

AMERICAN OYSTERCATCHER (*Haematopus palliatus*) MONITORING AT
CAPE LOOKOUT NATIONAL SEASHORE

2014 SUMMARY REPORT



American Oystercatcher dark green (J3) foraging in the ocean intertidal zone. NPS Photo 2014.

NATIONAL PARK SERVICE
CAPE LOOKOUT NATIONAL SEASHORE
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Abstract

There were 65 American Oystercatcher pairs nesting throughout the ocean beach habitat of the seashore in 2014. North Core Banks had 31 pairs, South Core Banks had 27 pairs, and Shackleford Banks had 7 pairs. Egg-laying was initiated on April 13th and a total of 87 nests were documented. Forty chicks fledged: 26 from South Core Banks, 10 from North Core Banks, and 4 from Shackleford Banks. There was a wide variation in fledge success among islands. South Core Banks was the most productive with a fledge success rate of 0.96, Shackleford Banks' fledge success was 0.57, and North Core Banks was at 0.32. Overall for the entire seashore, the fledge success rate was 0.62 per nesting pair.

Introduction

American Oystercatchers are common nesters throughout the park, primarily on the ocean beach. They are listed as a 'Bird of Special Concern' in North Carolina by the North Carolina Wildlife Resource Commission. Their choice of nesting habitat makes them particularly vulnerable to disturbance by park visitors and off-road vehicles.

Monitoring American Oystercatcher nesting at Cape Lookout National Seashore (CALO) began in 1995. A researcher from Duke University studied nesting on South Core Banks and found low reproductive success (Novick 1996). She documented chick mortality caused by off-road vehicles. Researchers from North Carolina State University (NCSU) and park staff have also recorded vehicle traffic chick mortality (Schulte 2012). Since 1997 NCSU and park staff have conducted censuses, monitored nesting success, and banded oystercatchers in the park. Data in this summary report is presented from the last eleven breeding seasons when all of the seashore was monitored regularly, 2004 to 2014.

Site Description

Cape Lookout National Seashore is located in the southern Outer Banks of North Carolina between Ocracoke and Beaufort Inlets. The seashore was divided into four barrier islands during the 2014 breeding season. The northernmost island, North Core Banks (NCB), is currently 18 miles long, extending from Ocracoke Inlet to Old Drum Inlet. Middle Core Banks (MCB) extends from Old Drum Inlet to Ophelia Inlet at four miles in length. For reporting purposes MCB is treated as part of NCB, representing breeding pairs from Ocracoke Inlet to Ophelia Inlet, mile 0 to mile 22.7. South Core Banks (SCB) extends southward from Ophelia Inlet almost 24 miles to Barden Inlet. The Core Banks have a northeast to southwest orientation and exhibit a low profile landscape. The fourth island, Shackleford Banks (SB), is 9 miles long and has an east-west orientation with a higher dune system and larger areas of vegetation. All islands in the park are subject to constant and dramatic change by the actions of wind and waves.

Methods

The Interim Protected Species Management Plan/ Environmental Assessment (IPSMP/EA) 2006 contains guidelines of the management and monitoring protocols (National Park Service 2006). Park Service staff conducted surveys of Shackleford Banks nesting birds twice a week beginning in April. Weekly surveys of nesting habitat on North and South Core Banks also began in April and breeding monitoring was continued seven days per week until the end of the nesting season. Although NCSU research staff has regularly assisted in monitoring efforts in the past, park staff were solely responsible for American Oystercatcher monitoring along the seashore in the 2014 season. Park staff performed all management actions for oystercatchers.

Management actions for oystercatchers included closing the area around a nest with “Bird Sanctuary” signs if the nest was in danger of being run over by off-road vehicles or stepped on by pedestrians. Generally, nests found in the dunes were not posted. There is some concern that predators might learn to associate posts with nests. Small posted areas may also unnecessarily attract curious park visitors and cause disturbance.

In addition to the closure around the nest, a 600-foot buffer was established around each nest to reduce disturbance. McGowan and Simons (2006) found evidence that human recreational disturbance can alter incubation behavior. This buffer allowed vehicle and pedestrian traffic to pass by on the lower beach by the ocean shoreline, but prevented stopping, parking, or camping near the nest that could reduce nest attendance by parents. The buffer zone was defined by two sets of 18” X 18” yellow signs placed on each side of a nest.

The locations of the nests were recorded using a GPS unit and the park’s mile marker system. Nest locations were marked inconspicuously with either a stake or objects like sticks or shells to facilitate follow-up checks. Information about the habitat type was also noted. If one or both adults were banded, that information was recorded on the nest data sheet.

Nests were checked regularly, every 1 to 3 days, to monitor the status of incubation and document losses. One day before the expected time of hatch, the ocean beach in that area was closed to vehicles with traffic routed to the backroad, a sand trail behind the primary dunes. In areas where there is no backroad, signs were placed on the beach warning of the presence of flightless chicks and reducing the speed limit to 15mph. Chicks were monitored daily until they fledged or were lost. Since 2010, chicks were considered fledged at 35 days old for productivity records. For management purposes, the chicks are considered fledged when strong flight is actually observed.

Results

Sixty-five pairs of American Oystercatchers nested at CALO (Table 1). Counts were for pairs on or near the ocean beach and did not include marsh islands.

Table 1. American Oystercatcher Nesting Pairs- 2014.

