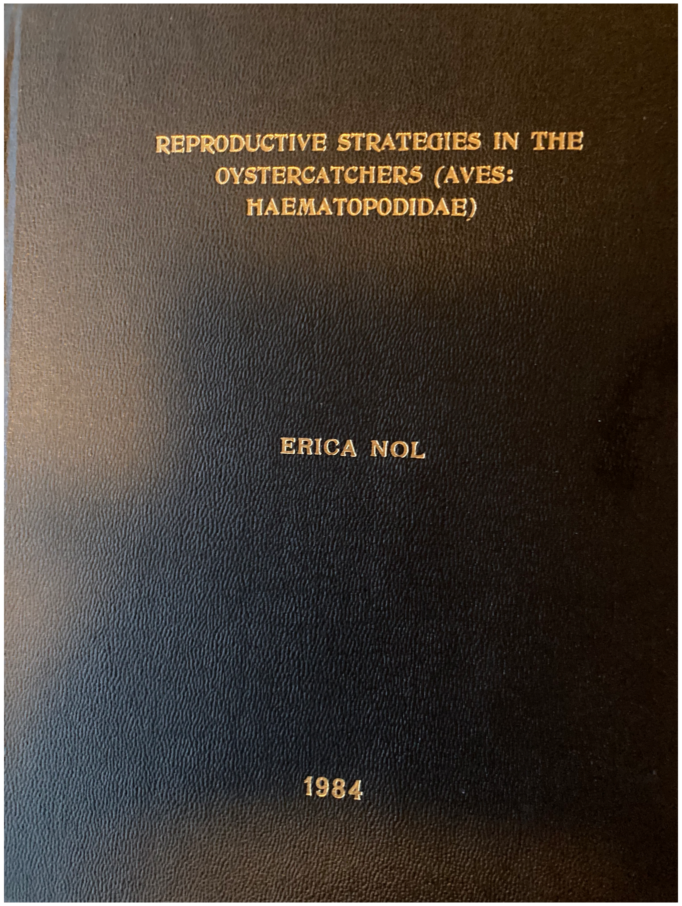
Looking back to where it all began (sort of..)



Erica Nol (enol@trentu.ca)
TRENT UNIVERSITY
Peterborough, ON, Canada

The two true initiators of the Virginia American Oystercatcher work

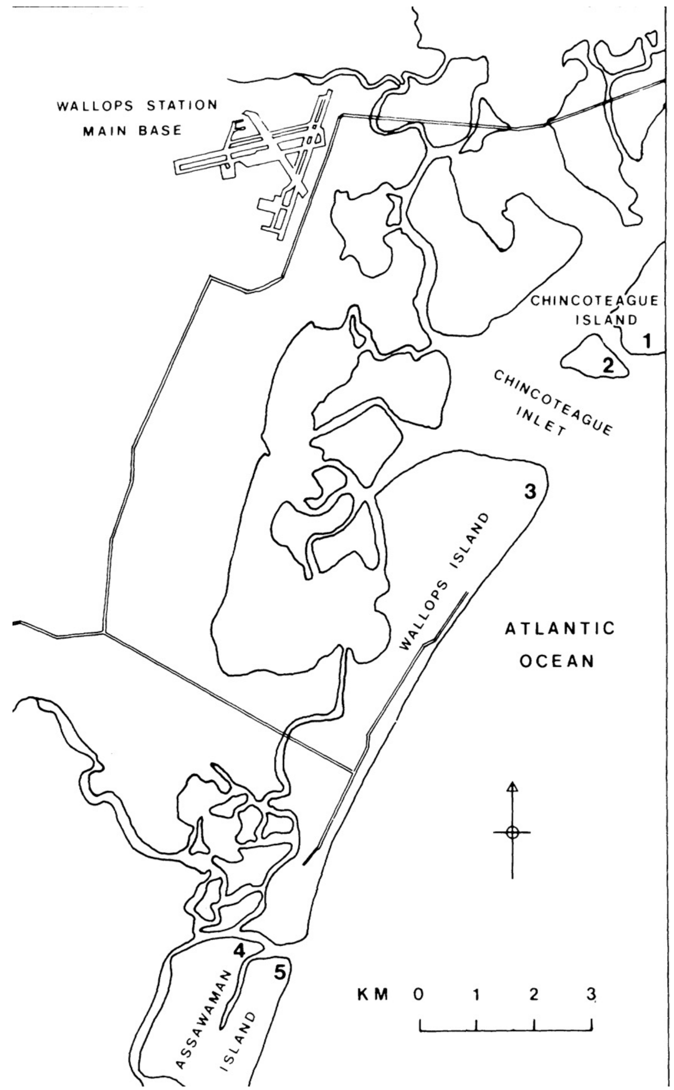
Allan J. Baker (1943-2014)

Mike Cadman: Coordinator of three Ontario Breeding Bird Atlasses

Field work conducted from 1981-1983 in Chincoteague Island, an islet, Wallops and Asswoman Island, Virginia.

Islands all were relatively undisturbed by humans.

Habitats included both (large and small) beaches and salt marsh pannes.



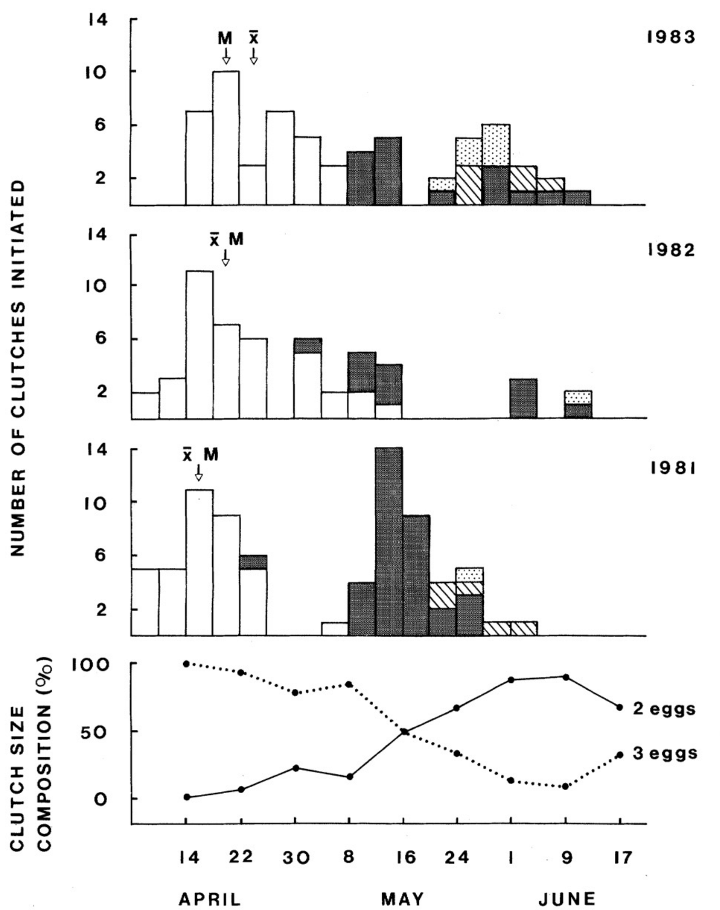
The world was a different place! Most biologists wanted to contribute to ECOLOGICAL THEORY, not necessarily Conservation Practise.

