North Carolina

North Carolina Partners
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Productivity Monitoring
USFWS, the National Seashores, the NC Coastal Reserve System, Fort Fisher State Recreation Area, the USMC, and Audubon NC together manage and monitor about half of the state's nesting pairs and manage about another 50 without productivity monitoring. The NCWRC posts islands representing another 15-20 pairs.

Banding
Nearly all partners participate in the state banding program, which continues to work under Ted Simons's permit. This year we banded 129 chicks and 38 adults (including one metal-only bird who got new bands).

Predator Management
In addition to predator management (trapping) at sites representing roughly a third of the state nesting population, two sites (Masonboro NC Coastal Reserve and Pea Island NWR) used cameras to monitor nests and determine nest fate. Masonboro did this work through funds remaining from the BMP demo project and compared video vs. still footage and efficacy of different camera settings.

AMOY-WIPL Census
NC undertakes a tri-annual census for AMOY and WIPL. This has been ongoing since 2003 and covers all nesting habitat in the state. Audubon NC developed a written protocol with the state partners, which had not existed before. It was based on the parameters established by Nathan Hostetter's work with detection probabilities. Data are still being finalized. Provisionally, we found 391 total pairs, down from 440 in 2016.

Research Projects
Several research projects are underway in the state that focus on or include AMOY. Kate Goodenough with the University of Oklahoma put out two pilot dataloggers on nesting AMOY in collaboration with Audubon NC. These units record GPS-quality location data at frequent intervals, allowing for study of fine-scale habitat use. Two UNC-W graduate students, Angie Hall and Anna Zarn, are examining mercury, arsenic, and selenium in the AMOY food chain (sediments, shellfish, AMOY) on the Cape Fear River and comparing it to samples obtained elsewhere, including on Cape Lookout NS. We have had interest in the sexing technique used previously to sex birds using DNA obtained from feathers, and Shilo Felton or Lindsay Addison can put you in touch with the lab (in Portugal!).

Habitat Projects
Audubon NC has received funding to build four patch oyster reefs near AMOY nesting rakes on the Cape Fear River. These rakes are intended to improve the oyster stock (which is less than was there historically), enhance marine habitat and water quality, provide adjacent foraging for nesting AMOY, and, if they last long enough, provide a source of shell to help supply the natural rake building and

maintenance process. Audubon NC has also applied for funding from NAWCA small grants to enhance existing shell rakes on the CFR that are becoming too low for successful nesting.

Hurricane Impacts

Hurricane Florence made landfall in Wilmington last September 14th and stayed for a few days, causing a high-tide/storm surge event that lasted for about three days. Barrier islands in southeastern North Carolina were extensively overwashed, and the Outer Banks were affected as well. The Cape Fear River, where about 100 pairs of oystercatchers nest and where about 400-500 individuals winter, experienced an anoxic event where dissolved oxygen was zero for about a month. This killed essentially all of the oysters on the river. Multiple resident banded birds went missing following the storm, presumably because they died. Clutch initiation was delayed, and number of pairs that laid eggs, amount of renesting, and productivity were all down in 2019. Barrier island AMOY were less affected, and overwash improved barrier island habitat.

Hurricane Dorian made landfall this September 6th and the Outer Banks received a strong storm surge that opened many new inlet and cuts on Cape Lookout National Seashore. Just over 50% of Ocracoke's breeding AMOY pairs nested (7 of 12 pairs in 2019) at South Point on Ocracoke Island this year. Hurricane Dorian made landfall on September 6th and submerged all of South Point for several days and changed the habitat significantly. This could have an effect on breeding AMOY in upcoming seasons.

At Cape Lookout NS, Hurricane Florence improved the breeding habitat in 2018, but the soundside surge flooding from hurricane Dorian in 2019 damaged the backroad system on North Core Banks that we have used as a management tool to detour traffic around broods on the beach. The majority of the cuts are healing/welding together on the active beach due to longshore sediment transport. This is leaving ponds that have broken up the backroad into unusable sections. This will impact how we manage chicks on the beach for years to come on North Core Banks. Also we confirmed that coyote are now on North Core Banks, in addition to South Core and Shackleford.

Future Work

Pea Island NWR is hoping to continue the camera work next season and is eager discuss some options for predator management challenges and chick shelter designs.

Cape Hatteras NS will likely be making a coordinated effort to install game cameras on select number of AMOY nesting sites in 2020 to better understand loss of eggs and chicks at an early age as it relates to predation. It has also solicited APHIS for predator control for much of the 2020 pre-breeding, breeding, and post-breeding season. APHIS will be targeting specific historical breeding areas of AMOY, PIPL, and CWB and targeting mammalian and avian predators. Ongoing efforts include banding of all AMOY chicks possible and general daily pre-breeding, breeding, post-breeding, and migratory monitoring efforts.

Audubon NC will continue its productivity work with partners and management of approximately 140 nesting pairs of AMOY. We will be continuing its regular non-breeding (August-March) roost surveys in the southern part of the state. Our research projects will also continue in 2020, when we will wrap up the food chain sample collection and deploy more dataloggers on dredge, natural, and barrier islands. These will be similar to the 2019 units and include remote download capability.