

American Oystercatcher Working Group Position Paper

Purpose

The purpose of this position paper is to highlight the role that the American Oystercatcher Working Group plays in prioritizing, supporting and promoting collaborative and individual projects aimed at furthering our understanding of oystercatcher biology. It also serves as a potential working group model for other priority species that require a regional approach to science-based conservation and management.

History

The American Oystercatcher (*Haematopus palliatus palliatus*) was one of several species identified in the US Shorebird Conservation Plan (Brown *et al.* 2001) as having small enough populations to warrant special attention. As a result, the High Priority Shorebird Group (HPSG), which met in November 2001, decided that a regional research strategy for the American Oystercatcher was necessary to adequately address the following research priorities: breeding and wintering population estimates; identification of limiting factors among all life stages; and demography. The group decided to focus efforts on American Oystercatchers as a focal species for coastal shorebird conservation. On December 19, 2001 several representatives from the HPSG convened a meeting in South Carolina with federal, state and non-governmental agencies responsible for managing shorebirds to discuss the possibility of forming a regional oystercatcher working group to address the abovementioned research priorities. The meeting attendees agreed to the formation of such a group and decided its first course of action would be to obtain a complete population estimate during the winter when the birds congregate on elevated roost sites at high tide. This was achieved the following winter using a combination of aerial surveys, photography and ground counts from New Jersey to Texas, which resulted in a range-wide population estimate of 11,000 birds (Brown *et al.* 2005).

Since the initial meeting in 2001, the American Oystercatcher Working Group (hereafter referred to AOWG or Working Group) has met every year at various locations within the birds' Atlantic coast range. Its membership is a voluntary group of participants from state and federal agencies, non-governmental organizations, and research institutions. Working Group meetings typically involve presentations by individuals engaged in oystercatcher monitoring and research followed by group discussions on a variety of regional management, conservation and research topics. These annual meetings paved the way for many of the AOWG accomplishments, including the development of an American Oystercatcher Conservation Plan that was supported by the Western Hemispheric Shorebird Reserve Network and the National Fish and Wildlife Foundation (see *Working Group Accomplishments* below for a complete list of achievements), and a revised version of the Conservation Plan developed in conjunction with the U.S. Fish and Wildlife Service to serve as a Focal Species Plan for oystercatchers.

The Working Group achievements thus far clearly indicate that oystercatchers are good targets for coastal conservation. Their dependence on undisturbed coastal habitats such as undeveloped barrier beaches, sandbars, shell rakes, salt marsh islands, and shellfish flats provides further justification for protecting these sensitive areas. Moreover, many of the threats they face (e.g.,

loss of habitat from coastal development, disturbance from human recreational activities, elevated predation from predators associated with human activities, contamination of their primary food sources by non-point pollution and/or oil spills, effects of global climate change) are shared by many other coastal specialists; thus conservation efforts for oystercatchers will undoubtedly benefit these species as well. Lastly, the continued monitoring of oystercatcher populations at the regional level can provide useful insight into the overall health of coastal ecosystems. For example, localized declines in breeding and non-breeding populations can alert land managers to significant habitat perturbations. Similarly, the birds' slow shift from natural habitats to human-created habitats (i.e., dredge spoil islands and rooftops) in some parts of the range may indicate that natural habitats are no longer suitable in these areas. Additionally, the American oystercatcher is one of the few birds that feed primarily on marine bivalves. Because of its unique dietary preferences, this species has the potential to serve as a bioindicator of the marine ecosystem. Only through collaborative monitoring can one measure the entire population's functional response to localized and range-wide threats, which in turn, can help direct management and protection efforts where they are most needed.

Mission Statement

The AOWG seeks to develop, support and implement range-wide research and management efforts that promote the conservation of Atlantic coast American Oystercatchers and their habitats through individual and partnership-based initiatives guided by recommendations of the Working Group's membership.

Goals and Objectives

- Develop management objectives in a science-based, adaptive management framework
- Monitor population trends at local, regional, and continental scales
- Obtain reliable estimates of demographic parameters and the factors that affect them
- Understand how variations in demographic parameters affect population viability over space and time
- Identify threats to American Oystercatcher populations
- Translate these findings into management actions that promote American Oystercatcher conservation

Current Membership

Audubon of Florida
Cape Hatteras National Seashore
Cape Lookout National Seashore
Cape Romain National Wildlife Refuge
Chincoteague National Wildlife Refuge
City University of New York
Clemson University
College of Staten Island

College of William and Mary - Center for Conservation Biology
Conserve Wildlife Foundation of New Jersey
Delaware Division of Fish and Wildlife
Doris and Pat Leary, Independent Researchers and Photographers
Eastern Shore of Virginia National Wildlife Refuge
Edwin B. Forsythe National Wildlife Refuge
Florida Fish and Wildlife Commission
Georgia Department of Natural Resources
Maryland Department of Natural Resources
Manomet Center for Conservation Sciences
Mass Audubon
Massachusetts Div. of Fish and Wildlife - Natural Heritage Program
Monomoy National Wildlife Refuge
New Jersey Division of Fish and Wildlife
New Jersey Audubon Society
New York State Department of Environmental Conservation
National Audubon
North Carolina Audubon
North Carolina Wildlife Resources Commission
Rutgers, The State University of New Jersey
South Carolina Department of Natural Resources
St. Catherines Island Foundation
The Nature Conservancy – Virginia Coast Reserve
Trent University
University of Georgia
USGS NC Cooperative Fish and Wildlife Research Unit, North Carolina State University
USGS SC Cooperative Fish and Wildlife Research Unit, Clemson University
Virginia Department of Game and Inland Fisheries

Working Group Accomplishments

The Working Group has achieved a number of research, management and conservation milestones during its short tenure. These accomplishments have stemmed from site specific, regional and rangewide projects and have contributed significantly to our overall understanding of oystercatcher ecology. These efforts have also generated momentum among Group members to continue to work on individual and collaborative projects to gain further insight into the biology and conservation needs of the American Oystercatcher. Below we summarize the Working Group's accomplishments to date.