Thesis objectives included:

1) **Understanding basic phenology of the species in Virginia**

2) Understanding the partitioning of male and female roles in reproduction

3) Understanding the factors affecting the variety of life-history strategies in the solid black versus the pied oystercatchers.



Has phenology changed? A question that the AMOY working group can probably address!

TABLE 2. Egg dimensions (mean ± SE) of first, second, and third laid eggs of *H. palliatus* in Virginia.

	Egg sequence[1]			Eggs of unknown number
	1 (n = 116)	2 (n = 95)	3 (n = 69)	(n = 241)
Volume (cc)	41.68 ± 0.27[a]	43.22 ± 0.27[b]	42.28 ± 0.32[a]	42.34 ± 0.18
Length (mm)	56.05 ± 0.21[a]	57.09 ± 0.19[b]	56.95 ± 0.20[b]	56.31 ± 0.13
Breadth (mm)	39.46 ± 0.11[a]	39.82 ± 0.11[a]	39.43 ± 0.14[a]	39.68 ± 0.07
Weight (g)	47.69 ± 0.42[a]	49.65 ± 0.40[b]	47.72 ± 0.53[a]	49.30 ± 0.50

Second egg always larger!

$\propto$

Heavier and larger females produce larger eggs (mass-egg, r = 0.47, $P < 0.05$; structural size-egg, r = 0.51, $P < 0.025$, n = 19)

Further question: Does it matter!!?? That is do larger eggs have higher survival probabilities??

Thesis objectives included:

1) Understanding basic phenology of the species in Virginia

2) Understanding the partitioning of male and female parental roles

3) Understanding the factors affecting the variety of life-history strategies in the solid black versus the pied oystercatchers.

Nol 1985, Behaviour

SEX ROLES IN THE AMERICAN OYSTERCATCHER

by

ERICA NOL[1][2]
(Department of Zoology, University of Toronto, Ont., Canada, M5S 1A1)

(With 6 Figures)
(Acc. 15-IV-1985)

Introduction

Most species of birds are monogamous (WELTY, 1975; LACK, 1968). However, the quality and quantity of the contributions by each sex to parental care, often appear, or are assumed to be unequal (WILLSON & PIANKA, 1963; TRIVERS, 1972; ALEXANDER, 1974; ALCOCK, 1975; DAWKINS, 1976). TRIVERS' (1972) concluded that differential investment by each sex in their offspring was 'molded' from the initial differential

Typical bi-parental shorebirds but with a difference!

Provisioning young means some flexibility as the chicks do not necessarily need to have direct access to food!

General context:

"The inherent conflict between the sexes falls on a continuum of intensity ranging from those species where offspring are easily raised by one parent (no cooperation) to species where biparental care is required to raise the young (high degree of apparent cooperation). **TRIVERS (1972) termed the apparent cooperation as *'complementarity'* of sex roles."**

Observations of pairs of marked individuals for over 156 days

I predicted that apparent cooperation should be most developed during period when energy expenditure was greatest (during chick-rearing)

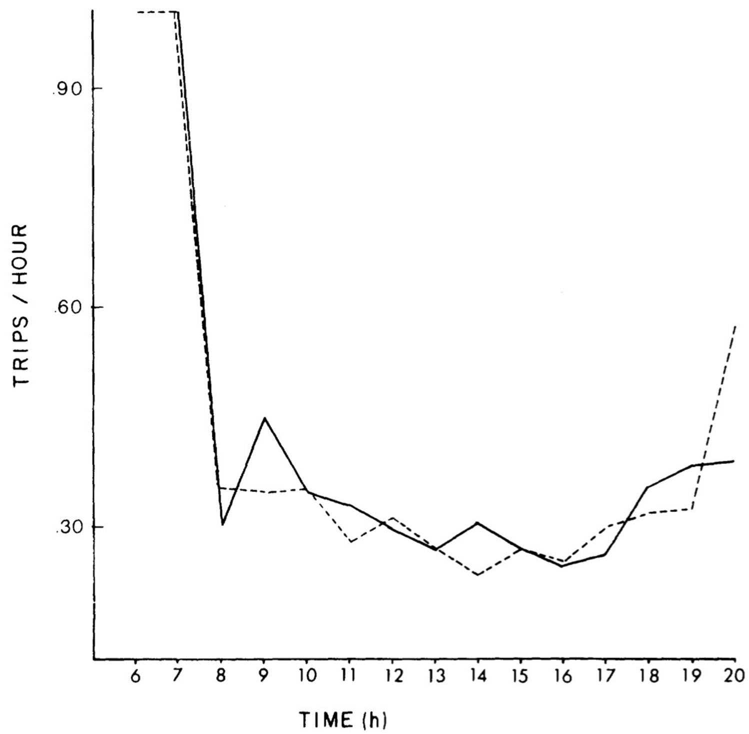


Fig. 2. Average hourly rates of foraging by males (solid lines) and females (broken lines) to provision the young. Time is based on a 24 h clock.

1. Both sexes made the most trips first thing in the morning, and pattern between the sexes was similar over the day. Males and females had similar rates of trips and similar lengths.

2. No real evidence for conflict except males waited longer to take a trip after a female returned than the opposite pattern. Provisioning trips were every 10-15 minutes

Prediction of **high correlation in territorial behaviour if cooperative both early and late,** and in response to predators/conspecifics during early chick-rearing when each benefits, but lower later when there might be less of a cost of lack of cooperation.

TABLE 9. Spearman rank correlation coefficients within pairs of the American oystercatcher on the incidence of territorial and anti-predator behaviour during incubation, and early and late chick-rearing stages

Activity		Incubation (n = 133)	Early chick-rearing (n = 117)	Late chick-rearing (n = 85)
Bobbing	*r*	0.35	0.55	0.75
	P	0.001	0.0001	0.0001
Piping (sec)	*r*	0.21	0.70	0.81
	P	0.014	0.0001	0.0001
Number of piping displays	*r*	0.18	0.60	0.73
	P	0.036	0.0001	0.0001
Chasing non-conspecifics	*r*	−0.09	0.38	0.46
	P	n.s.[1])	0.0001	0.0001
Chasing conspecifics	*r*	0.04	0.41	0.31
	P	n.s.	0.0001	0.0043
Chased by conspecifics	*r*	0.00	0.40	0.22
	P	n.s.	0.0001	0.0441
All chases	*r*	0.10	0.27	0.27
	P	n.s.	0.0037	0.0134

Growth rates: These were similar in broods of different sizes as were provisioning rates. During my field season I observed many chicks rejecting food offerings, suggesting that food was not limiting.

