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

2016 SUMMARY REPORT

American Oystercatcher dark green (TX), banded as a chick in 2010, predated at nest April 30, 2016. NPS Photo 2016.

NATIONAL PARK SERVICE
CAPE LOOKOUT NATIONAL SEASHORE
131 CHARLES STREET
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Abstract

There were 70 American Oystercatcher pairs nesting throughout the ocean beach habitat of the seashore in 2016. North Core Banks had 31 pairs, South Core Banks had 33 pairs, and Shackleford Banks had 6 pairs. Egg-laying was initiated on April 10th and a total of 121 nests were documented. Seventeen chicks fledged: 3 from South Core Banks, 13 from North Core Banks, and 1 from Shackleford Banks. There was variation in fledge success among islands. North Core Banks was the most productive with a fledge success rate of 0.42, Shackleford Banks' fledge success was 0.17, and South Core Banks' was at 0.09. Overall for the entire seashore, the fledge success rate was 0.24 fledglings per nesting pair. This is the lowest productivity at CALO in the past 13 years.

Introduction

American Oystercatchers are common nesters throughout the park, primarily on the ocean beach. They have been listed since 2008 as a North Carolina Special Concern species by the North Carolina Wildlife Resource Commission (2014). 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). The research 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 and Simons 2015). Since 1997 NCSU and park staff has conducted censuses, monitored nesting success, and banded oystercatchers primarily on the core banks of the seashore. Data in this summary report are presented from the last thirteen breeding seasons, 2004 to 2016, during which all of the seashore was monitored regularly.

Site Description

Cape Lookout National Seashore is located in the southern Outer Banks of North Carolina between Ocracoke and Beaufort Inlets. The seashore was physically divided into four barrier islands during the 2016 breeding season. The northernmost island, North Core Banks (NCB), is 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 forth island, Shackleford Banks (SB), is 8 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) contains management guidelines and monitoring protocols (National Park Service 2006). Following this protocol, park staff conducted surveys of Shackleford Banks for nesting birds twice a week beginning in April. Daily surveys of nesting habitat on North and South Core Banks also began in April and breeding monitoring continued seven days per week until the end of the nesting season.

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 in decimal degrees with 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 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. Signage examples are in Appendix 1 (D). 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. Based on a standard established by the American Oystercatcher working group in 2010, chicks were considered fledged at 35 days old for range wide productivity records. For seashore management purposes, the chicks were considered fledged when strong flight was actually observed.

Results

Seventy 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- 2016.

North Core Banks	31 pairs
South Core Banks	33 pairs
Shackleford Banks	6 pairs

Nesting pairs were spread throughout most of the ocean beach habitat in the park (Appendix 1A & B). 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, 121 nests were found, 17 of which hatched at least one egg. Seventeen chicks were known to survive 35 days to fledge (Table 2). Of the nests that failed, 68 were lost to predation, 30 nests failed due to unknown causes, 2 were lost to flooding, 2 were lost to human disturbance, and 2 were abandoned (Table 3). Coyote (21), raccoon (13), ghost crab (4) were responsible for depredated oystercatcher nests. There were 30 nests depredated by undetermined predators. There were two documented instances of nest failure due to human disturbance. Table 4 summarizes the reproductive success over the last 13 years of standardized monitoring. The fledgling success is calculated using the known nesting pairs. This allowed for cross-year comparisons with variable monitoring efforts and other unknowns. Figure 1 illustrates the reproductive success over the last 13 years and shows the upward trending fledge success. In 2016, seventy known nesting pairs produced seventeen fledglings for a fledge success rate of 0.24. Individual nest data are found in Appendix 2. Tables 5, 6, 7, and 8 summarize the reproductive success by island with known and comparable data.

Table 2. Oystercatcher reproductive success by island in 2016.

Island	#Pairs	#Nests	#Nests Hatched	#Chicks Fledged
North Core Banks	31	49	8 (16%)	13
South Core Banks	33	64	7 (11%)	3
Shackleford Banks	6	8	2 (25%)	1
CALO Total	70	121	17 (14%)	17

Table 3. Causes of nest failure in 2016.

Island	Predation	Flooding/ Storms	Human Disturbance	Abandoned	Unknown
North Core Banks	16	1	0	1	23
South Core Banks	52	1	1	1	2
Shackleford Banks	0	0	1	0	5
CALO total	68	2	2	2	30

Table 4. Summary of oystercatcher reproductive success data, 2004-2016.