Collaborative Work

Collaboration on the part of the Working Group has led to a number of significant achievements all of which are listed below. These efforts have increased cohesion among group members and serve as important stepping stones for future collaborative efforts.

- Consensus among the group to hold annual meetings in order to facilitate collaboration and information exchange.

- Development of a standardized banding protocol.
- Initiation of re-sighting surveys throughout most of the species' range.
- 2002-2003 Range-wide Winter Survey (Brown et al. 2005).
- Development of the American Oystercatcher Conservation Plan (www.whsrn.org/data/Unsorted/Amoy-20466-1.pdf).
- Establishment of the American Oystercatcher Working Group website (www.ncsu.edu/project/grsmgis/AMOY/AMOYworkinggroup_2004.htm)

Individual Projects

Since the advent of the AOWG, members have engaged in a number of individualized monitoring and research projects that have shed light on many aspects of oystercatcher biology, ecology and demography throughout the species range. Moreover, the impressive number of localized monitoring efforts (e.g., breeding productivity, post-breeding movement patterns, health assessment, etc.) that have been initiated since the formation of the Working Group has demonstrated the need for developing standardized monitoring protocols so that results from individual projects are statistically comparable. Table 1 summarizes the number and scope of individualized projects that have been completed, are ongoing, or still need to be completed.

Future Collaborative Work

Working Group Research and Monitoring Protocols

- Standardized productivity data collection and data analyses
- Standardized re-sighting protocols and data analyses
- Standardized breeding and wintering population survey protocols and data analyses
- Standardized protocols for collecting morphometric, genetic, and health assessment data and samples

Research

- Mark-resight studies
- Band detectability studies
- Foraging behavior and diet studies
- Impacts of pollutants (e.g., non-point source runoff) on oystercatcher survivorship
- Impacts of disease and other health related issues on the population
- Identify key winter roost sites in Florida, Maryland, and Delaware
- Impacts of sea level rise and climate change
- Adult, sub-adult and juvenile survival rates
- Current and predicted demographic rates and their influence on future population trends
- Adult, juvenile and sub-adult post-breeding dispersal patterns and their effect on fecundity, survival and recruitment rates
- Differences in reproductive rates on beaches vs. alternative habitats
- Development of genetic models
- Impacts of human disturbance on oystercatcher reproductive success, vigilance behavior, local movement patterns, and roost-site selection.
- Impacts of mammalian and avian predators on oystercatcher reproductive success
- Assess management alternatives (i.e., regulating disturbance, controlling predators)

Monitoring

- Coordinated range-wide breeding and wintering surveys
- Coordinated productivity monitoring at key Atlantic coast breeding sites
- Coordinated range-wide health assessment surveys

Management

- ORV management
- Human disturbance management at key nesting and wintering areas (e.g., signage, area closures, public outreach and education)
- Predator management
- Breeding and non-breeding habitat conservation and management through land acquisition, regulatory protection and other means
- Creation of new breeding habitat through carefully designed use of dredge material
- Breeding and non-breeding habitat restoration

Other

- Conservation planning
- Long term data storage
- Bibliography updates
- Website Management
- Establishing funding sources

Literature Cited

Brown, S, C. Hickey, B. Harrington, and R. Gill, Eds. 2001. The U. S. Shorebird Conservation Plan, 2nd ed. Manomet Center for Conservation Sciences, Manomet, MA.

Brown, S., S. Schulte, B. Harrington, B. Winn, J. Bart, and M. Howe. 2005. Population size and winter distribution of eastern American Oystercatchers. *Journal of Wildlife Management* 69: 1538-1545.

Table 1. Summary of research and monitoring projects conducted by members of the American Oystercatcher Working Group and their associates. This includes work initiated prior to the formation of the Working Group.

BREEDING AND WINTERING POPULATION SURVEYS						
State	Partners	Project Title	Year Initiated	Project Status ¹	Project Description	Publications/Reports Citations ²
NY	NYS DEC	Biannual breeding surveys	~1998	Ongoing	??	Summary reports, NYS DEC
MA	MDFW, Monomoy NWR	Statewide annual breeding surveys	2002	Ongoing	Intensive surveys and monitoring of the abundance and distribution of breeding AMOY throughout the state by a variety of cooperating agencies and organizations	Annual summary report, MDFW; most recent Melvin 2007.
MA	Mass Audubon	annual breeding surveys	2003?	Ongoing	Survey of breeding AMOYs at sites where piping plovers are monitored, additional sites added as located (marshes not generally surveyed)	Mass Audubon annual reports submitted to state <i>NHESP</i>
NJ	NJDFW, Rutgers USFWS, NPS	Annual breeding surveys	2003	Ongoing	Intensive surveys and monitoring of barrier beach/beach strand portion of population during entire breeding season.	Annual summary of data, NJDFW, unpubl.
NJ	Rutgers	Annual breeding survey – selected major (study) sites	2004	Ongoing	Intensive surveys and monitoring of populations at select high-density breeding areas during entire breeding season. Surveys and monitoring conducted at 3 select study sites from 2004 – 2007 to be expanded to additional high-density sites identified during 2007 surveys of coastal salt marshes and back bays.	Annual reports submitted to NJDFW – most recent Virzi 2007
NJ	Rutgers	Breeding survey in alternate habitats along NJ coast	2007	Complete	Intensive boat surveys of NJ salt marshes and back bays conducted during May – June 2007 to locate oystercatchers breeding in alternate habitats in an effort to better determine statewide breeding population. Surveys conducted along entire Atlantic coast of NJ at approximately 400 randomly selected points based on predictive habitat models. Statewide breeding population census hoped to be conducted in next several years.	Report for NJDFW - Virzi <i>In prep.</i>
NJ	NJDFW, Rutgers, NJAS, Wetlands Institute	Annual winter surveys	2002	Ongoing	Single coast wide aerial survey conducted by NJDFW in late Nov. 2002, repeated in early Dec. 2004. Ground/boat surveys of all known roost locations conducted 2004-2007 in early Dec. (additional surveys completed in Jan. and Feb. 2007). It is anticipated that survey will be conducted for at least one survey period (Dec.) in future years.	NJDFW unpubl. data
VA	TNC, VDGIF, USFWS	Annual breeding surveys of the VA Coast	2001	Ongoing	Annual surveys of breeding AMOY on the VA coast. Conducted in conjunction with annual Piping Plover and Wilson's Plover surveys. Geographic scope includes all barrier islands, three sites on the western shore of the Chesapeake Bay and two sites off of Virginia Beach.	Croll and Beck 2001; Wilke and Beck 2002; Wilke 2004; Wilke and Watts 2004; Wilke 2005; Wilke and Boettcher 2007; Boettcher <i>et al.</i> 2007
VA	TNC, VDGIF, USFWS	Winter surveys of AMOYs in coastal Virginia	1999	Ongoing	Annual surveys of all known winter roost sites in Virginia's seaside barrier island/lagoon system. Geographic scope is	TNC and VDGIF, unpubl. data; Nol <i>et al.</i> 2000;