Brood size (# of chicks)	Provisioning rates	Asymptotic mass (g) of chicks
1	2.00 +- 0.22	400
2	1.83 +- 0.14	400
3	1.64 +- 0.24	385

Nol 1989, Condor

Concerns over poor nest success and what factors impacted territory quality.

JOURNAL ARTICLE

Approaches to the Conservation of Coastal Wetlands in the Western Hemisphere

Keith L. Bildstein, G. Thomas Bancroft, Patrick J. Dugan, David H. Gordon, R. Michael Erwin, Erica Nol, Laura X. Payne and Stanley E. Senner

The Wilson Bulletin
Vol. 103, No. 2 (Jun., 1991), pp. 218-254 (37 pages)

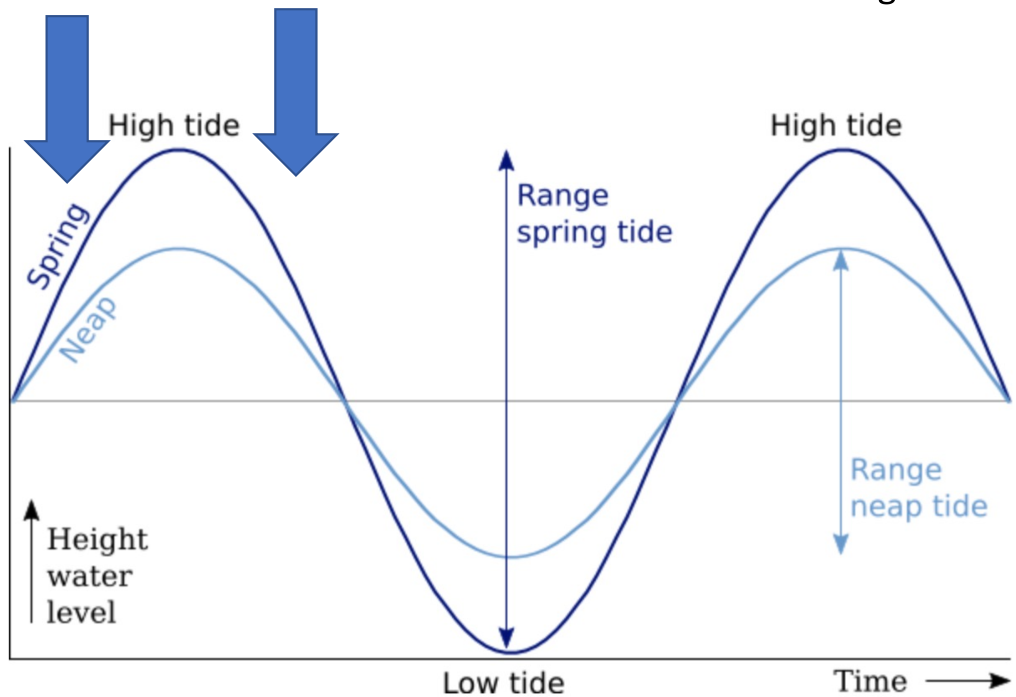
Published by: Wilson Ornithological Society

‹ Previous Item | Next Item ›

Stable URL ⓘ

https://www.jstor.org/stable/4163006

Came from views of repeated flooding events for some birds: Modelled nest success as a function of timing.



Prediction even in the early 1990’s was for more frequent storms and that this would spell trouble for coastal nesting species

Does nesting habitat quality relate to reproductive performance?

Correlations:

Larger nearby feeding area led to **earlier** egg laying, **larger** eggs and **higher** fledging success (both in one year and over the three).

Correlations ranged from ***0.50 to 0.53***, so certainly not all variance explained.

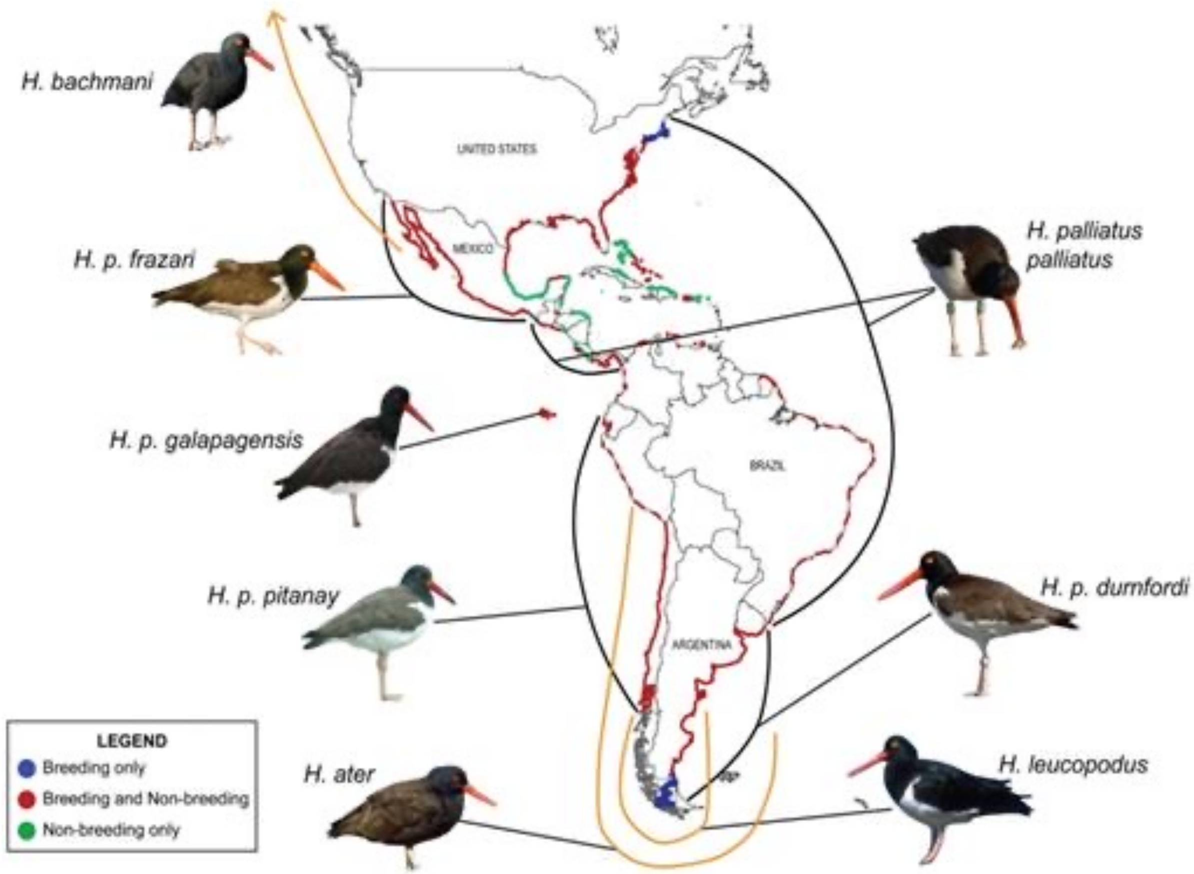
Nol 1989, Condor

1) Understanding basic phenology of the species in Virginia

2) Understanding the partition of male and female parental roles

3) **Understanding the factors affecting the variety of life-history strategies in the solid black versus the pied oystercatchers.**

What factors affect oystercatcher life-history strategies?