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)
2015	Cape Lookout N.S.	112	37 (33%)	66	50 (0.76)
2016	Cape Lookout N.S.	121	17 (14%)	70	17 (0.24)

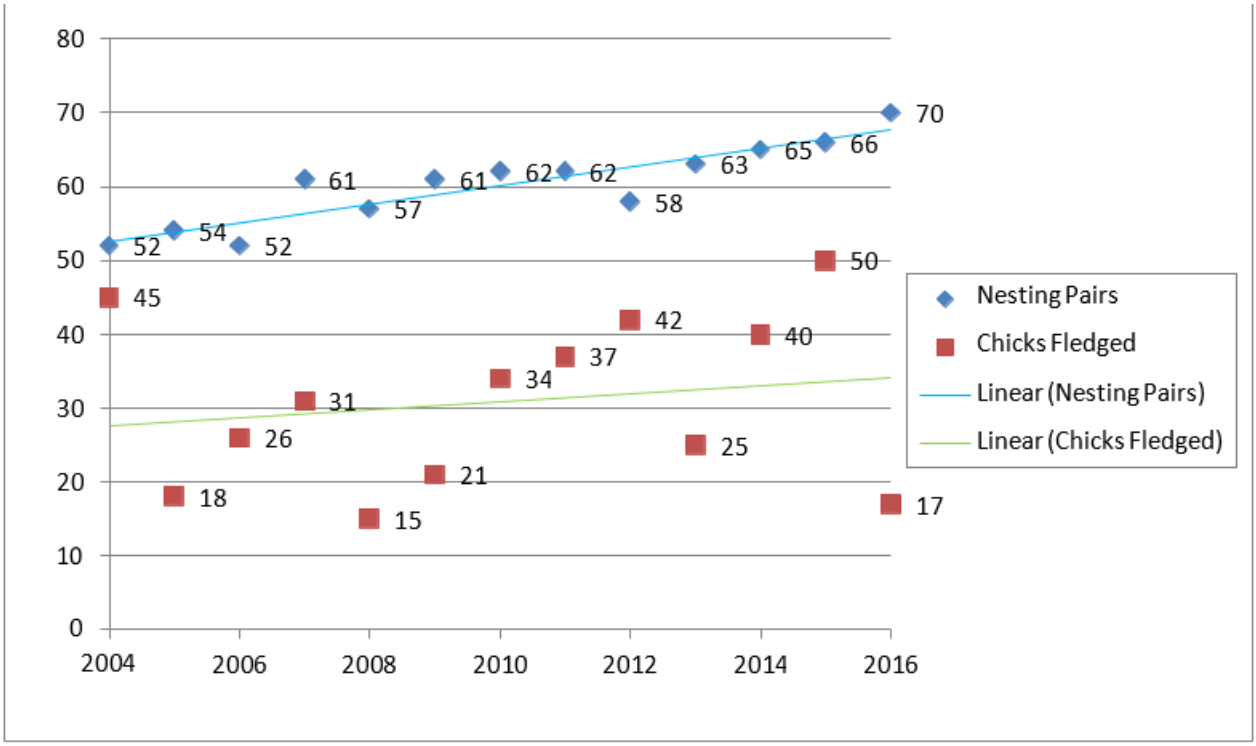

Figure 1.

The number of nesting oystercatcher pairs and number of chicks fledged by year at Cape Lookout National Seashore, 2004 to 2016. Lines illustrate the trends in these values over time.

Table 5.

Summary of oystercatcher reproductive success on North Core Banks, 2004-2016, Ocracoke Inlet mile 0 to Ophelia Inlet mile 22.7 Data.

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)
2015	North Core Banks	49	13 (27%)	29	17 (0.59)
2016	North Core Banks	49	8 (16%)	31	13 (0.42)

Table 6.

Summary of oystercatcher reproductive success on the Middle Core Bank Section of North Core Banks, 2004 to 2016, Old Drum Inlet mile 18.85 to mile 22.7 Ophelia Inlet.

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)
2015	Middle Core Banks	24	2 (8%)	13	1 (0.08)
2016	Middle Core Banks	19	2 (10%)	13	6 (0.46)

Table 7.

Summary of oystercatcher reproductive success on South Core Banks, 2004 to 2016.

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)
2015	South Core Banks	54	20 (37%)	30	28 (0.93)
2016	South Core Banks	64	7 (11%)	33	3 (0.09)

*Shackleford and South Core shared a nesting pair

Table 8.

Summary of oystercatcher reproductive success on Shackleford Banks, 2004 to 2016.

