when identifications are not provided or are questionable, and interaction with the POP on seabird bycatch data records to improve accuracy and detail, e.g., identifications to species, rather than higher taxonomic level. We conducted two training sessions in 2012 and one so far in 2013. In addition, we were responsible for getting a new, previously unrecognized species, the Northern Fulmar, added to the database. This joins the Great Black-backed Gull and Cory's Shearwater as additions to the database after the start of the SEFSC Seabird Project. Analytical results and seabird bycatch fleet estimates through 2011 were reported in a contribution to the 2013 National Bycatch Report. Temporary lack of funding prevented analyses of data through 2012, but we expect to have new analyses and updates soon.

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Foraging strategies and facilitative interactions among Common (*Sterna hirundo*) and Roseate Terns (*S. dougallii*) in the Northwest Atlantic Ocean.

Marine resources are characteristically patchy and concealed beneath the surface of a "featureless" ocean, which makes facilitative species interactions especially advantageous to seabirds. My research addresses how behavioral mechanisms accommodate prey availability, or more specifically, how Common and Roseate Terns locate and access food when it is not easily detectable. Reported in the first chapter is the study of their foraging behavior and ecology, offshore in the pelagic realm, around the colony, and in nearshore waters; chapter 2 covers the breeding season (June-July), while chapters 1 and 3 examine the pre- or early-breeding and post-breeding seasons. My research tests the hypothesis that, as broadly-ranging seabirds, Common and Roseate Terns forage over habitat where marine mammals and predatory fish help to find and access prey. I quantify the spatial association among foraging terns, tunas, dolphins, and their habitat, using Bayesian hierarchical models, and tests of behavioral community interactions. Facilitation explains how terns benefit from subsurface predators through local enhancement and commensal relationships: foraging tunas improve the detection and availability of prey by signaling their presence, and driving them to the surface. Additionally, I evaluate the link between resource utilization and foraging strategy, measured by nest provisioning and patterns among foraging routes or feeding flocks. I propose that the opportunistic generalists, Common Tern, depend more on social cues than the specialists, Roseate Tern, which rely more heavily on spatial memory to find predictable prey. Increased breeding and foraging success in Roseate Tern relates to higher quality and abundance in their preferred prey, sandlance (Ammodytes spp.), whereas Common Tern endure prey limitation through their use of local enhancement. Lastly, I hypothesize that habitat variability and prey availability predict interspecific differences in tern foraging. Behavioral tests and density-surface models, with distance sampling, show that foraging Common and Roseate Terns respond positively to the distribution and abundance of each other and their preferred prey. Clearly, Common and Roseate Terns use each other and subsurface predators to encounter prey via facilitation: such interactions create dynamic hotspots that need to be considered in an ecosystem approach to marine spatial planning.

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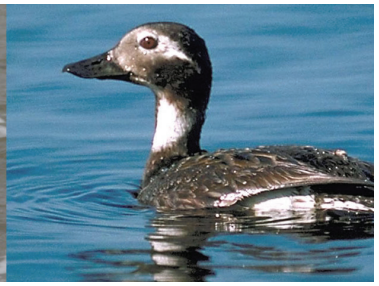

Compendium Phase II - Database Update

As part of the Atlantic Seabird Compendium Phase II project, USGS received funding from the Bureau of Ocean Energy Management (BOEM) for database and GIS support for modeling, maintaining the growing database and making data and information available to the public.

We have or are in the process of integrating additional contemporary datasets to enrich the value of the database. Andrew Gilbert of the Biodiversity Research Institute (BRI) is assisting with the work. The list of datasets includes New Jersey DEP 2008-09, Rhode Island Ocean SAMP Boat and Aerial surveys 2009-10, Dick Veit's ships of opportunity surveys (EcoMon and Acoustic Herring) to present, and data from Woods Hole Oceanographic Institute in 2010.

The first product released from this work summarized effort data as web-mapping services so that interested parties could recreate the summary maps produced for the 2011 workshop on marine bird science and offshore wind held in Herndon, VA. See http://catalog.data.gov/dataset/atlantic-offshore-seabird-dataset-catalog.

We worked with several research collaborators as part of this project, including Dr. Beth Gardner at NC State University, Dr Brian Kinlan in NOAA's Biogeography Division and Dr Elise Zipkin at Patuxent Wildife Research Center to support multiple modeling efforts. Work with Kinlan and Zipkin included the creation of predictive maps for the NOAA/BOEM report OCS Study BOEM 2012-101: "Statistical Analyses to Support Guidelines for Marine Avian Sampling." The GIS and metadata files associated with the report were packaged and made available upon request.

As a final step for this phase of the project a snapshot of the database will be deposited in appropriate repositories so that data are more widely available and as a form of data backup.