North Core Banks	31 pairs
South Core Banks	27 pairs
Shackleford Banks	7 pairs

Nesting pairs were spread throughout most of the ocean beach habitat in the park (Figures 1 & 2). The birds did not use areas adjacent to buildings and concentrations of people. The Middle Core Banks section is considered part of the North Core Banks for reporting purposes, mile 0 to mile 22.7

Hatch and Fledge Success

Throughout the seashore, eighty-seven nests were found, 38 of which hatched at least one egg. Forty chicks were known to survive 35 days to fledge (Table 2). Of the nests that failed, 27 nests failed due to unknown causes, 15 were lost to predation, six were lost to weather events, and one was abandoned (Table 3). Raccoon (4), coyote (4), ghost crab (3), and cat (1) were found to be predators of oystercatcher eggs. There were two nests predated by undetermined predators. Table 4 summarizes the reproductive success over the last 11 years. The fledgling success is calculated using the known nesting pairs. This allowed for cross-year comparisons with variable monitoring efforts and other unknowns. Chart 1 illustrates the reproductive success over the last 11 years. In 2014, sixty-five known nesting pairs produced forty fledglings for a fledge success rate of 0.62. Individual nest data are found in Appendix 1. Tables 5, 6, 7, and 8 summarize the reproductive success by island with known and comparable data.

Table 2. Oystercatcher Nesting by Island 2014.

Island	#pairs	#Nests	#Nests Hatched	#Chicks Fledged
North Core Banks	31	44	11 (25%)	10
South Core Banks	27	35	23 (66%)	26
Shackleford Banks	7	8	4 (50%)	4
CALO Total	65	87	38 (44%)	40

Table 3. 2014 Causes of Nest Failure.

Island	Predation	Flooding/ Storms	Human Disturbance	Abandoned	Unknown
North Core Banks	9	1	0	1	22
South Core Banks	6	4	0	0	2
Shackleford Banks	0	1	0	0	3
CALO total	15	6	0	1	27

Table 4. Summary of Seashore Oystercatcher Reproductive Success Data, 2004-2014.

Year	Island	#Nests	#Nests Hatched	#Pairs (nesting)	#Chicks fledged
2004	Cape Lookout N.S.	71	38 (54%)	52	45 (0.86)
2005	Cape Lookout N.S.	66	26 (39%)	54	18 (0.33)
2006	Cape Lookout N.S.	70	23 (33%)	52	26 (0.50)
2007	Cape Lookout N.S.	99	21(21%)	61	31 (0.51)
2008	Cape Lookout N.S.	91	17 (19%)	57	15 (0.26)
2009	Cape Lookout N.S.	83	20(24%)	61	21 (0.34)
2010	Cape Lookout N.S.	113	28 (25%)	62	34 (0.55)
2011	Cape Lookout N.S	114	29 (25%)	62	37 (0.60)
2012	Cape Lookout N.S.	99	31 (31%)	58	42 (0.72)
2013	Cape Lookout N.S.	104	32 (31%)	63	25 (0.40)
2014	Cape Lookout N.S.	87	39 (37%)	65	40 (0.62)

Chart 1. The Number of Seashore Oystercatcher Nesting Pairs and Chicks Fledged by Year with Simple Linear Regression Lines, 2004 to 2014.

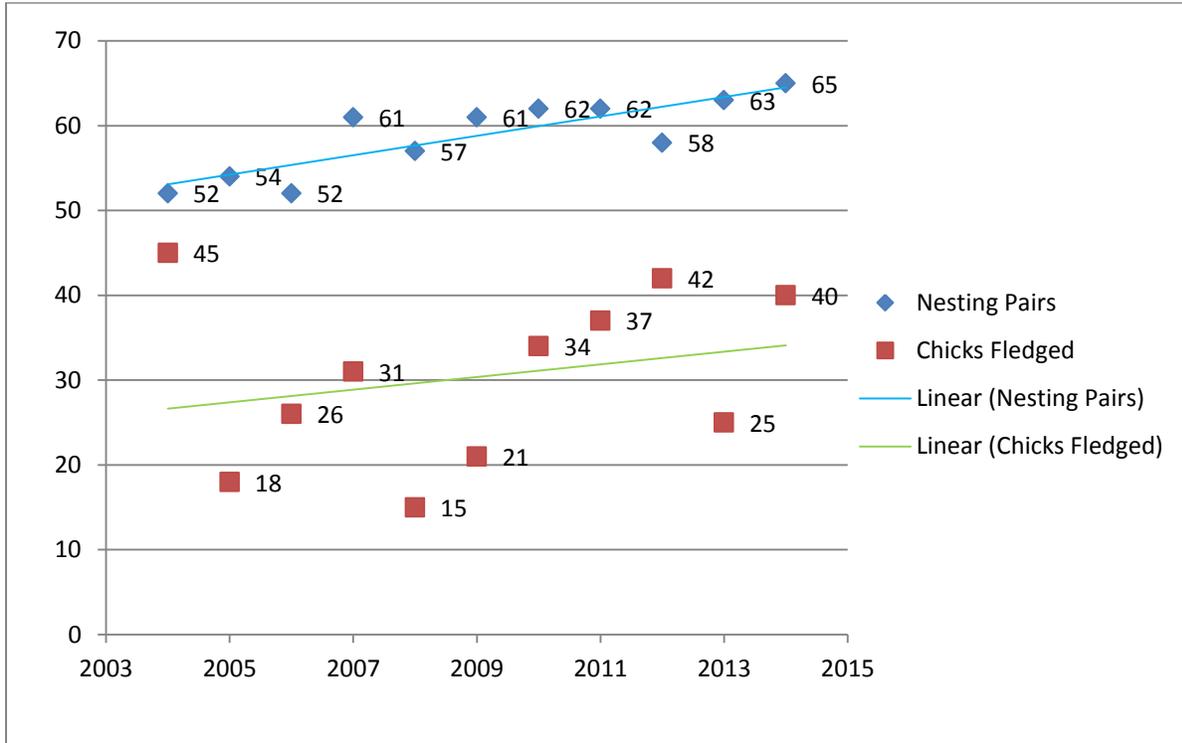


Table 5. Summary of North Core Banks, Ocracoke Inlet Mile 0 to Ophelia Inlet mile 22.7 Oystercatcher Reproductive Success Data, 2004-2014.