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)
2015	Shackleford Banks	9	4 (44%)	7	5 (0.71)
2016	Shackleford Banks	8	2 (25%)	6	1 (0.17)

*Shackleford and South Core shared a nesting pair

Banding

Fourteen chicks were captured and banded along the seashore by park staff working under a NCSU banding permit. Three chicks fledged without bands. These chicks were located on soundside foraging sites on SB and NCB, which were difficult to access for banding. Park staff recorded band re-sights of individuals and nesting pairs on the seashore throughout the summer. Of the 70 nesting pairs, 51 pairs (73%) had at least one individual of the pair banded, while 14 pairs (20%) were unbanded and five pairs (7%) were undetermined. NCB had 22 pairs banded and eight pairs unbanded. SCB had 29 pairs banded and four pairs unbanded. SB had no confirmed banded pairs, with two confirmed unbanded pairs, and four pairs that were not identified. There were 71 (51%) banded individual adults, 61 (43%) individuals that were unbanded, and 7 (5%) unknown individuals in the nesting population in 2016. See Appendix 2 for nesting pair re-sight data and 2016 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

Hatch success rates were 16% on North Core Banks, 11% on South Core Banks and 25% on Shackleford Banks. The total hatch success, at 14%, was the lowest on record on the seashore for the past 13 years. Predators (68), weather (2), human disturbance (2), and abandonment (2) were responsible for nest losses. There were 30 total nests lost to unknown causes, 23 on NCB, 2 on SCB, and 5 on SB. On SCB, coyote was the prominent known cause of nest loss, responsible for depredating at least 21 nests. There were four cases of raccoon predation and four cases of ghost crab predation. There were also 23 cases of nest loss in which mammal tracks were prevalent proximate to the lost nest, but the tracks were not clear enough to determine species. Coyote tracks indicated that multiple individual coyotes roamed the length of the island and had learned to prey on American Oystercatcher and tern nests. Coyote predation was limited to SCB in 2016 and was largely responsible for the record low nest success on the seashore. Raccoon predation accounted for nine nest losses on NCB. Two instances of human disturbance were also recorded. One nest on SB (SB 7) appeared to have been lost due to human disturbance and horse activity over the busy weekend preceding Memorial Day. The nest site had numerous human footprints and horse tracks and no eggs in the nest cup. One nest on SCB (SCB 59) was stepped on by an employee during a nest searching accident in dune grass.

Fledge success in the park was 0.24 chicks per nesting pair. Productivity in the seashore was the lowest in the past 13 years. Only 17 fledglings were produced. The majority of fledglings came from NCB, which produced 0.42 chicks per breeding pair. When excluding data from MCB, the northern section of NCB (mile 0-18.85) produced 7 fledglings from 18 pairs, resulting in a fledge success of 0.38. Conversely, on the MCB section (mile 18.85-22.7) productivity was 0.46, with 6 fledglings produced from 13 pairs. MCB continues to show the highest concentration of oystercatcher pairs along the seashore at 3.4 pairs per mile, while NCB (mile 0-18.85), SCB, and SB have approximately 1 pair per mile. Only three chicks fledged from SCB, resulting in a 0.09 chicks per breeding pair productivity. One of those chicks (from nest SCB 37) was taken by coyote after it was considered fledged. The chick carcass was found with coyote tracks. Five other nests failed after hatching. One of these nests, had coyote tracks up to the carcass of one of the chicks. SB produced 1 fledgling for a productivity rate of 0.17.

A range-wide productivity standard was established in 2010 by the American Oystercatcher Working Group defining fledging at 35 days old. This standard provides consistency throughout the nesting range. A total of 17 chicks reached 35 days old and were considered fledged: this is reflected in the seashore-wide 0.24 productivity rate. However, most chicks cannot actually fly at day 35. The average age of chicks fledging in 2016 from 3 broods was 43 days from the hatch

date. This calculation excludes 6 broods with unknown exact fledge dates. The range of fledging age, determined from the 3 broods, was from 42 to 43 days (Appendix 1). Chicks were monitored and managed until they exhibited strong flight greater than 150 feet. In 2016 three chicks were known to survive to day 35 but were not observed to fledge. There was no known chick loss to motor vehicles this year. Though the number of fledglings was low, the seashore attracted the highest number of oystercatcher pairs on record. The number of pairs is trending upward. This could be due to the relatively good production of fledglings from the past 3 to 5 years.

There were nine new birds identified by their unique leg bands. Dark Green CA, LP, YP, NA, RA, CE7, CFA, CE4, and CC6 were all new nesters along the shoreline. All these birds fledged from Cape Lookout in 2010-2013, except dark green LP and CC6, and have since established their own breeding territories along the seashore. Dark Green LP fledged from Shell Castle Island, NC and dark green CC6 fledged from Hatteras Island, NC. Three new pairs were established after mates were predated and the surviving mate paired up with a new bird.