					though to encompass all of AMOY winter roosts with the exception of one small roost site along the Chesapeake Bay. Currently, surveys are repeated annually but will eventually move 2-4 year intervals.	Wilke <i>et al.</i> 2008b
VA	TNC, VDGIF, USFWS, CCB	Statewide survey of breeding AMOYs in Virginia	2003	Ongoing	Survey of breeding AMOYs in all suitable nesting habitat in Virginia. Geographic scope includes Virginia's barrier island/lagoon system and eastern and western shorelines of the Chesapeake Bay. Initial survey conducted in 2003; repeated surveys to be conducted at 5 year intervals.	Wilke <i>et al.</i> 2005
NC	NCWRC, NC Audubon, NC State Coop Unit, NPS and other partners	Coastwide surveys of breeding AMOYs in North Carolina	2004	Ongoing	Surveys of breeding AMOYs along NC's barrier and estuarine islands. Initial survey conducted in 2004 and repeated in 2007. Surveys will continue every three years.	NCWRC, unpubl. data
SC	SCDNR	Winter surveys	1999	Ongoing	Annual surveys of all known SC winter roost sites were conducted 1999-2002. A survey is planned for winter of 2007/2008. Future surveys are not scheduled but optimally will occur every 5 years	Sanders et al. 2004
SC	Clemson University, SC Coop Unit	Fall/Winter Roost Surveys	1999-2002	Completed	Multiple within-season surveys conducted at major roost sites on Cape Romain NWR. Study yielded information on the consistency of roost use, what conditions affected roost site selection, and at what spatial or temporal scales specific conditions influenced selection.	Peters and Otis 2007
SC	SCDNR	AMOY web site	2005	Ongoing	Web site summarizes statewide surveys	
SC	SCDNR	Breeding surveys	2001	Ongoing	Annual statewide surveys of known breeding sites were conducted 2001-2003. Future surveys are not scheduled but hopefully will occur every 5 years.	Sanders et al. in prep.
GA	GADNR	Distribution and Estimate of Breeding Pairs	1999	Periodic survey	Foot, boat and helicopter surveys of all known or suspected oystercatcher habitat in Georgia	Winn, B. 2000. The Oriole 65:41-49
FL	AoF, FWC, Audubon Chapters	Annual breeding surveys of the Florida Gulf Coast.	1980	Ongoing	The Florida Coastal Islands Sanctuaries Program surveys the Florida Gulf Coast nesting AMOY population annually, often in cooperation with state and local partners. The data set extends from the mid-1980s and is presently being analyzed. Additional data for other state locations, various years.	Hodgson, Paul and Rachal. <i>In prep.</i>
FL	FWC	Shorebird website	c. 2000	Ongoing	The Florida Fish and Wildlife Conservation Commission maintains an internet data repository.	
FL	FWC	Statewide AMOY census	2005	Completed	The Florida Fish and Wildlife Conservation Commission and partners conducted a statewide AMOY census.	
FL	VARIOUS	Christmas Bird Count	Many years	Ongoing	Christmas Bird Counts	
FL	American Bird	Spring and Summer survey results	Many years	Ongoing	American Bird summaries	
FL	Leary	Breeding and winter roost surveys and monitoring	2000	Ongoing	Year round shorebird data collection with special focus on PIPL, REKN and AMOY (including nesting success, disturbance monitoring, winter roost census / monitoring, band data collection and photo documentation	Data submission to: FWS, FWC, FNAI, NPS and AOWG