Year	Island	#Nests	#Nests Hatched	#Pairs (nesting)	#Chicks fledged
2004	North Core Banks	30	24 (80%)	26	38 (1.46)
2005	North Core Banks	29	16 (64%)	23	15 (0.65)
2006	North Core Banks	28	16 (57%)	24	15 (0.62)
2007	North Core Banks	46	17 (37%)	30	27 (0.90)
2008	North Core Banks	30	9 (30%)	22	10 (0.45)
2009	North Core Banks	40	7 (18%)	29	8 (0.28)
2010	North Core Banks	58	15 (26%)	31	15 (0.48)
2011	North Core Banks	54	18 (33%)	32	24 (0.75)
2012	North Core Banks	45	16 (36%)	28	26 (0.93)
2013	North Core Banks	50	12 (24%)	30	13 (0.43)
2014	North Core Banks	44	11 (25%)	31	10 (0.32)

Table 6. Summary of Middle Core Bank Section of NCB, Old Drum Inlet Mile 18.85 to Mile 22.7 Ophelia Inlet, Oystercatcher Reproductive Success Data from 2004 to 2014.

Year	Island	#Nests	#Nests Hatched	#Pairs (nesting)	#Chicks fledged
2004	Middle Core Banks	5	4 (80%)	5	7 (1.40)
2005	Middle Core Banks	9	5 (55%)	7	9 (1.28)
2006	Middle Core Banks	10	8 (80%)	10	10 (1.00)
2007	Middle Core Banks	14	9 (64%)	13	13 (1.00)
2008	Middle Core Banks	8	5 (62%)	8	7 (0.88)
2009	Middle Core Banks	13	3 (23%)	10	1 (0.10)
2010	Middle Core Banks	24	4 (17%)	13	2 (0.15)
2011	Middle Core Banks	23	8 (35%)	14	12 (0.86)
2012	Middle Core Banks	19	7 (37%)	13	12 (0.92)
2013	Middle Core Banks	17	7 (39%)	13	9 (0.69)
2014	Middle Core Banks	18	4 (22%)	13	5 (0.38)

Table 7. Summary of South Core Banks Oystercatcher Reproductive Success Data from 2004 to 2014.

Year	Island	#Nests	#Nests Hatched	#Pairs (nesting)	#Chicks fledged
2004	South Core Banks	33	13 (39%)	20	6 (0.30)
2005	South Core Banks	27	9 (33%)	22	3 (0.14)
2006	South Core Banks	31	6(19%)	19	10 (0.53)
2007	South Core Banks	41	4(21%)	21	4 (0.19)
2008	South Core Banks	44	5 (11%)	24	5 (0.21)
2009	South Core Banks	30	11(37%)	22	11 (0.50)
2010	South Core Banks	43	11 (25%)	23	17 (0.74)
2011	South Core Banks	51	9 (18%)	24*	12 (0.50)
2012	South Core Banks	41	15 (36%)	22	16 (0.73)
2013	South Core Banks	46	19 (41%)	27	12 (0.44)
2014	South Core Banks	35	23 (66%)	27	26 (0.96)

*Shackleford and South Core shared a nesting pair

Table 8. Summary of Shackleford Banks Oystercatcher Reproductive Success Data from 2004 to 2014.

Year	Island	#Nests	#Nests Hatched	# Pairs (nesting)	#Chicks fledged
2004	Shackleford Banks	8	1 (12%)	6	1 (0.17)
2005	Shackleford Banks	10	1 (10%)	9	0 (0.00)
2006	Shackleford Banks	11	1 (9%)	9	1 (0.11)
2007	Shackleford Banks	12	0 (0%)	10	0 (0.00)
2008	Shackleford Banks	17	3 (18%)	11	0 (0.00)
2009	Shackleford Banks	13	2 (15%)	10	2 (0.20)
2010	Shackleford Banks	12	2 (17%)	8	2 (0.25)
2011	Shackleford Banks	9	2 (22%)	7*	1 (0.14)
2012	Shackleford Banks	13	0 (0%)	8	0 (0.00)
2013	Shackleford Banks	8	1 (12%)	6	0 (0.00)
2014	Shackleford Bands	8	4 (50%)	7	4 (0.57)

*Shackleford and South Core shared a nesting pair

Banding

Thirty-two chicks were captured and banded along the seashore by park staff working under a banding permit from NCSU. Eight chicks fledged without bands mainly due to inaccessibility of the MCB section. Park staff recorded band re-sights of individuals and nesting pairs in the seashore throughout the summer. Of the 65 nesting pairs, 47 pairs (72%) had at least one individual of the pair banded, while 18 pairs (28%) were unbanded. NCB had 23 pairs banded and eight pairs unbanded. SCB had 23 pairs banded and 4 pairs unbanded. SB had one pair banded and six unbanded pairs. There were 61 (47%) individual adults that are banded and 68 (52%) that are unbanded in the nesting population in 2014. There was one individual that was not identified on NCB (pair 28). See appendix 1 for nesting pair re-sight data and 2014 chick band data. Round bands with three letter codes in a triangle configuration were used this year on all birds. There was no chick mortality due to banding efforts. Details on oystercatcher band combinations can be found at the website: <http://www.amoywg.org/banding-re-sighting/>.