Simons 2017

General features of the two colour morphs

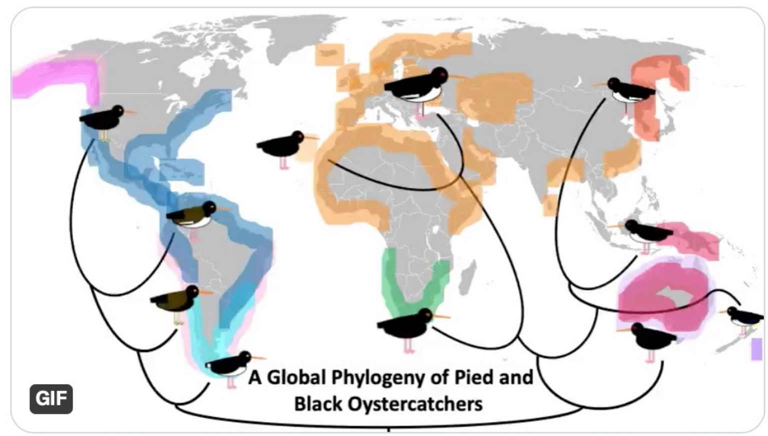
	Pied Oystercatchers	Black Oystercatchers
Clutch sizes	2-4 (mostly 3)	2 (sometimes 3)
Body sizes	Slightly smaller (< 650 g)	Slightly larger (> 650 g)
Resident or migratory	Migratory	Resident
Rocky or sandy shorelines	Sandy	Rocky shore
Adult survival estimates	Lower	Higher
Cllutch size/body mass	Higher	Lower

Patterns: Phil Hockey (1996). *Haematopus ostralegus* in perspective: comparisons with other oystercatchers, ***in***: Goss-Custard, J.D. (Ed.) *The oystercatcher: from individuals to populations. Oxford Ornithology Series,* : pp. 251-285

Genetics: Tess ? from University of Aberdeen, Scotland. Reported at #ISTC20

Tess @penguin_tereza · Oct 8, 2020 ···

1 **#ISTC20** #Sesh9 **Oystercatchers** are a genus of globally distributed #waders with eleven extant species. Their morphologies and ecologies are so similar that their interspecific relationships and evolutionary history have become a web of taxonomic reclassifications. #ornithology



2 56 174

Punta Tombo: Breeding area for *H. palliatus durnfordi* and *H. ater*, wintering area for *H. leucopodus*

H. palliatus durnfordi fed chicks partially from rocky shores, so exhibited an intermediate life-history. Also had a smaller clutch size and was mostly non-migratory.

Photo D. Adult American Oystercatcher with two young chicks in Argentina (photo: Ramon Moller Jensen).

Photo D. from: Clay et al. 2014, Int'l Wader Studies 2014

And then, there was the concern over conservation of AMOY!

The U.S. Shorebird Conservation Partnership

Building Collaborative Action for Shorebird Conservation

HOME | U.S. PLAN & COUNCIL | REGIONAL PLANS | SCIENCE | HABITAT | EDUCATION | INTERNATIONAL | HUNTING

MEETING MINUTES

POSITION LETTERS

Plan Overview

Partners from state and federal agencies and non-governmental organizations from across the country pooled their resources and expertise to develop a conservation strategy for migratory shorebirds and the habitats upon which they depend. The U.S. Shorebird Conservation Plan provides a scientific framework to determine species, sites, and habitats that most urgently need conservation action. Main goals of the plan, originally completed in 2000, are to ensure that adequate quantity and quality of shorebird habitat is maintained at the local level and to maintain or restore shorebird populations at the continental and hemispheric levels. Separate technical reports were developed for a conservation assessment, research needs, a comprehensive monitoring strategy, and education and outreach. These national assessments were used to step down goals and objectives into 11 regional conservation plans. Many of the Migratory Bird Joint Venture Implementation Plans now address shorebird habitat needs and represent a second generation of regional plans for shorebird habitat conservation.

American Avocet. Photo courtesy of Bradford Winn.

Partnership Council

In 2001, at a meeting of the Waterbird Society in Niagara Falls, ON, the AMOY working group was formed!

SPECIES	BINOMIAL NAME	POPULATION ESTIMATE	CONFIDENCE	TENTATIVE TARGET	PROPOSED ACTION
American Oystercatcher	*Haematopus palliatus*	7,500	Moderate	?	Coastal beach nesting habitat greatly reduced and at risk; monitor pop. to determine population trends.

Survey results

1) Boat, truck and helicopter (GA only) based (1999-2000, Nol et al. 2000): about 9000 individuals

2) Aerial-based in winter and corrected for detection probability using aerial photographs (2002-2003; Brown et al. 2005): Nearly 11,000 birds.

3) Repeated aerial survey (NY to Texas) (2013; Brown et al. in Simons 2015): 11,000 birds.

Therefore, with real data the species was lifted out of the ‘danger’ zone, but the initial estimate spurred on research and cooperation on this species across its range.

A global assessment of the conservation status of the American Oystercatcher *Haematopus palliatus*

Robert P. Clay[1], Arne J. Lesterhuis[1], Shiloh Schulte[2], Stephen Brown[3], Debra Reynolds[4] & Theodore R. Simons[5]

[1]BirdLife International, Gaetano Martino 215 esq. Teniente Ross, Asunción, Paraguay. rob.clay@birdlife.org; arne_j_lesterhuis@yahoo.co.uk
[2]Manomet Center for Conservation Sciences, 18 Park Street, Kennebunk, Maine 04043, USA. sschulte@manomet.org
[3]Manomet Center for Conservation Sciences, P.O. Box 1770, Manomet, Massachusetts 02345, USA. sbrown@manomet.org
[4]U.S. Fish & Wildlife Service, Northeast Regional Office, 300 Westgate Center Drive, Hadley, Massachusetts 01035-9589, USA. debra_reynolds@fws.gov
[5]U.S. Geological Survey, North Carolina Cooperative Fish and Wildlife Research Unit, Department of Applied Ecology, Campus Box 7617, North Carolina State University, Raleigh, North Carolina 27695-7617, USA. tsimons@ncsu.edu