BREEDING PRODUCTIVITY MONITORING						
State	Partners	Project Title	Year Initiated	Project Status*	Project Description	Publications/Reports Citations**
MA	MADFW, Mass Audubon, Monomoy NWR, Manomet Center for Conservation Sciences	Statewide productivity monitoring	2002	Ongoing	Determine reproductive success and productivity estimates of AMOY nesting in the state. Some of this work is done in conjunction with Piping Plover productivity studies. Under these circumstances, AMOY monitoring is sometimes limited to a few site visits and fledgling counts.	Annual summary reports, MDFW; most recent – Melvin 2007.
MA	MADFW, CUNY, NCF, TTOR,	Reproductive success on the islands of Massachusetts	2005	Ongoing	Modeling differences in reproductive success and productivity at different locations throughout Nantucket County.	Dissertation in prep.
NJ	Rutgers	Comparing nest success in alternate habitats	2004	Ongoing	Modeling daily survival rates of nests on barrier beaches and alternate habitats including saltmarsh and inlet/dredge-spoil islands.	
NJ	NJDFW, Rutgers USFWS, NPS	Annual breeding surveys	2003	Ongoing	Determine reproductive success and productivity rates collected as part of annual breeding surveys completed for barrier beach/beach strand portion of population.	Annual summary of data, NJDFW, unpubl.
VA	TNC, VDGIF, USFWS	Barrier island productivity study	2001	Ongoing	Assessment of AMOY reproductive rates on Virginia barrier islands	Croll and Beck 2001; Wilke and Beck 2000; Wilke 2004; Wilke and Watts 2004; Wilke 2005; Wilke <i>et al.</i> 2005; Wilke and Boettcher 2007; Boettcher <i>et al.</i> 2007; Wilke <i>et al.</i> 2008a, <i>in review</i> ; Wilke <i>et al.</i> 2008b, <i>in press</i> .
VA	TNC, VDGIF, USFWS	Productivity monitoring in Virginia's barrier island/seaside lagoon system	2002	Ongoing	Productivity monitoring on barrier islands and marsh habitats in Virginia to measure success of various management strategies.	Wilke 2004; Wilke and Watts 2004; Wilke 2005; Wilke and Boettcher 2007; Boettcher <i>et al.</i> 2007
NC	NCWRC	Productivity studies	2004	Ongoing	Productivity monitoring on estuarine islands	Annual reports available
NC	NCSU, NC Coop Unit, NPS, NC Audubon	Comparing reproductive success in barrier island and river island habitats in Coastal North Carolina	2002	Complete	We monitored reproductive success and compared nest survival and fledging rate at Cape Lookout National Seashore and on Audubon managed islands at the mouth of the Cape Fear River. Nesting densities and nest survival were much higher in river habitats, but fledging success was equally low	McGowan et al. 2005a

					in both habitat types.	
NC	NC State Coop Unit, NPS, Audubon, NCWRC	Productivity monitoring on NC barrier islands and adjacent areas	1995	Ongoing	AMOY productivity monitoring began on South Core Banks, Cape Lookout National Seashore in 1995 and has continued and expanded annually. Productivity from >1,500 nests documented from 1995 to present.	Simons et al. 2008a and previous annual reports, McGowan and Simons 2006, McGowan 2004, Davis et al. 2001, Davis 1999.
SC	Clemson Univ., SC Coop Unit, SCDNR, Cape Romain NWR	Reproductive success in Cape Romain	2006	Not completed	2006-2008 Assessment of AMOY reproductive rates on shell mounds in Cape Romain Region.	Graduate thesis in prep.
GA	GADNR, UGA	Reproductive Ecology of the American Oystercatcher	2000	MS Thesis	Monitoring reproductive effort for two seasons at all nesting locations within three distinct sounds	R. C. George, University of Georgia, 2002
GA	GADNR, UGA	Reproductive success of American Oystercatchers at managed sites in Georgia	2000	Chapter of thesis	Comparison of hatching success at locations with different management regimes and varying levels of disturbance	George, R. C. et al. 2004. The Oriole 69:43-53
FL	AoF, FWC, FPKs, Audubon Chapters	Annual breeding surveys of the Florida Gulf Coast.	1980	Ongoing	The Florida Coastal Islands Sanctuaries Program surveys the Florida Gulf Coast nesting AMOY population annually, often in cooperation with state and local partners. The data set extends from the mid-1980s and is presently being analyzed. Additional data for other state locations, various years.	Hodgson, Paul and Rachal. <i>In prep.</i>
FL	FWC	Shorebird website	c. 2000	Ongoing	The Florida Fish and Wildlife Conservation Commission maintains an internet data repository.	
FL	Leary	Shorebird studies	1999	Ongoing	Collection and dissemination of nesting status	Data submission to: FWS, FWC, FNAI, NPS and AOWG
BANDING/RESIGHTING STUDIES						
State	Partners	Project Title	Year Initiated	Project Status*	Project Description	Publications/Reports Citations**
NY	CUNY	Resighting of wintering AMOY	2005	Ongoing	Efforts focused on resighting banded AMOY at known NY winter roost site, Jones Inlet at Jones Beach State Park, NY.	Annual summary of data, Murphy, unpubl.
MA	Mass Audubon	Resighting of breeding and non-breeding AMOYs, particularly at South Beach, Chatham and other Cape Cod sites	2004	Ongoing	Periodic re-sighting incidental to other work on the heavily used sites, including more focused efforts during the staging period on South Beach, Chatham during 2007 - 2009	Annual data submission to AOWG
MA	USFWS, NCSU, Manomet Center for Conservation Sciences, MA Audubon -	Banding and Resighting AMOY on Monomoy NWR	2003	Ongoing	Banding program to contribute to cooperative efforts to investigate AMOY biology/ecology; band resighting conducted during fall AMOY staging counts	Data submissions to AOWG