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Compendium Current Work Update

As part of Phase II of the Compendium effort, the seabird database was to be prepared for transfer to the U.S. Fish and Wildlife Service (USFWS) for long-term stewardship. At the beginning of 2013, USFWS began supporting the database, and decided to keep the database on USGS servers and focus on adding new datasets and data dissemination in support of the user community. USGS and USFWS are now working together on data sharing policies and data release via the web, and on identifying and prioritizing (in conjunction with NOAA) the next datasets for inclusion into the repository, such as BRI's Atlantic baseline surveys for the Department of Energy, AMAPPS aerial surveys, and USFWS seaduck surveys. In addition, as part of the "Best Darn Bird Map" project, Dick Veit recently completed a quality control review of the entire database to identify and correct discrepancies in misinterpreted bird codes. We are working with Dick to incorporate his edits into the Compendium.

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Stellwagen Sanctuary Seabird Stewards Program (S4), NOAA/Stellwagen Bank National Marine Sanctuary

Just off the coast of Massachusetts, between Cape Ann and Cape Cod, lies a wild area teeming with life and rich in history. Stellwagen Bank National Marine Sanctuary was designated as a marine protected area in 1992 for a multitude of reasons, including its high natural productivity and species diversity, as well as its long history of human use. The 842-square mile sanctuary supports 575 known species, including 53 species of seabirds, and the list is largely incomplete. More information on the Stellwagen Bank sanctuary: http://stellwagen.noaa.gov/welcome.html. Stellwagen Bank National Marine Sanctuary Final Management Plan: http://stellwagen.noaa.gov/management/fmp/fmp2010.html, State of seabirds on pp. 90-97.

Stellwagen Bank National Marine Sanctuary, in collaboration with Mass Audubon, has expanded its study of seabirds in the sanctuary. The goals of the Stellwagen Sanctuary Seabird Stewards program (S4) are threefold: to systematically collect baseline data on seabirds within sanctuary boundaries to compare populations over time; to educate the public about seabirds and connect residents with their sanctuary; and to train a group of observers to join scientists in this groundbreaking project. The resulting data will be used to compare relative abundance of seabirds over time, to track species diversity and intra- and inter-annual variability--to help us understand populations within the sanctuary and their possible impacts on local ecosystems and as a barometer for other changes in the environment. The data will be shared with partner organizations such as NOAA Northeast Fisheries Science Center, Boston University's Marine Program, US Fish and Wildlife Service, and the Northwestern Atlantic Marine Bird Conservation Cooperative.

Volunteer Stewards accepted into the Stellwagen Sanctuary Seabird Stewards Program have the rare opportunity to join sanctuary and Mass Audubon staff at sea as part of this long-term research program. Stewards are trained to collect data on standardized strip-and-line transect cruises on the sanctuary research vessel, Auk, and on commercial whale watch vessels.

To date, 50 active volunteers have been recruited and trained, and an additional 50 are working toward becoming S4 Stewards. We completed a pilot project in 2011, and are now in our second full year of the study. Thanks to our funders, NOAA, the Blake-Nuttall Fund, and U.S. Fish and Wildlife Service, we have been able to run five standardized transect cruises on the R/V Auk each year. We have also collected opportunistic data on more than 75 whale watch trips. This year, we added three more whale watch partners, for a total of six companies and work out of five ports: Provincetown, Barnstable, Plymouth, Boston and Gloucester. Stewards collect data nearly every week from June – October, and we hope to start collecting data on whale watch trips as early as April or May next year. In 2014, we will target and train more recruits on the north shore of Massachusetts and in New Hampshire and hopefully add Newburyport as a sixth port, to collect more data in the northwestern sanctuary region. We will publish a report this year with a summary of our initial findings and future goals.

Observing seabirds from a commercial whale watching trip. Debra Reynolds

The S4 program has increased the sanctuary's research capacity, and it has also benefitted our outreach and education programs. Birders are terrific networkers, and our efforts are posted regularly on Mass Bird, Cornell's E-Bird and other local outlets. Principal Investigator, Anne-Marie Runfola, has presented on sanctuary seabirds and the S4 program to a wide variety of audiences along the entire length of Massachusetts and beyond. She has created a packet of educational materials for teachers and has trained volunteers to run seabird activities at informal education events. The Stewards are often introduced on the whale watch trips, and they provide a report for the naturalists to announce at the end of each cruise, helping introduce thousands of people each year to the sanctuary's seabirds and their importance not only in our waters but worldwide.

Shearwater Satellite Tagging

At our first Marine Bird Cooperative Meeting, Linda Welch from USFWS talked about tagging shearwaters in the Gulf of Maine and the need for more data in this region. We offered to host her team at the sanctuary, and sanctuary Research Coordinator, Dave Wiley, Linda Welch and our respective teams tagged ten birds this year. Five tags are still active. For more information, go to:
Press Release: http://stellwagen.noaa.gov/news/pdfs/shear20130812pr.pdf
Maps and Photos: http://stellwagen.noaa.gov/science/shearwater13.html

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South Atlantic Information Resources: Data Search And Literature Synthesis

This nearly 1000 page report provides a synthesis of information for marine resources and environments in BOEM's South Atlantic Planning area (SC, GA, N FL). It includes chapters on cetaceans, sea turtles, and sea birds as well as benthic environments, physical oceanography, and fish. http://www.data.boem.gov/homepg/data_center/other/espis/espismaster.asp?appid=1 and enter 2013-01157 into the box for publication number (also check the box to the left of publication number) then hit submit.

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