Conclusions and Recommendations

American oystercatcher productivity in 2016 was the lowest on record of the past 13 breeding seasons. Coyote predation on South Core Banks severely limited hatch success and chick survival. Productivity on South Core Banks was lower in 2016 than 2004 and 2005 levels when chicks did not have the protection of vehicle free zones and vehicle chick mortality was documented. Removal of these coyotes prior to the 2017 breeding season is recommended to prevent a long term population decline of this high quality breeding site. Nest failures of first nesting attempts by predation or other losses lead to multiple re-nesting attempts, increases the energy resources expended by breeding pairs, and lengthens the breeding season. Successful first nesting attempts minimize the length of the breeding season and minimize the work load of the staff. Multiple nesting attempts equates to more nest sign management, posting and removal. Minimal field staffing levels of four six month Biological Science Technicians is recommended to monitor and managed American oystercatchers on the Core Banks. The long term banding effort of adults and chicks should continue. Banded individuals allow for the accurate monitoring of breeding birds and productivity.

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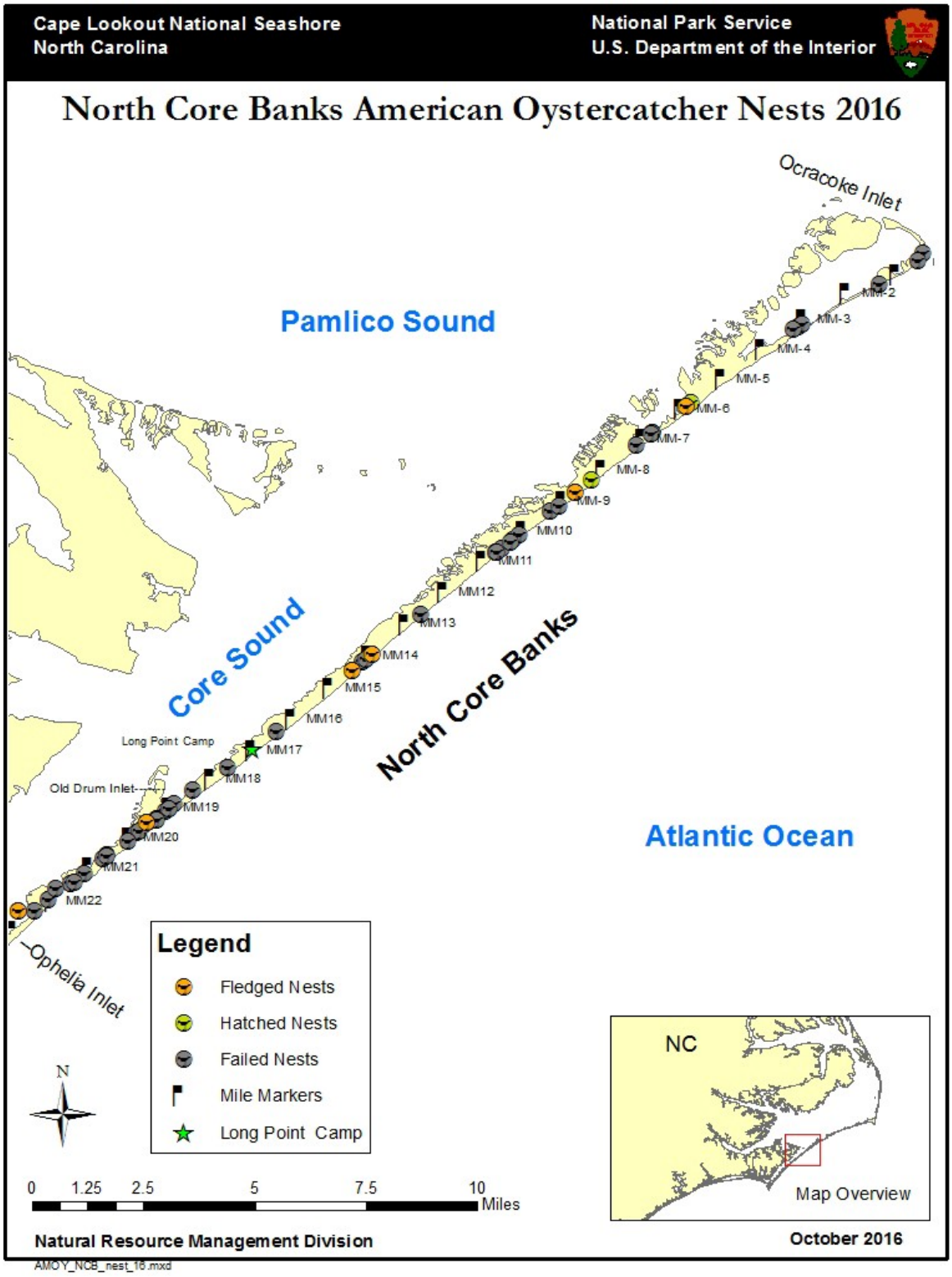
APPENDIX 1A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North Carolina
National Park Service
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Long Point Camp
Old Drum Inlet
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Natural Resource Management Division
October 2016
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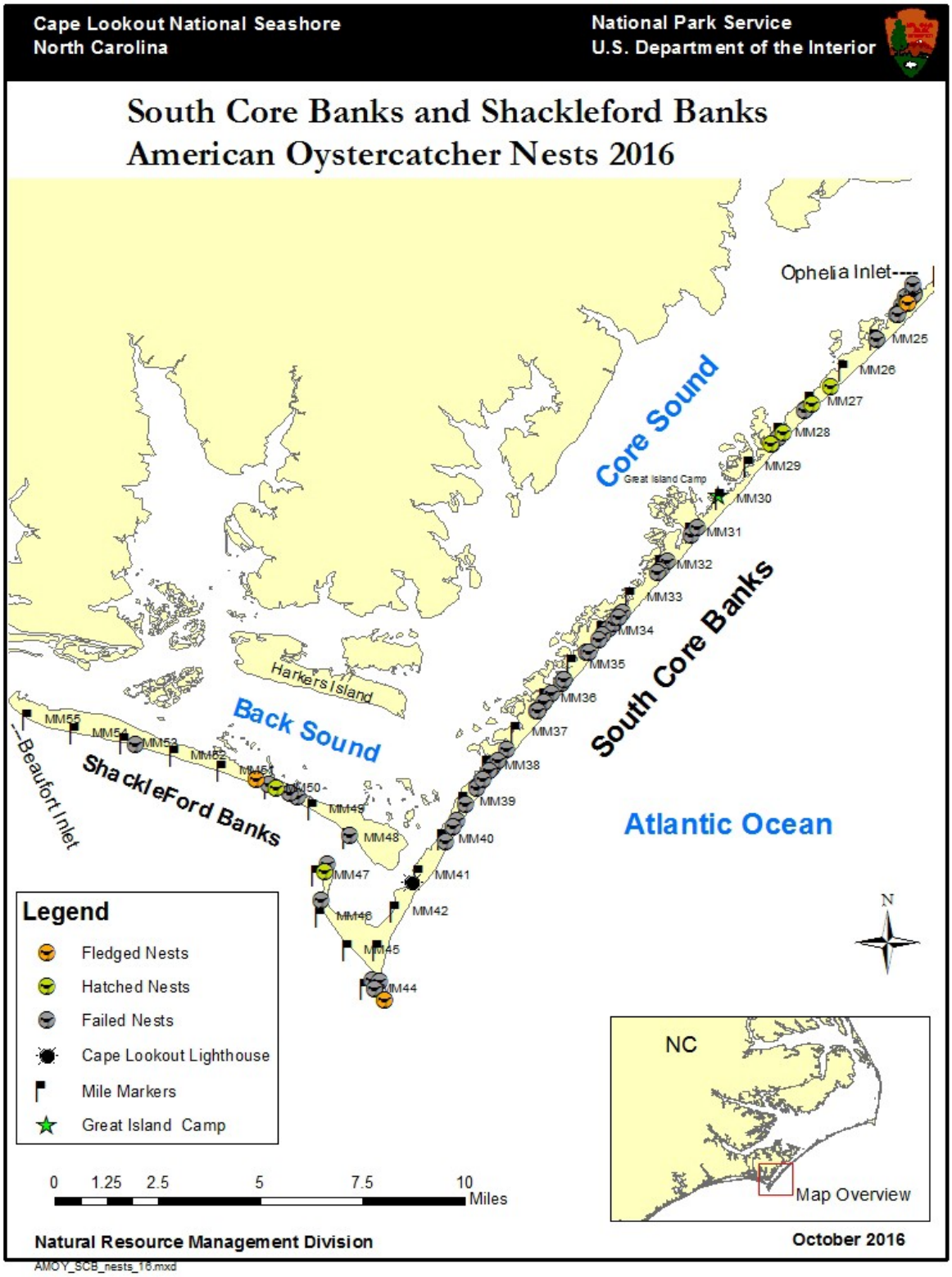
APPENDIX 1B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Harkers Island
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Map Overview
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October 2016
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APPENDIX 2A AMERICAN OYSTERCATCHER NESTS- NORTH CORE BANKS-2016