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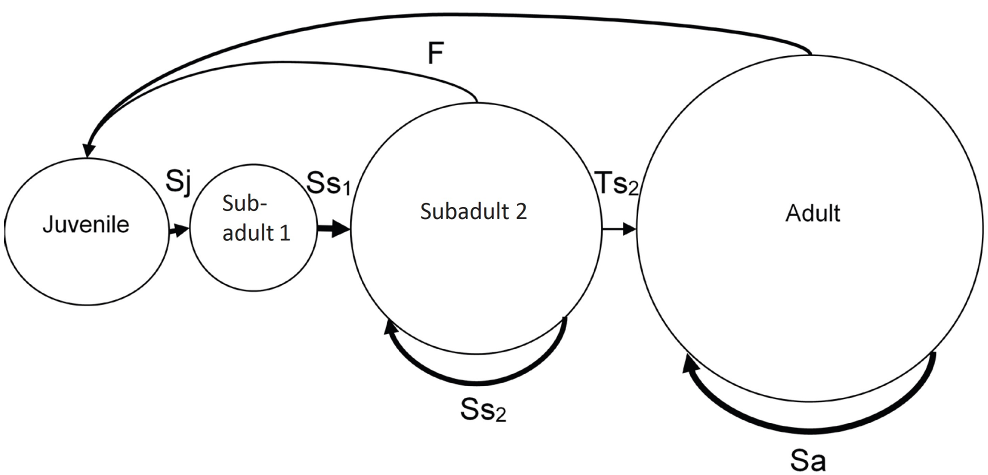
Clay et al. 2014, International Wader Studies

A survival estimate from resighting data from 1978-1980 *(Nol, Murphy and Cadman 2012)*

Habitat	Survival	Resighting
Marsh nesting	0.94 (0.85-0.98)	1.00
Beach nesting	0.81 (0.67-0.90)	1.00

Other estimates have been used in demographic models (Shulte 2012, Felton 2018) with estimates of breeding and wintering populations remarkably consistent with the model inputs.



In this model Sa was estimated to be**)**
0.92 (Murphy 2010)

Figure from Simons 2017

Theses on American Oystercatchers pre-2001

Lauro, B. (1986). Nest site selection of American Oystercatchers (*Haematopus palliatus*) in salt marshes. (Masters Thesis), Rutgers University, New Brunswick, New Jersey.

Humphrey, R.C. (1988). Ecology and Range Expansion of American Oystercatchers in Massachusetts. (Masters Thesis), University of Massachusetts, Amherst, Massachusetts.

Novick, J. S. (1996). An analysis of human recreational impacts on the reproductive success of American Oystercatchers (Haematopus palliatus): Cape Lookout National Seashore, N.C., (Masters Thesis), Duke University, Durham, North Carolina.

Tuckwell, J. (1996). The flexibility in foraging behaviour of the American Oystercatcher (*Haematopus palliatus*) in winter. (Masters Thesis), Trent University

Davis, M. B. (1999). Reproductive success, status and viability of the American Oystercatcher *(Haematopus palliatus). (*Masters Thesis), North Carolina State University.

Theses since US Conservation Plan: 8 Masters theses, 5 Ph.D. theses. Six universities, seven states.

McGowan, C. P. (2004). *Factors affecting nesting success of American Oystercatchers (Haematopus pallitus) in North Carolina.* (Masters Thesis). North Carolina State University.

Sabine, J. B. III (2005). Effects of human activity and predation on breeding American Oystercatchers. (Masters Thesis). University of Georgia, Athens, Georgia.

Hand, C. (2008). *Foraging ecology of American Oystercatchers in the Cape Romain Region, South Carolina*. (Masters Thesis). Clemson University.

Virzi, T. (2008). *Effects of urbanization on the distribution and reproductive performance of the American oystercatcher (Haematopus palliatus palliatus) in coastal New Jersey*. (Doctoral Dissertation). Rutgers University

Wilke, A. L. (2008). Status, Distribution and Reproductive Rates of American Oystercatchers in Virginia. (Masters thesis). William & Mary College.

Murphy, S. P. (2010). *Population dynamics of the American Oystercatcher (Haematopus palliatus) near the northern limit of its range.* (Doctoral Dissertation). City University of New York, New York, New York.

Collins, S. (2012). *Reproductive ecology of American Oystercatchers in the Cape Romain region of South Carolina: implications for conservation.* (Masters Thesis). Clemson University

Stocking, J. J. (2012). *Effects of predator control and habitat type on American Oystercatcher (Haematopus palliatus) reproductive success.* (Masters Thesis). North Carolina State University.

Schulte, S. A. (2012). *Ecology and population dynamics of American Oystercatchers (Haematopus palliatus)*. (Doctoral Dissertation). North Carolina State University

Borneman, T. E. (2013) *Effects of human activity on American Oystercatchers (Haematopus palliatus) breeding at Cape Lookout National Seashore.* (Masters Thesis) North Carolina State University.

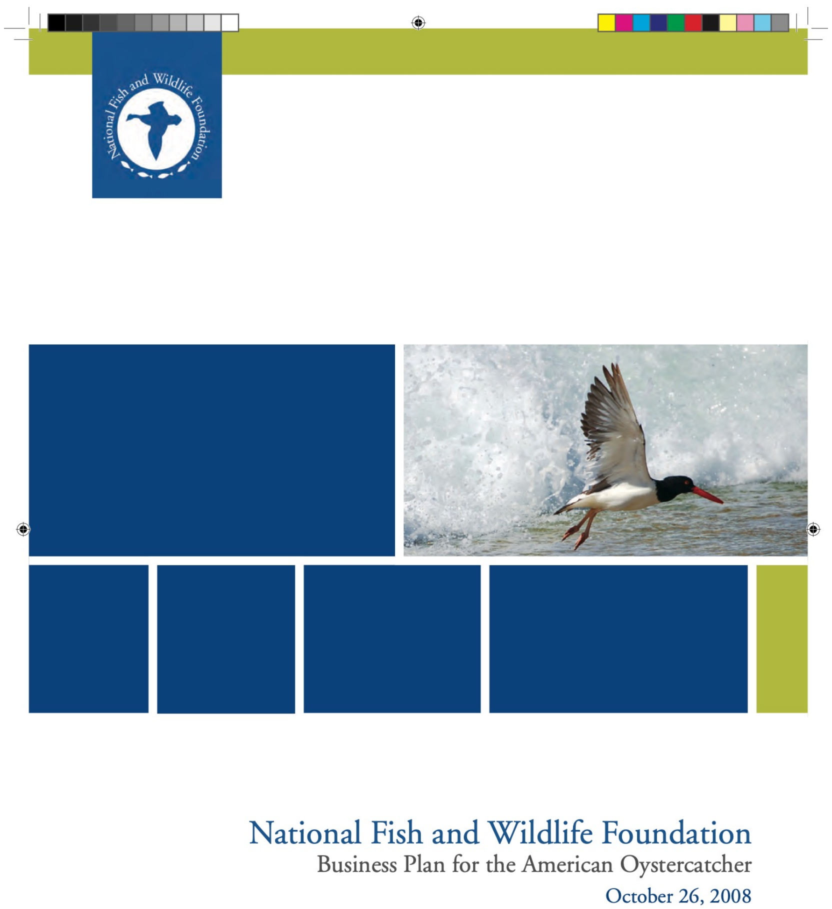
Munters, A. E. (2014). *Nest site selection of American Oystercatchers (Haematopus palliatus) on the Upper Texas Coast with comments on field sexing techniques*. (Masters Thesis). Texas State University – San Marcos.