Discussion

Hurricane Arthur made landfall on the seashore on July 4th, affecting American Oystercatcher productivity. The Category 2 hurricane caused the failure of 4 nests, one nest on NCB and three nests on SCB. There were no new nesting attempts after the storm. Four broods are suspected to have been lost due to Hurricane Arthur. Two broods on NCB and two broods on SCB were

active during last checks before the storm while no chicks were seen after. Twelve broods survived the storm and the American oystercatcher chicks fared better than other chick species.

Hatch rates in 2014 varied throughout the park. Hatch success rates were 25% on North Core Banks, 66% on South Core Banks and 50% on Shackleford Banks. Predators (15), weather events (6), and abandonment (1) were the known causes of nest losses. There was no indication of human disturbance as a cause of nest loss. There were 27 unknown nest losses, 22 on NCB, 2 on SCB, and 3 on SB. On NCB, raccoon, ghost crab, and feral cat predation lowered the hatch success, but the majority were lost to unknown causes. Late and re-nesting pairs on NCB appear to have experienced a mid-season drop off in hatch success. While 10 out of 25 (40%) of nests laid by May 13 on NCB successfully hatched, only 1 out of 19 (0.05%) laid after May 13 survived. Coyote predation was recorded for 4 nests on SCB. Despite the presence of coyote on SCB the hatch success was the highest recorded in 11 years at 66%. Raccoon, a primary nest predator, predation was low on SCB in 2014. Evidence of fox and coyote activity has been suspected to have played a role in low productivity on SB in past years. There was no coyote or fox predation documented on SB in 2014 and hatch success increased to 50%. Hurricane Arthur caused the failure of 4 nests across the seashore.

Fledge success in the park was 0.62 chicks per nesting pair with a large variance by island. SCB and SB showed the highest fledge success in the last 11 years, 0.96 and 0.57, respectively. Conversely, NCB saw a decrease in fledging success at 0.32. Out of 11 nests that hatched on NCB, 8 fledged chicks (73%). NCB's poor hatch success is reflected in its low fledge success rate. On the MCB section, productivity declined down to just 5 fledglings. Nest failure was problematic with the lowest hatch success in 11 years. Predation appears to have increased on all beach nesting birds on MCB in the last three years. However MCB still shows the highest concentration of oystercatcher pairs along the seashore at 3.4 pairs per mile, while NCB (mile 0-19), SCB, and SB have approximately 1 pair per mile. Although MCB may continue to attract more breeding pairs than other islands, productivity (0.38) was comparable to the rest of NCB (0.32) in the 2014 season. Out of 23 nests that hatched on SCB, 13 fledged chicks (57%). Ten broods were lost after hatching on SCB. Though the causes of these chick failures are unknown the presence of a canine predator on SCB is suspect. Two broods on NCB and two broods on SCB are suspected to have been lost due to Hurricane Arthur.

A range-wide productivity standard was established defining fledging at 35 days old. This standard provides consistency throughout the nesting range. A total of 40 chicks reached 35 days old and were considered fledged: this is reflected in the seashore-wide 0.62 productivity rate. However, we know that most chicks cannot actually fly at day 35. The average age of chicks fledging in 2014 from 17 broods was 42 days from the hatch date. This calculation excludes 8 broods with unknown exact fledge dates. The range of fledging age, determined from the 17 broods, was from 37 to 46 days (Appendix 1). Chicks are monitored and managed until they exhibited strong flight greater than 150 feet. There was no known chick loss to motor vehicles this year.

Nesting pairs increased from 63 pairs in 2013 to 65 pairs in 2014. Part of this change can be explained with the addition of new pairs and/or marked individuals. There were four new pairs identified by either their unique leg bands and/or establishment of new territories. Dark Green HR, PY, RR, WF, TN, UJ, CX, LN, and RU were all new nesters along the shoreline. Dark Green CFX, an NCB nester from previous years, was re-sighted with its mate on territory throughout the breeding season. However, a nest was never found and they were not counted as a breeding pair for this season. The long term banding and monitoring program at the seashore can also tell us about the nesting population dynamics, such as pairs that persist and produce fledglings over the years. Dark green 16 has been nesting at Cape Point on SCB every year since 2003 when it was first tagged and has produced seven fledglings. In 2009 dark green (CP) fledged from Cape Point and has since established its own nesting territory at Power Squadron Spit in 2013 and fledged one chick in 2014.

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Figure 1.