Nest #	Pair #	Adult Band	Adult Band	Mile	Found	Eggs	Closure	Comments (Abbreviated)
01	01	DG(73)	UNB	9.36	4/10/2016	3	600' buffer	Nest failed: 05/11 - death of adult (unknown cause)
02	02	DG(T6)	DG(CEI)	10.75	4/17/2016	2	600' buffer	Nest failed: 04/22 - Raccoon predation; raccoon tracks at nest
03	03	DG(CE)	UNB	17.64	4/18/2016	3	600' buffer	Nest failed: 05/04 - Cause unknown
04	04	DG(AN)	UNB	22.74	4/19/2016	3	interior	Chicks banded: DG(C2A) & DG(C2C); Considered fledged on day 35; All 3 fledgelings seen with strong flight on 07/02
05	05	DG(M8)	UNB	19.59	4/21/2016	3	interior	Chicks banded: DG(C15) & DG(C16); Considered fledged on day 35; All 3 fledgelings seen with strong flight on 07/02
06	06	UNB	UNB	19.86	4/21/2016	3	interior	Nest failed: 05/11 - Raccoon predation; broken eggshells
07	07	DG(CE7)	DG(F3)	5.85	4/22/2016	3	600' buffer	Brood failed: 05/26 - cause unknown; chicks last seen 05/23
08	08	DG(E0)	UNB	14.22	4/22/2016	3	600' buffer	Nest failed: 05/02 - Raccoon predation; raccoon tracks at nest
09	09	UNB	UNB	6.81	4/23/2016	3	600' buffer	Nest failed: 05/06 - flooded
10	10	DG(TX)	UNB	21.48	4/23/2016	3	interior	Nest failed: 04/30 - Raccoon predation, 04/30 - Adult DG(TX) found dead
11	11	UNB	UNB	0.40	4/25/2016	2	600' buffer	Nest failed: 04/29 - Cause unknown
12	12	UNB	UNB	8.76	4/28/2016	3	600' buffer	Chicks banded: DG(CY5) & DG(CY6); Sustained flight 7/7, Day 42; Both fledgelings seen with strong flight on 07/11