George, R. C. (2014). *Reproductive ecology of the American Oystercatcher (Haematopus palliatus) in Georgia*. (Master's Thesis). University of Georgia.

Felton, S. K. (2018). *Investigating acute and long-term effects of management actions on American Oystercatcher populations*. (Doctoral Dissertation). North Carolina State University.

Sterling, A. V. (2018). *Modeling productivity for American Oystercatchers (Haematopus palliatus) and Wilson's plovers (Charadrius wilsonia) in a highly dynamic environment*. (Doctoral Dissertation). University of Georgia.

First species to have its own ‘Business Plan’



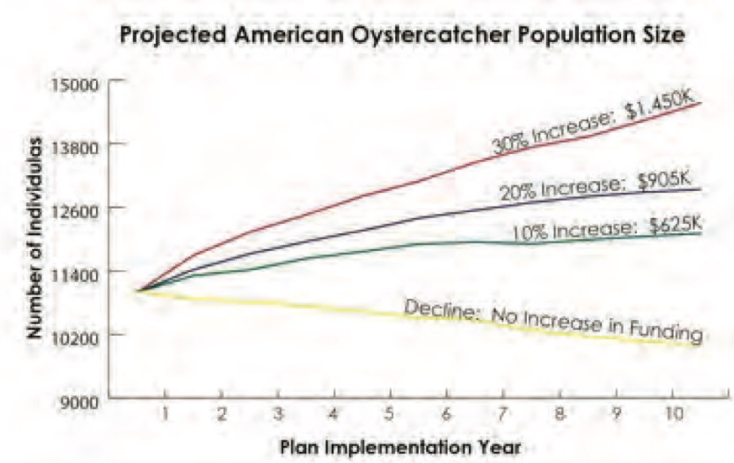


Figure 1. Expected changes in American Oystercatcher population size on Atlantic and Gulf coasts with various levels of targeted financial investment over a 10-year period.

Culmination of the first 15 years of the AMOY working group: Symposium at Waterbirds Society annual meeting in Bar Harbour, ME and a SPECIAL PUBLICATION of the Journal Waterbirds (2017)

WATERBIRDS

JOURNAL OF THE WATERBIRD SOCIETY

VOL. 40 SPECIAL PUBLICATION 1 PAGES 1-126

The American Oystercatcher (*Haematopus palliatus*) Working Group: 15 Years of Collaborative Focal Species Research and Management

THEODORE R. SIMONS

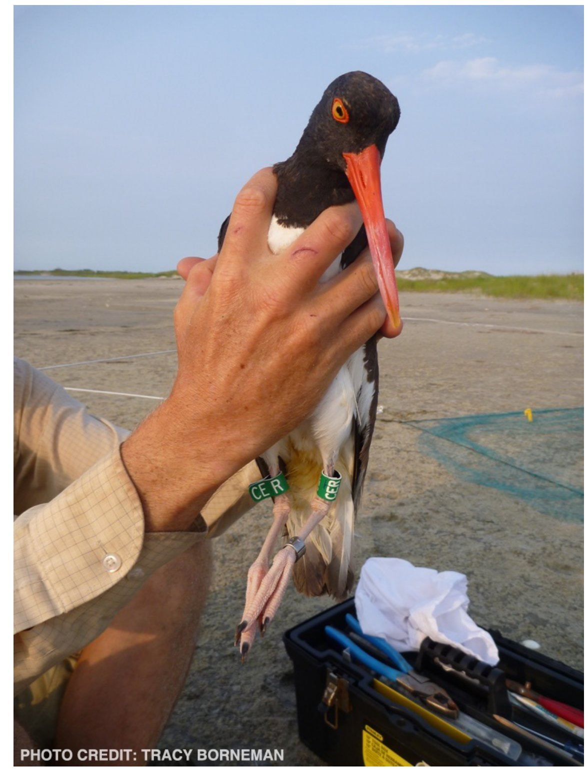
Major Accomplishments of American Oystercatcher Working Group (as of 2017)

(1) Over 30 institutions and organizations have participated in the AMOY working group

(2) Active list-server with > 150 members.

(3) Portal for banding resight data set (including coordinated banding protocols)

(4) Meetings held annually from Maine to Texas (including two virtual meetings)



Major Accomplishments of American Oystercatcher Working Group (as of 2017)

(4) As of 2017 there were 25 published papers plus numerous reports (and the theses mentioned previously)

(5) Major symposium organized (2015) in Bar Harbour, ME which included colleagues from Mexico.

(6) Identifying that threats to AMOY also threaten other beach-nesting birds so conservation of AMOY results in conservation of many other species (an ’umbrella’ species?)

(7) Recognized as conservation leaders!

(8) Expanded to include all of the H. palliatus sub-species!

American Oystercatcher

Haematopus palliatus

LC Least Concern | Names (34) | Subspecies (2)

American Oystercatcher Working Group, Erica Nol, and Robert C. Humphrey

Version: 1.0 — Published March 4, 2020

Text last updated May 25, 2012

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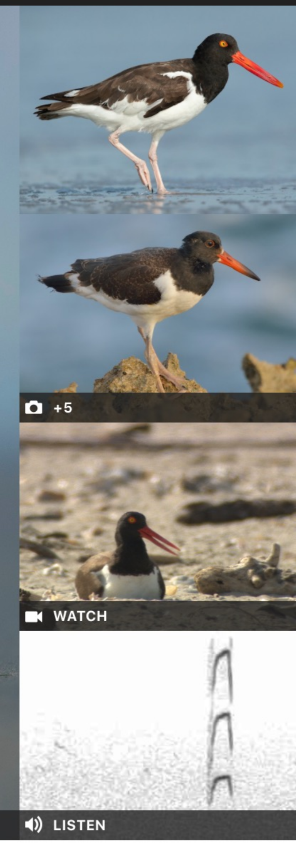


