

Headstarting: An Experimental Study to Improve Nest Success of American Oystercatchers

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POPULATION ESTIMATES

- Surveys and research conducted in South Carolina
 - breeding – ~400 breeding pairs/ ~380 non-breeding individuals

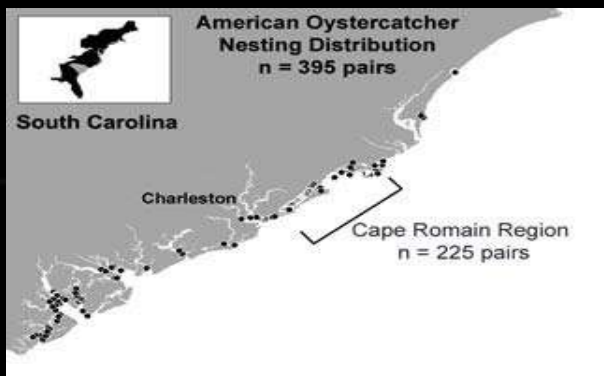
(Sanders *et al.* 2008)

- wintering – 3,500 individuals

(Sanders *et al.* 2004)



- Cape Romain Region (CRR) supports a majority of South Carolina's breeding pairs and non breeding flocks



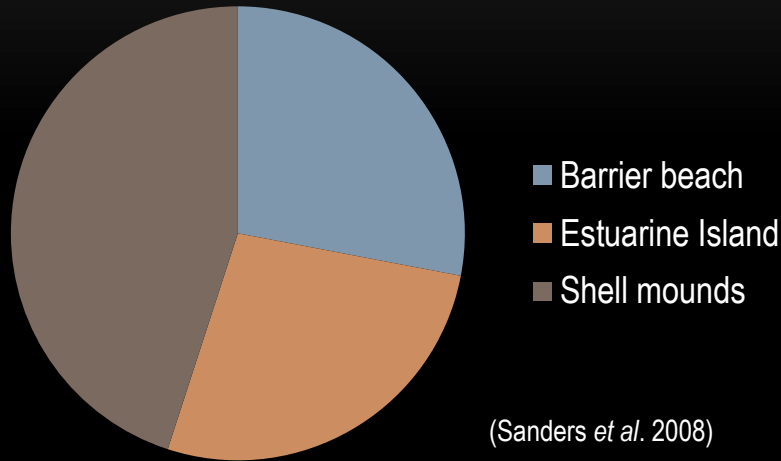
CAPE ROMAIN NWR

- 35 km segment of the southeast Atlantic coast
- Expanse of barrier islands, salt marshes, intricate coastal waterways, long sandy beaches, fresh and brackish water impoundments, and maritime forest
- Objectives = to preserve in public ownership habitat for waterfowl, shorebirds and resident species



RESEARCH WITHIN THE CAPE ROMAIN REGION

- AMOY breeding distribution in South Carolina:



(Sanders *et al.* 2008)



- Reproductive success can be low and highly variable among years

(Thibault 2008)

- Two major factors negatively affecting reproductive success

- flooding (boat wakes, high tides)
- predation



STUDY OBJECTIVES

- **Determine whether or not headstarting improves hatch and fledge success**
- Measure reproductive success of AMOY nesting within the Cape Romain Region
- Identify and quantify factors affecting nest and chick survival in oystercatchers



PRIMARY STUDY AREAS



- Shell rakes along the Atlantic Intracoastal Waterway (AICW) from marker 67-97
- Shell rakes in Southwest Bulls Bay (SWBB) from Venning Creek to Bulls Creek



ATLANTIC INTRACOASTAL WATERWAY (AICW)

- 3,000 miles
- Boston, MA to Key West, FL
- Commercial and recreational traffic
- Shell rakes formed by boat wakes



SOUTHWEST BULLS BAY (SWBB)



- Shell rakes formed at edges of marsh by wind and tide
- Emergent oysterbeds
- Adjacent to AICW



NEST MONITORING



- Shell rakes searched and nests checked every 4 days on average (range 0-10 days)
- Overwash cups placed ~1m from scrape
- Cameras set up on control nests in SWBB in 2011
- All nests monitored until failed or successful (chicks fledged)

HEADSTARTING METHODS

- Collect partial clutches from every other nest
- Label eggs to identify site and nest number
- Fake wooden eggs secured in scrape
- Leave one real egg in nest scrape
- Place collected eggs in cabinet incubator (37.4C, 60% RH)
- Chicks returned to nest after hatch
- Verify adults accept chick



METHODS - CHICK SURVIVAL

- 1.3g transmitters attached to chicks
- Chicks located and measured ~4 days
- Chicks were considered “fledged” at 35 days or when observed in flight



HEADACHES AND SOLUTIONS

2010

- Nail anchoring system for fake eggs
- Incubator settings 37.7C, 50% RH - deformities
- Abandon fake eggs
- Overwash burying scrape and shell rake
- Four pair did not accept chicks

2011

- 18" piece of rebar nailed into scrape
- Settings at 37.4C, 60% RH – no deformities
- No change
- Elongate string attached to fake eggs
- All pairs accepted chicks