13	13	DG(CE3)	UNB	5.96	4/28/2016	3	600' buffer	Chicks banded: DG(CY8) & DG(CY7); Considered fledged on day 35; (CY7) last seen 07/03 no flight; (CY8) seen with strong flight on 07/07 Day 43;
14	14	DG(CCE)	UNB	7.21	4/29/2016	3	600' buffer	Nest failed: 05/04 - Unknown predator
15	15	DG(CFX)	DG(CY)	3.23	4/29/2016	3	600' buffer	Nest failed: 05/04 - Cause unknown; eggshell fragments near nest cup
16	16	DG(P5)	UNB	22.10	4/30/2016	2	interior	Nest failed: 05/07 - Cause unknown
17	17	DG(RA)	UNB	20.73	5/1/2016	2	MCB	Nest failed: 05/24 - Cause unknown
18	18	UNB	UNB	20.62	5/1/2016	3	interior	Nest failed: 05/11 - Cause unknown; broken egg on beach
19	19	DG(R2)	UNB	19.16	5/1/2016	3	interior	Nest failed: 05/11 - Cause unknown
20	20	DG(W5)	UNB	14.14	5/1/2016	3	600' buffer	Nest failed: 05/06 - Raccoon predation; raccoon tracks to nest
21	21	UR-Red	UNB	12.70	5/2/2016	2	600' buffer	Nest failed: 05/25 - Raccoon predation; raccoon tracks
22	22	DG(TL)	DG(T3)	10.33	5/2/2016	3	600' buffer	Nest failed: 05/28 - Raccoon predation
23	02	DG(T6)	DG(CEI)	10.62	5/4/2016	3	600' buffer	Nest failed: 05/30 - Cause unknown
24	23	DG(PY)	UNB	16.46	5/5/2016	1	600' buffer	Nest failed: 05/06 - Cause unknown
25	11	UNB	UNB	0.50	5/10/2016	2	600' buffer	Nest failed: 06/08 - Cause unknown; 1 chick dead in egg, adults still incubating
26	08	DG(E0)	UNB	14.48	5/14/2016	3	600' buffer	Chick banded: DG(CY9); day 35 fledge,

27	15	DG(CFX)	DG(CY)	3.15	5/14/2016	3	600' buffer	Nest failed: 05/19 - Unknown predator; egg fragment found
28	16	DG(P5)	UNB	22.44	5/15/2016	3	interior	Nest failed: 05/29 - Unknown mammal predator
29	24	UNK	UNK	21.21	5/15/2016	3	MCB	Nest failed: Unknown predator; broken egg on beach
30	03	DG(CE)	UNB	18.47	5/16/2016	3	interior	Nest failed: Unknown mammal predator; nest dug into
31	25	DG(CER)	DG(TN)	18.94	5/16/2016	2	MCB	Nest failed: 06/03 - Cause unknown
32	26	DG(M0)	DG(R2)	19.38	5/16/2016	2	MCB	Nest failed: 06/03 - Cause unknown
33	20	DG(W5)	UNB	13.98	5/17/2016	3	600' buffer	Chicks banded: DG(C18) & DG(C19); Considered fledged on day 43, 7/26; Strong flight on 07/29; Last seen 07/30;
34	14	DG(CCE)	UNB	8.34	5/17/2016	3	600' buffer	Brood failed: 06/16 - Cause unknown; chicks last seen 06/14, adults no longer in area 06/17;
35	09	UNB	UNB	6.81	5/17/2016	3	600' buffer	Nest failed: 05/30 - Cause unknown
36	27	DG(TF)	UNK	21.81	5/19/2016	3	MCB	Nest failed: 05/29 - Cause unknown
37	28	UNB	UNB	1.45	5/21/2016	2	600' buffer	Nest failed: 05/31 - Cause unknown
38	29	DG(CA)	UNB	10.17	5/24/2016	3	600' buffer	Nest failed: 05/28 - Raccoon predation
39	06	UNB	UNB	19.80	5/27/2016	2	MCB	Nest failed: 06/11 - Cause unknown
40	15	DG(CFX)	DG(CY)	3.34	6/1/2016	1	600' buffer	Nest failed: 06/04 - Unknown mammal predator; nest dug into
41	30	DG(73)	DG(RR)	9.19	6/4/2016	2	interior	Nest failed: 06/25 - Raccoon predation