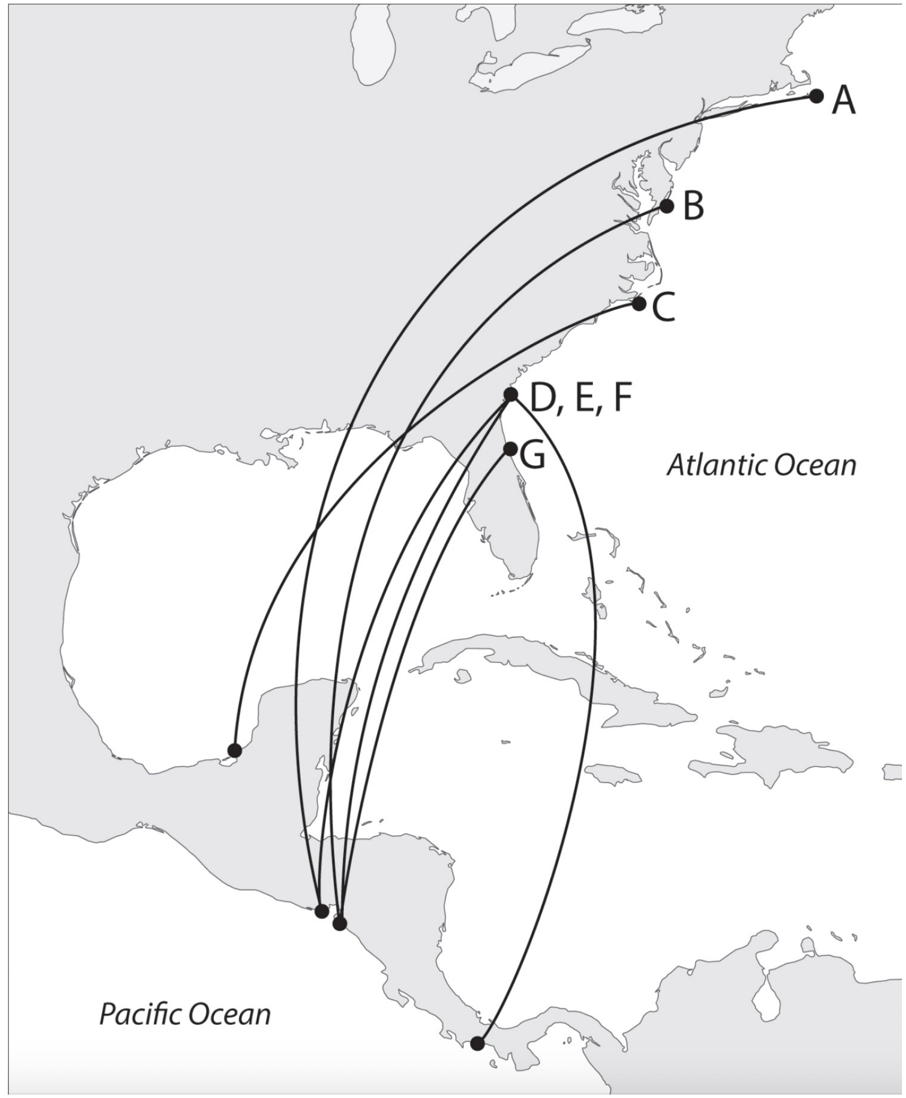
The American Oystercatcher is a large, conspicuous shorebird, common in coastal salt marshes and along sand beaches throughout the central part of its range. One of the few birds to specialize on bivalve mollusks living in saltwater, this species is completely restricted to marine habitats. Two races breed in North America—the eastern nominate race along the Atlantic coast from southern Maine south, and a second race along the Pacific

Insights from banding studies:

Regular resightings of birds in Panama, Honduras, Mexico and Nicaragua

Also, within season movements can be quite extensive.

Substantial site-fidelity to non-breeding locations (e.g., Black GF resighted in Nicaragua 2012, 2014, 2016



From Simons 2017 (Waterbirds)

Banding data summarized to examine migratory connectivity and adult survival of migratory and resident populations (Murphy et al. 2017)

From that study, detections remain high even though over broader area (> 20 km) and adult survival rates did not vary among migratory and resident populations.

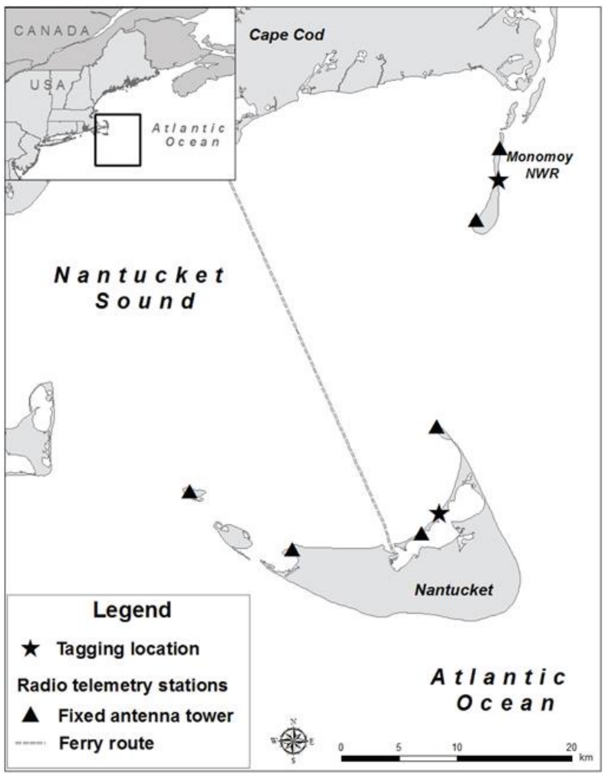
	Survival		
Year	*S*	SE	CI
2005	0.938	0.014	0.906-0.960
2006	0.927	0.013	0.898-0.948
2007	0.913	0.011	0.889-0.932
2008	0.897	0.010	0.876-0.915
2009	0.879	0.010	0.857-0.897
2010	0.857	0.014	0.828-0.883
2011	0.833	0.021	0.787-0.871