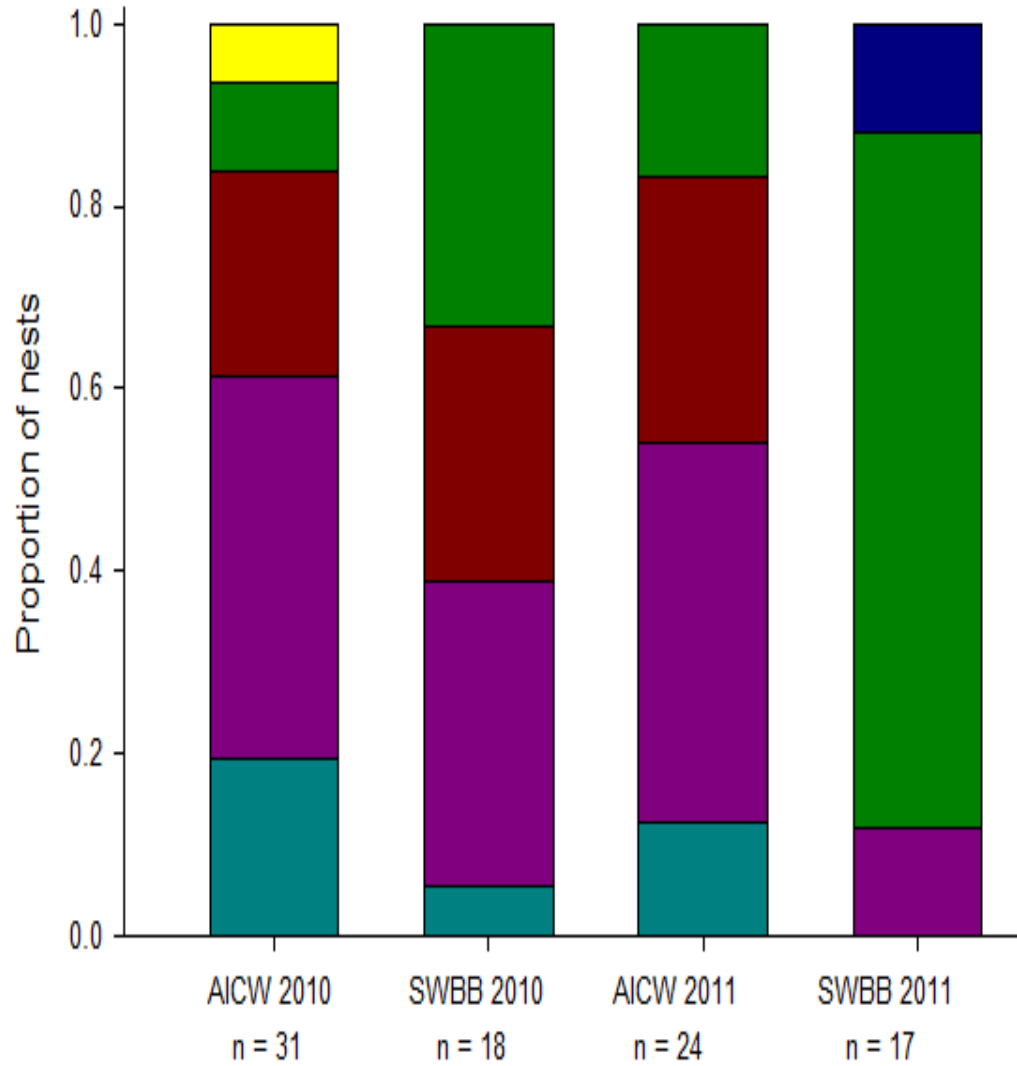


RESULTS

- Total # nests monitored during incubation:
 - Headstart n=83
 - Control n= 90
- Total # nests monitored during chick rearing:
 - Headstart n=44
 - Control n=10
- Nests monitored at intervals of 4 days or less for 94% checks (longest interval between checks = 8 days)
- Chicks monitored at intervals of 4 days or less for 91% of checks (longest interval between checks = 10days)
- Nest monitoring period:
 - April 5, 2010 – August 2, 2010
 - April 4, 2011 – August 1, 2011



CONTROL NEST FATES



Hatch Undetermined Overwashed Depredated Abandoned Failure to hatch Other



HATCH SUCCESS

Nest type	No. hatched	Hatch success
Control	10	11%
Headstart	44	53%
Left egg	1	1%

- 83 assigned HS nests for all sites/years
 - 64% of pairs continued to incubate nests until hatch date, only 16% (n=7) had leave eggs in scrape at hatch date
 - 36% of pairs abandoned nest before hatch date
 - 17% (n=14) of nests failed before egg collection
 - 16% (n=13) of nests were one egg clutches where egg was collected and no real egg was left in scrape.

INCUBATOR HATCH SUCCESS

% eggs that hatch in incubator

Year	No. eggs	No. hatch	Hatch success
2010	53	33	62%
2011	38	32	84%

% clutches that hatch at least one egg in incubator

Year	No. clutches	No. hatch	Hatch success
2010	39	28	72%
2011	32	28	88%

PARENTAL ACCEPTANCE OF HEADSTART CHICKS

Acceptance of HS chicks	Accepted chick(s)	Rejected chick(s)
Original parents	26 (59%)	2 (5%)
Foster parents	8 (18%)	1 (2%)
Real/foster parents	6 (14%)	1 (2%)

FLEDGE SUCCESS

Chick survival to 35 days	No. hatched	No. survived to 35 d
Control chicks	24	14 (58%)
HS Chicks	62	13 (21%)
All chicks	82	27 (33%)

CHICK SURVIVAL

Year	Location	1-6 days	7-20 days	21-35 days	Total
2010	AICW	7	2	1	10
	SWBB	4	0	1	5
2011	AICW	8	7	1	16
	SWBB	11	0	0	11
Total		30	9	3	42

HEADSTARTING CONCLUSIONS

- * Nest success enhanced via headstarting but fledge success can still be low and variable due in large part to predation at this sites during these years
- Useful in areas where egg loss is high and chick loss is low
 - Overwash as primary cause of nest loss
 - Nest failure due to human disturbance
 - Predators depredating eggs only
- Effective in combination with trapping efforts
 - 9 mink removed pre-laying behind shell rake in SWBB 2011– coincident with fledging of two headstarted chicks despite attempted depredation of fake eggs by raccoon

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Questions?