	CWP					
MA	CUNY, NCF, TTOR, Mass Audubon	Mark-resight study of Massachusetts oystercatchers	2005	Ongoing	Banding of adult and juvenile AMOY on breeding grounds. Study area focuses on the islands of Massachusetts. Pre-through post-breeding resights conducted to investigate movement and estimate site fidelity.	Annual reports available; most recent – Murphy 2007. Dissertation, in prep.
MA	CUNY	Preliminary investigation of the population genetics of AMOY	2007	Ongoing	Employ molecular techniques to examine the level of genetic differentiation between geographically distinct populations along the Atlantic Coast in order to determine whether these populations exhibit any structure.	Dissertation in prep.
NJ	Rutgers, NJDFW	Mark-recapture study of breeding and wintering oystercatchers	2004	Ongoing	Banding of adult and juvenile oystercatchers on breeding grounds lead by Rutgers University. Band resighting on breeding grounds conducted annually by Rutgers and NJDFW. Limited banding and incidental resights of fall/winter birds by NJDFW. Additional band resights gathered through winter censuses.	Annual reports submitted to NJDFW – most recent Virzi 2007
VA	TNC, VDGIF, USFWS	Breeding banding program	2003	Ongoing	Banding program to contribute to cooperative efforts to investigate several aspects of AMOY biology.	Wilke 2004; Wilke and Watts 2004; Wilke 2005; Wilke and Boettcher 2007; Boettcher <i>et al.</i> 2007
VA	TNC, VDGIF, USFWS	Post-breeding re-sighting surveys	2004	Ongoing	Investigation of winter roost site use, roost fidelity and juvenile dispersal. Project involves repeated surveys of all known winter roost sites in Virginia's barrier island/lagoon system, August – December.	TNC, VDGIF, unpubl. data – annual submission to AOWG
NC	NC State University, NC Coop Unit, NPS	Methods trapping and banding breeding adult American Oystercatchers	2001	Complete	We created a modified Bal-chatri type trap that utilized a remote controlled mechanical decoy to attract territorial adults to a noose carpet. This trapping method minimized nest disturbance and increased trapping success rates.	McGowan and Simons 2005
NC	NC State University, NC Coop Unit, NPS	Resighting sub-adult oystercatchers banded as chicks	2002	Ongoing	We have banded a number of chicks in coastal North Carolina, and have either recaptured or resighted several birds returning to the natal areas as subadults 2 or 3 breeding season after hatching. These observations were made incidentally to other ongoing banding and monitoring projects.	McGowan et al. 2005b
NC	NC State Coop Unit, NCWRC, Audubon	Winter resight surveys of banded birds on winter roosts	2004	Ongoing	Winter resight surveys of major roost areas in the Beaufort and Cape Fear estuaries.	Simons et al. 2008a and previous years
NC	NC State Coop Unit, NPS, Audubon	Mark-resight studies of adult and juvenile AMOY.	1999	Ongoing	Mark-resight studies of adult and juvenile AMOY were initiated in 1999 on Cape Lookout National Seashore and are on-going. >325 birds marked to date. A mark-resight database for all birds banded by the working group from 1999 to present (>1,300 individuals banded, >1000 resights) has been compiled and posted to the AMOY Working group web page created and maintained at NC State University.	Simons et al. 2008a and previous annual reports, McGowan et al. 2005, McGowan and Simons 2005. Working Group web page: (http://www.ncsu.edu/proj)

					Analyses of movement and survival data underway by several working group members.	ect/simonslab/AMOY/Research.htm)
SC	SCDNR, Clemson Univ., SC Coop Unit	Banding program	2001	Ongoing	Banding program to contribute to cooperative efforts to investigate several aspects of AMOY biology.	
SC	SCDNR, Clemson Univ., SC Coop Unit	Annual winter roost census	2001	Ongoing	Investigation of winter roost site use, roost fidelity and winter movement. Project involves repeated surveys of all known winter roost sites in Cape Romain Region.	
SC	SCDNR, Clemson Univ., SC Coop Unit	Adult survival estimate	2003	Ongoing	Investigation of adult survival. Project involves surveys of all known breeding territories in the Cape Romain region during April and May. Color banded adults are followed from year to year.	
GA	GADNR, Manomet	Non-breeding season mark and resight effort	2001	Ongoing	Banding program to contribute to cooperative efforts to investigate several aspects of AMOY biology/ecology.	Data submissions to AMOY Working Group
FL	AoF, FWC, FPKs, Audubon Chapters	Annual breeding surveys of the Florida Gulf Coast.	1980	Ongoing	Incidental observations.	Hodgson, Paul and Rachal. <i>In prep.</i>
FL	Leary	Annual winter roost census / band data collection	2005	Ongoing	Seasonal and Periodic AMOY roosts census, band data collection and photo documentation at sites in Nassau, Duval, Dixie and Levy counties, FL and Camden Co, GA	Data submission to: FWS, FWC, FNAI, NPS, AMOY Working Group
FORAGING/DIET STUDIES						
State	Partners	Project Title	Year Initiated	Project Status*	Project Description	Publications/Reports Citations**
NJ	Rutgers	Foraging studies during the breeding and non-breeding seasons	2006	Ongoing	Investigation of critical foraging areas/habitats/prey species throughout the annual cycle.	
SC	Clemson Univ., SC Coop Unit, SCDNR, Cape Romain NWR	Winter foraging ecology in Cape Romain	2006	Not completed	Investigations of foraging ecology on oyster reefs in the Cape Romain region during winter of 2006 and 2007	Masters thesis in prep.
SC	Clemson Univ., SC Coop Unit, SCDNR, Cape Romain NWR	Breeding season foraging ecology in Cape Romain	2007	Not completed	Investigations of foraging ecology on oyster reefs in the Cape Romain region during the 2007 breeding season	Masters thesis in prep.
SC	Clemson Univ., SC Coop Unit	Overwintering American oystercatcher population characteristics and space use	2002	Complete	Used capture, banding/resighting, and radio-telemetry techniques to gain information about overwintering oystercatcher morphology, movement, and habitat use on CRNWR	Peters, Ph.D. Dissertation, Clemson Univ. 2005
GA and	SC DNR, GA DNR, Clemson	Foraging and nutritional studies year round	2001	Ongoing		