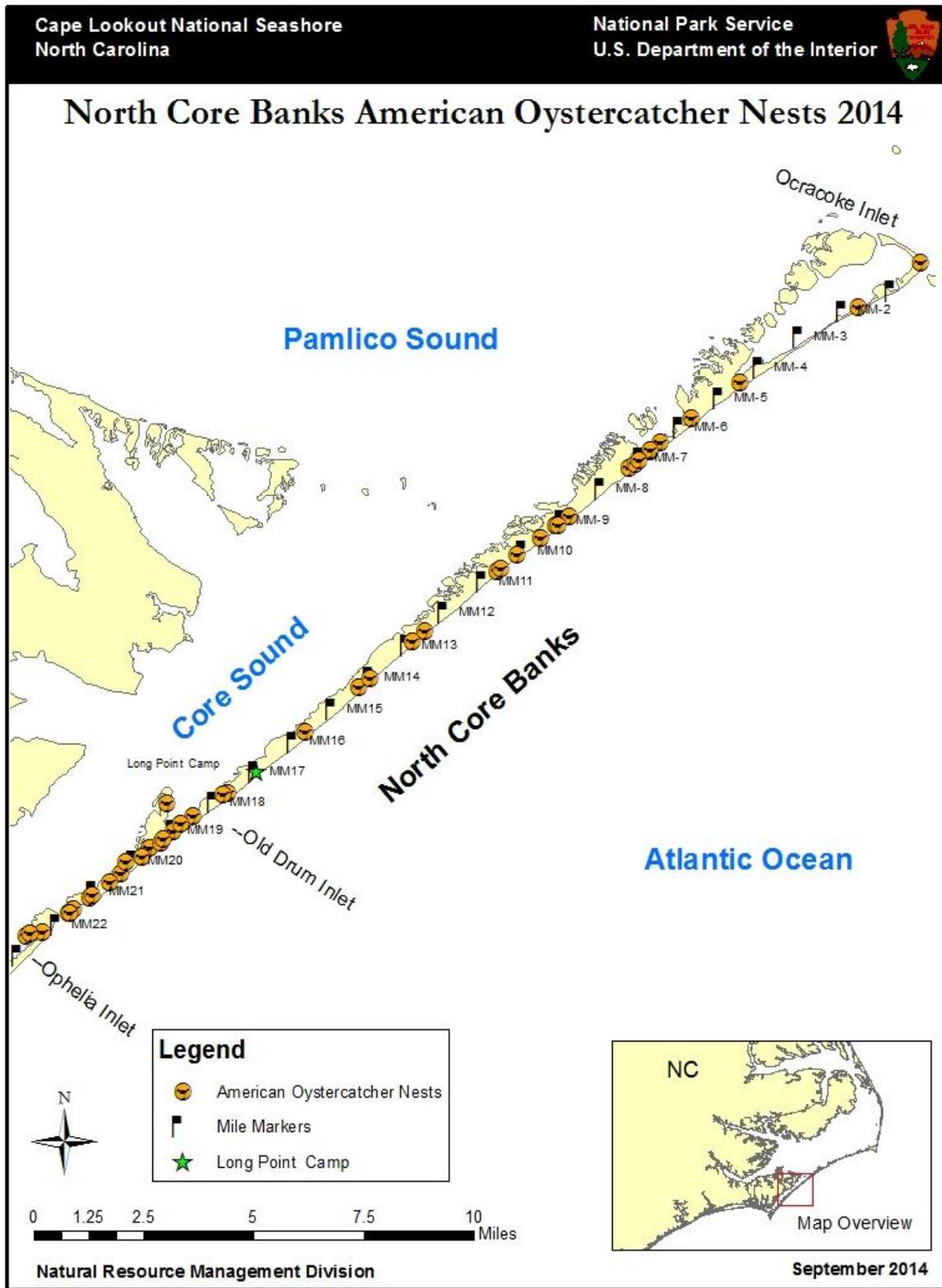
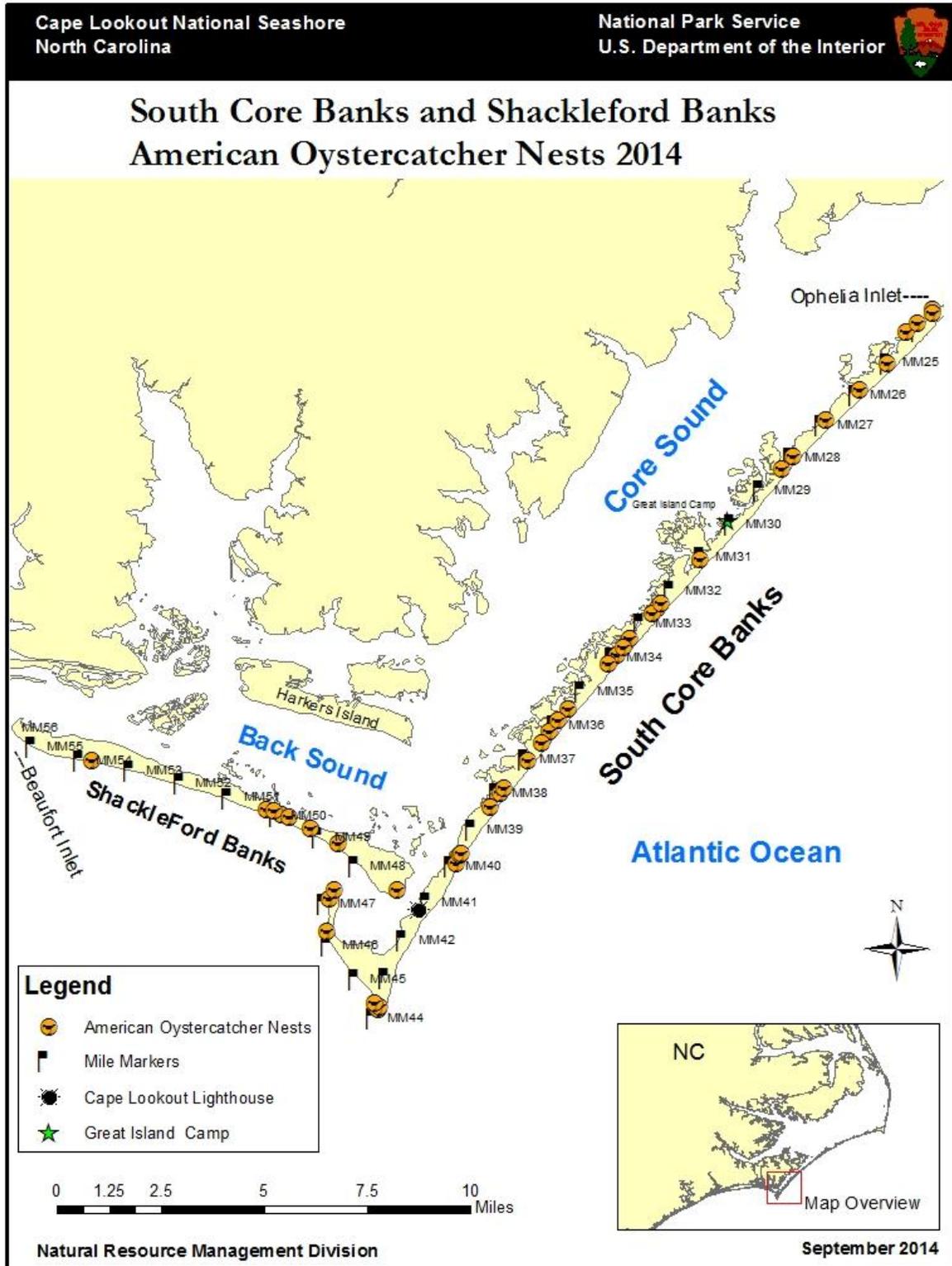