42	24	UNK	UNB	21.46	6/8/2016	2	MCB	Nest failed: 06/13 - Cause unknown
43	02	DG(T6)	DG(CEI)	10.73	6/10/2016	2	600' buffer	Nest failed: 06/13 - Cause unknown
44	31	UNB	UNB	20.12	6/11/2016	2	MCB	Nest failed: 06/27 - Cause unknown
45	09	UNB	UNB	6.84	6/12/2016	2	600' buffer	Nest failed: 06/28 - Cause unknown
46	22	DG(TL)	DG(T3)	10.38	6/13/2016	1	600' buffer	Nest considered abandoned: 06/21 - Cause unknown, egg out of nest cup, covered in sand, and unattended
47	18	UNB	UNB	20.63	6/13/2016	?	MCB	Nest failed: 06/13 - Cause unknown (found failed)
48	25	DG(CER)	DG(TN)	19.08	6/17/2016	2	interior	Nest failed: 06/27 - Cause unknown
49	26	DG(M0)	DG(R2)	19.41	6/17/2016	2	MCB	Nest failed: 06/27 - Cause unknown

31 nesting pairs, 49 nests, 8 nests hatched, 13 chicks fledged

APPENDIX 2B AMERICAN OYSTERCATCHER NESTS- SOUTH CORE BANKS-2016

Nest #	Pair #	Adult Bands	Adult Bands	Mile	Found	Eggs	Closure	Comments (Abbreviated)
01	01	DG(AL)	DG(XX)	23.74	4/11/2016	5	Interior	FAILED - unknown predator
02	02	UL-orange	DG(R8)	38.06	4/11/2016	3	600' buffer	FAILED - unknown predator
03	03	DG(PW)	DG(L2)	39.51	4/11/2016	3	600' buffer	FAILED - coyote
04	04	DG(AR)	DG(AP)	34.94	4/12/2016	2	600' buffer	FAILED - coyote
05	05	DG(JC)	DG(TC)	28.03	4/16/2016	3	600' buffer	HATCHED - 05/16; FAILED - cause unknown
06	06	DG(CP)	UNB	46.41	4/18/2016	2	600' buffer	FAILED - unknown predator
07	07	DG(TE)	UNB	28.39	4/19/2016	3	600' buffer	hatched - coyote (one hatched chick dead outside of nest cup)
08	08	DG(K0)	UNB	31.91	4/19/2016	3	600' buffer	FAILED - coyote
09	09	DG(J0)	DG(M1)	35.56	4/20/2016	3	600' buffer	FAILED - coyote
10	10	UNB	UNB	38.60	4/21/2016	3	600' buffer	FAILED - coyote
11	11	DG(RU)	UNB	34.13	4/21/2016	2	600' buffer	FAILED - coyote
12	12	DG(NF)	UNB	33.48	4/21/2016	3	600' buffer	FAILED - coyote
13	13	DG(33)	DG(LN)	25.07	4/21/2016	3	600' buffer	FAILED - unknown predator

14	14	UNB	DG(J3)	24.00	4/22/2016	3	Interior	FAILED - ghost crab; copulation seen: DG(J3) female
15	15	DG(JH)	R(5F)	40.10	4/22/2016	3	600' buffer	FAILED - coyote
16	02	UL-orange	DG(R8)	37.96	4/24/2016	3	600' buffer	FAILED - coyote
17	16	DG(16)	DG(JA)	44.24	4/25/2016	3	Interior	FAILED - unknown predator
18	17	DG(CF7)	DG(UJ)	27.11	4/26/2016	2	600' buffer	Hatched 5/23, chicks FAILED - unknown
19	18	DG(MC)	UNB	23.88	4/27/2016	3	Interior	FAILED - raccoon
20	19	UNB	UNB	23.65	4/27/2016	3	Interior	FAILED - unknown predator
21	20	DG(J9)	UNB	37.52	4/27/2016	3	600' buffer	FAILED - coyote
22	21	UNB	UR-red	36.42	4/29/2016	3	600' buffer	FAILED - coyote
23	22	DG(LP)	DG(WP)	24.34	4/29/2016	2	Interior	FAILED - unknown predator
24	23	UNB	UNB	47.19	4/30/2016	2	Interior	HATCHED - 06/03; FAILED - cause unknown
25	24	UNB	UNB	31.13	5/2/2016	3	600' buffer	FAILED - coyote
26	25	DG(YP)	UNB	34.67	5/2/2016	3	600' buffer	FAILED - coyote
27	26	DG(CEF)	UNB	27.29	5/4/2016	3	600' buffer	FAILED - unknown predator
28	08	DG(KO)	UNB	32.19	5/4/2016	3	600' buffer	FAILED - unknown predator