SC	Univ., SC Coop Unit, University, St. Louis Zoo, St. Catherines Island Foundation, UC Davis School of Vet. Med.					
HEALTH ASSESSMENT STUDIES						
State	Partners	Project Title	Year Initiated	Project Status*	Project Description	Publications/Reports Citations**
GA and SC	St. Catherines Island Foundation, Clemson Univ., SC Coop Unit, SC DNR, GA DNR, UC Davis Vet School	The American Oystercatcher (<i>Haematopus palliatus</i>) - a bioindicator species for assessing ecosystem health along the Georgia and South Carolina coasts and barrier islands.	2001	Data analysis, prep for publication	Established baseline data for physical examination, morphometric measurements, clinical pathology, toxicology, reproductive physiology, microbiology, external and internal parasites, infectious diseases, nutritional parameters, and confirmation of sex with DNA technology in the AMOY in Georgia and South Carolina.	Final manuscript in prep.
PREDATOR RESEARCH, MONITORING OR MANAGEMENT						
State	Partners	Project Title	Year Initiated	Project Status*	Project Description	Publications/Reports Citations**
MA	Monomoy NWR	Predator management	1996	Ongoing	Predator monitoring and control conducted on refuge to benefit all beach nesting birds including AMOY	Unpublished results
NJ	NJDFW, Rutgers, USFWS, NPS	Annual Breeding Surveys	2003	Ongoing	Assessment of causes of nest failure (and brood loss where possible) and their impact on reproductive success included as part of annual breeding surveys of beach nesting portion of population (NJDFW, USFWS, NPS) and at selected major (study) sites across all habitats (Rutgers).	Annual reports submitted to NJDFW – most recent Virzi 2007
NJ	NJDFW, USFWS, NPS	Predator management	2004	Ongoing	Targeted mammalian predator management at selected beach nesting bird sites, inclusive of sites were AMOY nest.	
VA	TNC, VDGIF, USFWS	Assessment of predator management efforts through AMOY productivity monitoring	2002	Ongoing	Productivity monitoring on Virginia's barrier islands in order to assess the effectiveness of predator management as a strategy to enhance beach-nesting bird habitat.	Wilke 2004; Wilke and Watts 2004; Wilke 2005; Wilke and Boettcher 2007; Boettcher <i>et al.</i> 2007
VA	TNC, VDGIF, USFWS, Univ. of UT, VA Museum of	Science-Based Conservation Management on the Virginia Barrier Islands:	1998	Ongoing, but currently on hold.	To date, the following tasks have been completed or are still ongoing: monitoring of mammalian predator distribution and diversity on the Virginia barrier islands (ongoing); monitoring the effects of predator control on the abundance and nesting	Dueser <i>et al.</i> 2005; Keiss 2001; other manuscripts <i>in prep.</i>

	Natural History, USDA-Wildlife Services (WS)	Avian Habitat Restoration Through Predation Management			success of avian beach-nesting species (ongoing under another study); searched for physical evidence of mainland-to-island and island-to-island raccoon travel corridors (completed); examined level of predation on artificial nest scrapes and eggs to identify the full suite of predators impacting avian beach nesters and to quantify the overall intensity of predation (completed); examination of patterns of genetic connectivity among insular populations of raccoons (ongoing, but currently on hold); and an assessment of the potential of using estrogen-treated eggs to induce an aversion response in raccoons (ongoing, but currently on hold).	
VA	CCB, USFWS	Camera study	2005	Ongoing	An investigation of reproductive failures in American Oystercatchers on Fisherman Island National Wildlife Refuge	Watts <i>et al.</i> 2006
VA	TNC, VDGIF, USFWS, USDA-WS	Predator Management on Virginia's barrier islands	1970's	Ongoing	Mammalian predator management has been conducted on Assateague Island since the 1970's. Control efforts began to expand to other barrier islands in the late 1990's and today they are being carried out on all islands where ground predators and significant numbers of avian beach nesters are present. Prior to 2007, Avian predator control efforts on the barrier islands were confined to Assateague and Assawoman Islands where gulls, crows and grackles found inside or adjacent to piping plover breeding territories were and continue to be selectively removed. In 2007, WS began a gull control program on Fisherman Island.	Annual USFWS, TNC and VDGIF reports available; most recent Allaben 2007; Denmon and Hackney 2007; Daisey and Savage 2007.
NC	NC State Coop Unit, Audubon, NPS	Factors affecting AMOY nesting success and survival	1995	Ongoing	AMOY productivity monitoring began on South Core Banks, Cape Lookout National Seashore in 1995 and has continued and expanded annually. Productivity from >1,500 nests documented from 1995 to present. Effects of predation on nesting success summarized annually and in individual research publications.	Simons et al. 2008a and previous annual reports, McGowan and Simons 2006, McGowan et al. 2005, McGowan et al. 2005, McGowan 2004, Davis et al. 2001, Davis 1999.
NC	NC State Coop Unit, USGS Patuxent Wildlife Research Center, NPS	Raccoon (<i>Procyon lotor</i>) ecology on Cape Lookout National Seashore, North Carolina.	2007	Ongoing	An intensive study of the ecology of raccoons on South Core Banks, Cape Lookout National Seashore initiated in 2007. The study will document the ecology and population biology of raccoons and the response of the breeding AMOY population before and after an experimental 50% reduction of the raccoon population.	Simons et al. 2008b.
GA	UGA, USGS, NPS, GADNR	Effects of Human activity and predation on breeding American oystercatchers	2003	MS Thesis	Nest fate of all nesting attempts determined with continuous video recording on Cumberland Island National Seashore	Sabine, John B. III. 2005. University of Georgia
HUMAN DISTURBANCE STUDIES OR MANAGEMENT						
MA	Monomoy NWR	Human management	1996	Ongoing	Annually close nesting and staging areas for AMOY and other migratory birds to limit human disturbance; Comprehensive Conservation Plan (CCP) study conducted in 2005-2007 to examine shorebird abundance, distribution, and	CCP shorebird study results in progress