Figure 2.



APPENDIX 1A AMERICAN OYSTERCATCHER NESTS- NORTH CORE BANKS-2014

Nest #	Pair #	Adult Bands	Mile	Location	Found	Eggs	Closure	Comments (Abbreviated)
1	1	DG(UT), DG(CER)	18.55	shell bed	4/23/2014	3	interior	Fledged 1 chick DG (CLE) banded on 6/24/14. Fledged at 40 days
2	2	DG(CE), UNB	17.69	upper beach	4/23/2014	1	600' buffer	Nest failed 4/24/2014- crow and ghost crab tracks at nest
3	3	DG(73), UNB	9.23	shell bed, upper beach	4/23/2014	3	600' buffer	Nest failed, unknown. 1 egg in nest cup 4/29, 0 eggs on 4/30
4	4	DG(E0), UNB	14.36	side of dune	4/23/2014	3	600' buffer	Fledged 1 chick DG(CLN) banded on 6/24/14. Fledged at 42 days
5	5	DG(M8), UNB	19.64	base of dune, up swash	4/26/2014	3	no	Fledged 2 chicks by 38 days, unbanded. 1 unhatched egg.
6	6	DG(R2), UNB	19.41	side of dune	4/28/2014	2	interior	Fledged 1 chick by 44 days, unbanded.
7	7	UNB, UNB	19.86	raised shell bed	4/28/2014	2	no	Nest failed 5/23- unknown
8	8	DG(K2), UNB	21.21	raised shell bed	4/28/2014	2	no	Nest failed 5/23- unknown
9	9	DG(AN), UNB	22.70	raised shell bed	4/30/2014	3	interior	Nest failed 5/23- unknown
10	10	UNB, UNB	8.91	upper beach	5/3/2014	3	600' buffer	Brood failed ~7/4, suspected failure due to Hurricane Arthur. 1 chick found dead in nest cup 6/4
11	2	DG(CE), UNB	17.78	Shell bed behind dunes	5/3/2014	3	600' buffer	Fledged 1 chick DG (CTL) by day 58, banded on 7/1/14. One egg unhatched.
12	11	UR-Red, UNB	12.93	side of dune	5/4/2014	3	600' buffer	Nest failed 5/14/14- raccoon tracks in nest cup
13	12	DG(T6), DG(CE1)	10.73	base of dune	5/4/2014	3	600' buffer	Nest failed 6/1- unknown
14	13	RED(4L), UNB	7.36	shell bed, base of dune	5/6/2014	3	600' buffer	Nest failed 6/1- unknown
15	14	LL-Blue, UNB	20.41	shell bed, upper beach	5/7/2014	3	no	Nest failed 5/13- unknown
16	15	UNB, UNB	20.05	upper beach	5/7/2014	4	no	Fledged 2 chicks on 7/14, fledged by 41 days
17	16	UNB, UNB	6.83	shell flat	5/8/2014	3	600' buffer	Failed 5/25, unknown. 1 egg 5/24, 0 eggs 5/25 with ghost crab tracks
18	17	DG(C1),DG(F3)	5.77	shell flat	5/8/2014	3	600' buffer	Brood failed on 6/7, cause unknown
19	18	DG(CE3), UNB	6.55	base of high dunes	5/8/2014	3	interior	Nest failed 5/15, raccoon tracks in nest cup
20	19	DG(M0), DG(74)	19.05	raised shell bed	5/9/2014	3	no	Nest failed 5/23, unknown
21	20	DG(TF), UNB	21.61	shell flat	5/9/2014	2	no	Nest failed 5/23, unknown
22	3	DG(73), UNB	9.18	shell flat	5/10/2014	3	600' buffer	Nest failed 5/27, unknown, possibly ghost crab
23	21	DG(W5), UNB	14.08	base of dunes	5/10/2014	3	600' buffer	Fledged 1 chick DG (CTM) banded on 7/9/14. Fledged at 40 days. 1 piped egg that never hatched.
24	22	UNB, UNB	20.70	shell bed, base of dunes	5/12/2014	3	no	Nest failed 5/23, unknown
25	23	UNB, UNB	4.55	shell bed, base of dunes	5/13/2014	3	600' buffer	Fledged 1 chick DG (CT3), banded on 7/9/14. Fledged at 42 days
26	24	DG (WF), DG (TN)	18.85	shell flat	5/14/2014	2	interior	Nest failed 5/30, unknown