Resighting rates variable by mostly > 50%

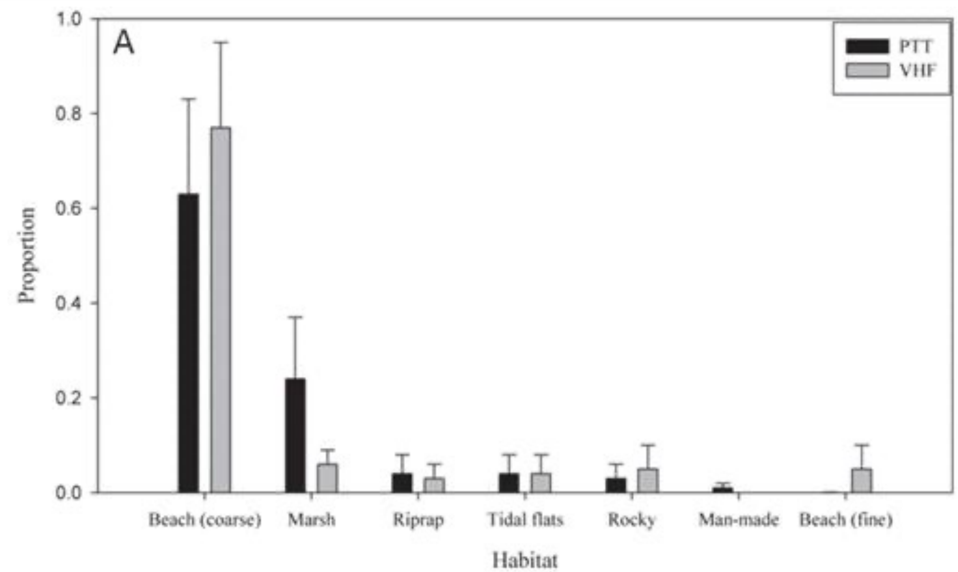
Massachusetts Nonbreeding Detection			New Jersey Nonbreeding Detection			South Carolina Nonbreeding Detection		
R_{MA}	SE	CI	R_{NJ}	SE	CI	R_{SC}	SE	CI
0.599	0.102	0.393-0.774	0.727	0.140	0.401-0.914	0.542	0.080	0.386-0.690
0.717	0.063	0.581-0.822	0.556	0.116	0.334-0.758	0.476	0.062	0.358-0.596
0.763	0.052	0.647-0.850	0.708	0.097	0.492-0.858	0.600	0.062	0.475-0.713
0.726	0.056	0.604-0.821	0.851	0.054	0.712-0.929	0.158	0.042	0.092-0.259
0.337	0.060	0.232-0.462	0.850	0.051	0.721-0.925	0.694	0.054	0.580-0.789
0.543	0.065	0.416-0.665	0.696	0.061	0.566-0.800	0.606	0.060	0.486-0.715
0.723	0.065	0.581-0.831	0.853	0.047	0.737-0.924	0.644	0.060	0.521-0.751

Murphy et al. 2017

Length of stay at two Massachusetts breeding locations (Loring et al. 2017)



			Unique Days		Length of Stay		Last Date in Study Area	
ID	Capture Site	Capture Date	PTT	VHF	PTT	VHF	PTT	VHF
68	Nantucket	5/16/13	52	9	90	83	8/14/13	8/07/13
69	Nantucket	5/17/13	62	47	115	111	9/09/13	9/05/13
70	Nantucket	5/16/13	46	28	95	90	8/19/13	8/14/13
71	Monomoy	6/5/13	71	10	142	112	10/25/13	9/25/13
72	Monomoy	6/5/13	73	57	146	145	10/29/13	10/28/13



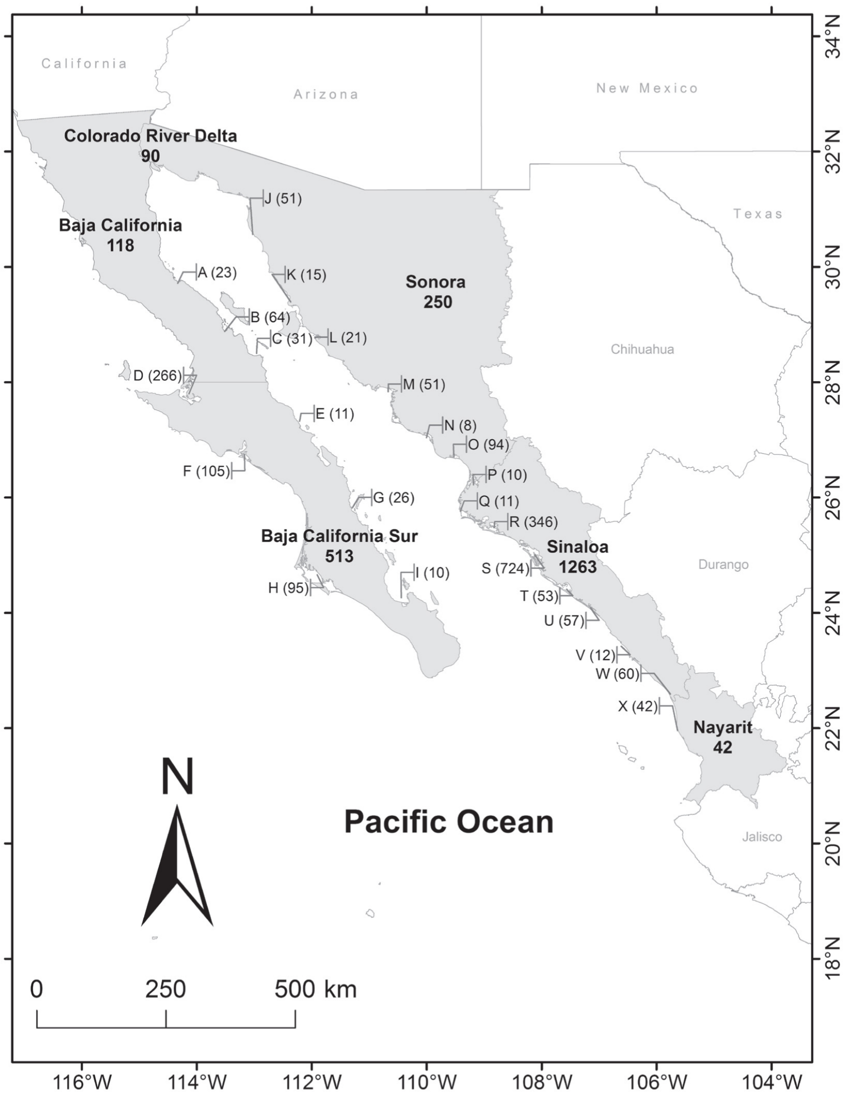
AMOY in Mexico (H. p. frazari)

Widespread as a breeder on coast of Baja California and on the east coast of the Sea of Cortez (all 5 states of NW Mexico).

Most are nesting on islands (80%+)

More than 2200 birds counted (much larger than previously assumed)

Conservation efforts underway because, although large, many threats.



Pacacios et al. 2017.

In summary:

The AMOY Working Group is not going anywhere!

There is still a surprising amount to discover about this species (e.g., recruitment rates, presence of dominance hierarchies, lifetime reproductive success, density-dependent processes, spatial use across the annual cycle, wintering ecology especially outside eastern NA range, and others).

AMOY are clearly an excellent species for training students in coastal ecology and avian conservation

Thanks!

To the American Oystercatcher Working Group including all the students, government and NGO scientists and the general public, who have done so much for this species.