					response to public uses on Monomoy NWR	
NJ	NJDFW, USFWS, NPS	Beach Nesting Bird Project	2002	Ongoing	Starting in 2002, AMOY were specifically included in protection programs within state targeting beach nesting birds at all barrier island/beach strand sites (not inclusive of back-bay or marsh breeding sites). Primary strategies include fencing/posting of breeding sites to minimize human disturbance (pre-fencing at major sites), intensive monitoring and stewardship.	
NJ	Rutgers	Assessing the effects of human disturbance on breeding oystercatchers	2004	Complete	Detailed study of the effects of human disturbance on oystercatcher productivity, breeding behavior and nest site selection.	
NC	North Carolina State University, NC Coop Unit, NPS	Affects of human recreation on the incubation behavior and nest survival of American oystercatchers	2002	Complete	We used video monitoring to observe incubating oystercatchers responding to human recreational activity. We found that some forms of human recreation (i.e., ATV traffic) altered behavioral patterns which might be leading to lower nest survival.	McGowan and Simons, 2006, McGowan 2004
NC	NC State Coop Unit	Effects of human disturbance on AMOY nesting success	1995	Ongoing	AMOY productivity monitoring began on South Core Banks, Cape Lookout National Seashore in 1995 and has continued and expanded annually. Productivity from >1,500 nests documented from 1995 to present. Effects of human disturbance on nesting success summarized annually and in individual research publications.	Simons et al. 2008a and previous annual reports, Davis et al. 2001, Davis 1999.
SC	Clemson Univ., SC Coop Unit	Assessing the relative effects of predation and human disturbance risk on overwintering oystercatchers	2002	Complete	Study of American Oystercatcher vigilance behavior on CRNWR. A set of models was constructed based on 340 focal-animal samples and models revealed relationships among vigilance behavior, predator density, and boat activity.	Peters and Otis 2005

¹Ongoing = project will continue as long as needed and as long as funding and resources are available; Completed = project has been completed, including published reports and peer-reviewed papers;

Not completed = one or more project goals still need to be completed.

²Full citations are listed in Appendix A.

Table 1 (alternative version). Summary of monitoring and research projects throughout the range of the American Oystercatcher. More than one entry per cell indicates multiple projects that may or may not be related or multiple projects with different principal investigators. Publication/report citations are provided in Appendix A.

STATE	BREEDING SEASON SURVEYS	NON-BREEDING SEASON SURVEYS	PRODUCTIVITY MONITORING	BANDING/RE-SIGHTING STUDIES	FORGAGING/DIET STUDIES	HEALTH ASSESSMENT	HUMAN DISTURBANCE STUDIES/MANGT.	HABITAT REQUIREMENTS	PREDATOR RESEARCH / MANAGEMENT
MA	O (2002)		O (2002)	O (2003)			O (1996)		O (1996)
NJ	O (2003)	O (2002)	O (2003)	O (2004)	O (2006)	incidental	O (2002)	O (2004)	O (2004)
DE									
MD									
VA	O (2001)	O (1999)	C, O (2002)	O (2003)	P			O (2002)	C, O (1970's)
NC	O (1999), C (2002)	O (2004)	O (1995)	C (2001), O (1999)			C (2002), O(1999)	O (2003)	P, O (2007)
SC	O (2001)	O (1999), C (2002)	O (2006)	O (2001)	O (2001), C (2002)	C, O (2001)	C (2002)	C (2002)	
GA	O (1999)		C,O (2000)	O (2001)			C ,O (2000)		C (2003)
FL	O (1980)	O (1980)	O (1980)	incidental	O (1980)	incidental	O (1980)	O (1980)	

O = Ongoing

P = Planned

C = Completed

Parentheses indicate initiation of project

Appendix A – Full Citations for Publications/Reports Listed in Table 1

- Boettcher, R., C.A. Smith, and A.L. Wilke. 2007. 2007 Piping Plover, Wilson's Plover and American Oystercatcher Breeding Status in Virginia. Final report to the Virginia Department of Conservation and Recreation – Division of Natural Heritage, Wachapreague, VA. 24 pp.
- Croll, K. and R.A. Beck. 2001. Estimated reproductive status and population size of the American Oystercatcher along coastal Virginia. Final report to The Nature Conservancy – Virginia Coast Reserve, Nassawadox, VA. 16 pp.
- Davis, M.B. 1999. Reproductive success, status and viability of the American Oystercatcher (*Haematopus palliatus*). M.Sc. thesis, North Carolina State University, Raleigh, North Carolina, USA.
- Davis, M. B., T. R. Simons, M. J. Groom, J. L. Weaver, and J. R. Cordes. 2001. The breeding status of the American Oystercatcher on the east coast of North America and breeding success in North Carolina. *Waterbirds* 24:195-202.
- Dueser, R. D., N. D. Moncrief and J. D. Martin 2005. Science-based conservation management on the Virginia Barrier Islands: avian habitat restoration through predation management. 2004 Project Report to the Virginia Coast Reserve of the Nature Conservancy, Nassawadox, Virginia.
- Keišs, O. 2001. Mammalian predator distribution and abundance on the Virginia barrier islands in relation to breeding habitats of colonial birds. M.S. Thesis, Utah State University, Logan, Utah.
- McGowan, C. P. 2004. Factors affecting nesting success of American Oystercatchers (*Haematopus palliatus*) in North Carolina. Unpublished M. S. thesis, North Carolina State University, Raleigh, North Carolina.
- McGowan, C. P., T. R. Simons. 2005. Method for trapping breeding adult American Oystercatchers. *Journal of Field Ornithology* 76:46-49.
- McGowan, C.P., T.R. Simons, W. Golder, J. Cordes. 2005a. A comparison of American Oystercatcher reproductive success on barrier beach and river islands habitats in coastal North Carolina. *Waterbirds* 28(2):150-155.
- McGowan, C.P., S.A. Schulte, T.R. Simons. 2005b. Resighting of marked American Oystercatchers banded as chicks. *Wilson Bulletin* 117: 382-385.
- McGowan C.P. and T.R. Simons. 2006. Effects of human recreation on American Oystercatcher incubation behavior. *Wilson Journal of Ornithology* 118(4): 485 – 493.