27	25	DG (CY), DG (RR)	7.22	shell bed, base of dunes	5/15/2014	2	600' buffer	Nest failed 5/19, unknown
28	26	UNB, UNK	1.78	top of low dune	5/20/2014	1	interior	Nest failed 5/21, unknown
29	27	UNB, UNB	0.21	top of dunelets	5/22/2014	1	interior	Nest failed 6/12, unknown
30	28	DG (P5), UNB	22.39	between dunelets	5/23/2014	2	interior	Nest failed 6/2, raccoon tracks
31	11	UR-Red, UNB	12.61	shell bed	5/24/2014	1	600' buffer	Nest failed 5/25, unknown
32	29	RED(2L); UNB	10.20	top of small dune	5/25/2014	2	600' buffer	Nest failed 6/8, raccoon tracks
33	8	DG(K2), UNB	21.12	shell bed	5/26/2014	3	interior	Nest failed 6/14, unknown. DG (K2) found dead on beach 7/10
34	20	DG (TF), UNB	21.72	raised shell bed	5/26/2014	1	interior	Nest failed 5/31, unknown
35	11	UR-Red, UNB	12.89	upper beach	5/28/2014	1	600' buffer	Nest failed 5/30, ghost crab
36	30	DG (HR), DG(PY)	15.76	shell bed, behind backroad	5/28/2014	2	no	Nest abandoned, unknown reason
37	9	DG(AN), UNB	22.61	shell flat	6/2/2014	2	interior	Nest failed 6/6, ghost crab
38	19	DG (M0), DG (74)	19.32	between dunes	6/2/2014	2	interior	Brood failed ~7/4, suspected failure due to Hurricane Arthur
39	16	UNB, UNB	6.80	shell flat	6/5/2014	2	interior	Nest failed 7/4, Hurricane Arthur
40	20	DG (TF), UNB	21.70	shell bed	6/6/2014	1	interior	Nest failed 6/14, unknown
41	25	DG (CY), DG (RR)	7.12	shell bed between dunes	6/7/2014	2	600' buffer	Nest failed 6/28, unknown
42	3	DG (73), UNB	9.63	base of dunes	6/7/2014	3	600' buffer	Nest failed 6/21, cat tracks
43	12	DG (T6), DG (CE1)	10.63	upper beach	6/12/2014	3	600' buffer	Nest failed 6/21, unknown predator, yoke in nest cup
44	31	O/X:B/-, UNB	19.95	soundside beach	6/20/2014	2	no	Nest failed 6/25, unknown

31 nesting pairs, 44 nests, 11 nests hatched, 10 chicks fledged

APPENDIX 1B

AMERICAN OYSTERCATCHER NESTS- SOUTH CORE BANKS-2014

Nest #	Pair #	Adult Bands	Mile	Location	Found	Eggs	Closure	Comments (Abbreviated)
1	1	DG (I6), UNB	44.2	inside Point closure	4/13/2014	3	Interior	Nest FAILED 4/30/14 - Coyote predation, tracks at nest, 1 munched egg
2	2	DG (L2), UNB	39.73	side of dune	4/18/2014	2	600' buffer	Nest FAILED 4/20/14, likely due to bad weather. Nest cup gone, egg found on a dune away from nest
3	3	DG (R8), O-UL	38.01	near dune base	4/18/2014	2	600' buffer	Fledged 1 chick- DG (CK0), fledged at day 39
4	4	DG (UR), DG (UP)	39.93	edge of dune base	4/20/2014	3	600' buffer	Brood FAILED 6/11 - unknown
5	5	DG (K0), UNB	32.55	upper beach /dunes	4/23/2014	2	600' buffer	Brood FAILED 6/11 - unknown
6	6	UNB, UNB	31.1	shell flat in dunes	4/23/2014	3	600' buffer	Fledged 3 chicks DG (CK6, CK7, CK8) at day 42
7	7	DG (TE), UNB	28.37	upper beach /dunes	4/23/2014	3	600' buffer	Fledged 3 chicks, 2 banded DG (CK2, CK1), Fledged at day 46
8	8	DG (UY), UNB	23.46	soundside dune	4/23/2014	3	Interior	Day 35 1 Fledgling, 7/2 - 1 fledgling found dead near adults
9	9	DG (T8), UNB	32.71	upper beach	4/23/2014	3	600' buffer	Brood FAILED 6/11 - unknown
10	10	DG (NF), UNB	33.47	upper beach	4/23/2014	3	600' buffer	Fledged 3 chicks DG (CLK, CLL, CLM). one day 35 fledgling, 2 chicks fledged at day 40
11	11	DG (AR), DG (AP)	33.93	upper beach	4/23/2014	2	600' buffer	Nest FAILED 5/2/14 - Unknown
12	12	DG (JC), DG (TC)	27.98	near dune base	4/25/2014	3	600' buffer	Fledged 2 chicks DG(CK9, CK3) at day 41
13	13	DG (UL), UNB	43.72	shell flat, Cape Point	4/25/2014	3	Interior	Brood FAILED 6/3- unknown
14	14	UNB, UNB	47.00	PSS, back on dunes	4/25/2014	3	Interior	Fledged 1 chick DG (CLP) by day 52
15	15	DG (J3), UNB	24.32	soundside	4/26/2014	1	Interior	Brood FAILED 6/9 - unknown
16	16	DG (MI), DG (J0)	35.56	dunes	4/27/2014	3	600' buffer	Brood FAILED 6/18 - unknown. Extra pair of yellow signs used for 600' buffer
17	17	DG (CP), UNB	46.35	dune line	4/27/2014	3	600' buffer	Fledged 1 chick at day 41. 2 chicks banded DG (CK4, CK5) but one never seen after 6/16. Extra pair of yellow buffer signs used
18	2	DG (L2), UNB	39.71	on dune	4/30/2014	3	600' buffer	Nest FAILED 5/5/14 - unknown
19	18	DG (CF7), UNB	26.92	shell flat behind dunes	5/2/2014	3	600' buffer	Fledged 3 chicks at day 39, only 2 banded DG (CLJ, CLH)
20	19	DG (RU), UNB	34.22	upper beach	5/2/2014	2	600' buffer	Fledged 2 chicks at day 44 DG (CLR, CLT)
21	20	DG (33), DG (LN)	25.07	next to backroad	5/3/2014	2	600' buffer	Fledged 2 chicks DG (CLA, CLF) at day 44
22	21	Red- UR, UNB	36.23	shell flat near shrub line	5/3/2014	2	None	Nest FAILED 5/8/14 - coyote tracks at nest
23	22	DG (J9), UNB	37.05	on top of dune	5/3/2014	3	600' buffer	Nest FAILED 5/28 - Coyote predation
24	23	DG (AL), DG (AL)	23.56	low dune	5/6/2014	3	None	Fledged 2 chicks at day 37DG (CTF, CTE)
25	24	Y; - ; W ; -, UNB	23.91	back shell flat	5/6/2014	3	None	Brood FAILED 7/5 - found one chick dead DG(CLW), did not see any other chicks after 7/5