- Nol, E., B. Truitt, D. Allen, B. Winn, and T. Murphy. 2000. A survey of wintering American Oystercatchers from Georgia to Virginia, U.S.A., 1999. Wader Study Group Bulletin 93:46-50.
- Peters, K.A. 2005. Shorebird and wading bird distribution, habitat use, and response to human disturbance at Cape Romain National Wildlife Refuge, South Carolina. Ph.D. Dissertation, Clemson University, Clemson, S.C., 211 pp.
- Peters, K.A. and D.L. Otis. 2005. Using the risk-disturbance hypothesis to assess the relative effects of human disturbance and predation risk on foraging American Oystercatchers. *Condor* 107:716-725.
- Peters, K.A. and D.L. Otis. 2007. Shorebird roost-site selection at two temporal scales: is human disturbance a factor? *Journal of Applied Ecology* 44:196-209.
- Sabine, J. B., J. M. Meyers, C. T. Moore, and S. H. Schweitzer. 2007. Effects of human activity of breeding American Oystercatchers, Cumberland Island National Seashore, Georgia, USA. *Waterbirds* 30: In Press.
- Sabine, J. B., S. H. Schweitzer, and J. M. Meyers. 2006. Nest fate and productivity of American Oystercatchers, Cumberland Island National Seashore, Georgia. *Waterbirds* 29: 308-314.
- Sabine, J. B., J. M. Meyers, and S. H. Schweitzer. 2005. A simple, inexpensive video camera setup for the study of avian nest activity. *Journal of Field Ornithology* 76:294-298.
- Sanders, F.J., T.M. Murphy, and M.D. Spinks. 2004. Winter abundance of the American Oystercatcher in South Carolina. *Waterbirds* 27: 83-88.
- Sanders, F.J., T.M. Murphy, M.D. Spinks, and J.W. Coker. 2008. Breeding season abundance and distribution of American Oystercatchers in South Carolina. *Waterbirds* 31: in press.
- Simons, T. R., S. A. Schulte, J. Cordes, and W. Golder. 2008a. American Oystercatcher Research and Monitoring in North Carolina 2007 Annual Report to the National Park Service. USGS cooperative fish and wildlife research unit, North Carolina State University. 58 pp.
- Simons, T.R., A. Waldstein, and A. O'Connell. 2008b. Raccoon (*Procyon lotor*) ecology on Cape Lookout National Seashore, North Carolina. 2007 Annual Report to the National Park Service. USGS cooperative fish and wildlife research unit, North Carolina State University. 21 pp.
- Virzi, T. 2005. Summary report for data collected in connection with the 2005 study of American Oystercatcher (*Haematopus palliatus*) breeding habitat requirements, nest success and causes of nest failure in New Jersey. Rutgers, The State University of New Jersey: 15 pp.

- Virzi, T. 2006. Summary report for data collected in connection with the 2006 study of American Oystercatcher (*Haematopus palliatus*) breeding habitat requirements, nest success and causes of nest failure in New Jersey. Rutgers, The State University of New Jersey: 12 pp.
- Virzi, T. 2007. Summary report for data collected in connection with the 2007 study of American Oystercatcher (*Haematopus palliatus*) breeding habitat requirements, nest success and causes of nest failure in New Jersey. Rutgers, The State University of New Jersey: 12 pp.
- Virzi, T. 2008. *In Prep.* Results of 2007 American Oystercatcher (*Haematopus palliatus*) breeding surveys in alternate habitat along the New Jersey coast. Rutgers, The State University of New Jersey.
- Watts, B. D., F. M. Smith and B. J. Paxton. 2006. An investigation of reproductive failures in American Oystercatchers on Fisherman Island National Wildlife Refuge. Center for Conservation Biology Technical Report Series, CCBTR-06-06. College of William and Mary, Williamsburg, VA. 28 pp.
- Wilke, A.L. and R.A. Beck. 2002. Annual surveys of American Oystercatchers on the coast of Virginia and reproductive success on Metompkin Island and Fisherman Island. Unpublished annual report to The Nature Conservancy Virginia Coast Reserve, Nassawadox, VA. 14 pp.
- Wilke, A. L. 2004. American Oystercatcher Productivity Monitoring and Banding on the Eastern Shore of Virginia: Year 2003 report. Center for Conservation Biology Technical Report Series. CCBTR-04-01. College of William and Mary, Williamsburg, VA, 26pp.
- Wilke, A. L. and B. D. Watts. 2004. American Oystercatcher Productivity Monitoring, Breeding Survey and Banding in Virginia 2004 report. Center for Conservation Biology Technical Report Series. CCBTR-04-09. College of William and Mary, Williamsburg, VA, 26 pp.
- Wilke, A.L. 2005. American Oystercatchers in Virginia: 2005 summary of monitoring and research activities on the Eastern Shore. The Nature Conservancy – Virginia Coast Reserve, Nassawadox, VA. 21 pp.
- Wilke, A.L., B.D. Watts, B. R. Truitt, R. Boettcher. 2005. Breeding season status of the American Oystercatcher in Virginia. *Waterbirds* 28(3): 308-315.
- Wilke, A.L. and R. Boettcher. 2007. 2006 Piping Plover and American Oystercatcher Breeding Status in Virginia. Final report to The Nature Conservancy and the Virginia Department of Game and Inland Fisheries, Nassawadox, VA. 19 pp.

Wilke, A.L., B.D. Watts, R. Boettcher, P.P. Denmon, and B.R. Truitt. 2008a. Investigation of American Oystercatcher Reproductive Rates on Barrier Islands in Virginia, USA. *Waterbirds in review*.

Wilke, A.L., D.F. Brinker, B.D. Watts, A.H. Traut, R. Boettcher, J.M. McCann, B.R. Truitt, and P.P. Denmon. 2008b. American Oystercatchers in Maryland and Virginia, USA: Status and Distribution. *Waterbirds in press*.