26	25	UNB, UNB	38.40	shell flat in between dunes	5/9/2014	3	600' buffer	Fledged 1 chick DG (TCC) at day 39
27	26	DG (UJ), UNB	25.92	behind dunes	5/12/2014	1	600' buffer	Nest FAILED 6/2 - Faint predator tracks around nest, nest cup dug up. Unknown predator.
28	11	DG (AR), DG (AP)	33.70	Base of low dune on mound	5/14/2014	1	600' buffer	Brood FAILED 7/17 - hadn't seen chick since 6/28, unknown
29	1	DG (I6), UNB	44.37	Point Closure	5/16/2014	2	600' buffer	Brood FAILED 6/13 - unknown
30	21	Red- UR, UNB	35.89	shell flat near shrub line	5/24/2014	3	None	Nest FAILED 5/24 - Found predated, unknown predator.
31	27	UNB, UNB	47	PSS, soundside of closure	6/9/2014	UNK	Interior	Fledged 1 chick DG (CTC)- last seen on 7/10 when banded at day 36
32	2	DG (L2), UNB	39.66	upper beach	6/11/2014	1	600' buffer	Nest FAILED 6/16 - Coyote predation
33	5	DG (K0), UNB	32.42	upper beach	6/18/2014	3	600' buffer	Nest FAILED 7/4 - due to Hurricane Arthur
34	21	Red- UR, UNB	36.55	on dune ledge, near edge	6/24/2014	2	600' buffer	Nest FAILED 7/4 - due to Hurricane Arthur
35	22	DG (J9), UNB	37.87	toe of dune	7/1/2014	2	600' buffer	Nest FAILED 7/4 - due to Hurricane Arthur

27 nesting pairs, 35 nests, 23 nests hatched, 26 chicks fledged

APPENDIX 1C AMERICAN OYSTERCATCHER NESTS- SHACKLEFORD BANKS -2014

Nest #	Pair #	Adult Bands	Mile	Location	Found	Eggs	Closure	Comments (Abbreviated)
1	1	DG (E9), UNB	50	shell flat	5/2/2014	3	none	nest failed by 5/16, unknown
2	2	UNB, UNB	49.85	back shell flat	5/2/2014	3	none	Fledged 1 chick, seen at day 40 and day 49, brood moved soundside
3	3	UNB, UNB	49.35	shell flat	5/2/2014	3	none	Fledged 2 chicks at day 38, brood moved soundside
4	4	UNB, UNB	50.31	face of low dune	5/2/2014	3	none	nest lost to flooding by 5/16
5	5	UNB, UNB	53.88	face of dune	5/9/2014	2	none	1 day 35 fledgling , chick seen on 7/2 before Hurricane at day 34, 7/3 was day 35, hurricane was on 7/4, foraged ocean beach
6	6	UNB, UNB	47	Barden Inlet	5/9/2014	2	none	nest failed by 6/1, unknown
7	7	UNB, UNB	48.68	behind dune in field	5/16/2014	3	none	nest failed by 6/1, unknown, went from 3 eggs on 5/19 to two eggs on 5/28, many horse tracks in area, paint stick broken
8	1	DG (E9), UNB	50.15	shell flat	6/5/2014	3	none	chicks lost shortly after hatch, went to soundside, ATV tracks at 3 feet from active nest on 6/20

7 nesting pairs, 8 nests, 4 nests hatched, 4 chicks fledged