29	27	DG(AL)	UNB	23.71	5/5/2016	1	Interior	FAILED - unknown predator
30	14	DG(J3)	UNB	23.99	5/8/2016	3	Interior	FAILED - ghost crab
31	28	DG(CFA)	UNB	26.54	5/9/2016	2	600' buffer	HATCHED - 06/07; FAILED - unknown cause
32	18	DG(MC)	UNB	23.80	5/10/2016	3	Interior	FAILED - ghost crab
33	21	UNK	UNK	35.90	5/10/2016	3	600' buffer	FAILED - unknown predator; found failed
34	27	DG(AL)	UNB	23.70	5/13/2016	1	Interior	FAILED - unknown predator
35	4	DG(AR)	DG(AP)	33.77	5/13/2016	2	600' buffer	FAILED - coyote
36	12	DG(NF)	UNB	33.47	5/14/2016	2	600' buffer	FAILED - unknown predator
37	06	DG(CP)	UNB	44.38	5/14/2016	2	Interior	HATCHED - 06/03; FAILED - coyote ate Chick/fledgling on 7/12, day 39,after banded DG (CYO) on 7/8
38	27	DG(AL)	UNB	23.73	5/16/2016	2	Interior	FAILED - ghost crab
39	20	DG(J9)	UNB	37.86	5/16/2016	3	600' buffer	FAILED - unknown predator
40	22	DG(LP)	DG(WP)	24.32	5/17/2016	2	Interior	FAILED - unknown predator
41	10	UNB	UNB	38.62	5/17/2016		600' buffer	FAILED - unknown predator
42	29	DG(R8)	UNB	38.12	5/17/2016	2	600' buffer	FAILED - unknown predator
43	13	DG(33)	DG(LN)	25.08	5/18/2016	3	600' buffer	FAILED - coyote

44	03	DG(PW)	DG(L2)	39.70	5/18/2016	2	600' buffer	FAILED - coyote
45	07	DG(TE)	UNB	28.36	5/23/2016	2	600' buffer	FAILED - raccoon
46	30	DG(KR)	UNB	28.17	5/23/2016	2	600' buffer	FAILED - raccoon
47	24	UNB	UNB	30.90	5/23/2016	3	600' buffer	FAILED - unknown predator
48	10	UNB	UNB	39.10	5/23/2016	2	600' buffer	FAILED - raccoon
49	31	DG(UL)	UNB	43.77	5/24/2016	2	Interior	FAILED - unknown predator
50	21	UR-Red	UNB	36.15	5/24/2016	3	600' buffer	FAILED - coyote
51	09	DG(M1)	DG(JO)	35.46	5/25/2016	3	600' buffer	FAILED - coyote
52	32	DG(NA)	DG(CC6)	47.28	5/26/2016	1	Interior	FAILED - unknown predator
53	16	DG(JA)	DG(16)	44.00	5/26/2016	2	Interior	FAILED - washover
54	25	DG(YP)	UNB	34.63	5/26/2016	2	600' buffer	FAILED - coyote
55	33	DG(CE4)	UNB	23.57	5/27/2016	2	Interior	FAILED - unknown predator
56	11	DG(RU)	UNB	34.25	5/29/2016	2	600' buffer	FAILED - unknown cause
57	12	DG(NF)	UNB	33.44	5/29/2016	2	600' buffer	FAILED - unknown predator
58	29	DG(AP)	DG(AR)	33.59	6/9/2016	2	600' buffer	FAILED - coyote
59	10	UNB	UNB	38.38	6/10/2016	1	600' buffer	FAILED - nest searching accident

60	21	UR-red	UNB	36.39	6/11/2016	1	600' buffer	FAILED - unknown predator
61	09	DG(M1)	DG(JO)	35.48	6/13/2016	2	600' buffer	FAILED - coyote
62	14	DG(J3)	UNB	23.98	6/14/2016	2	Interior	HATCHED - 07/09; FLEDGED 2 chicks DG (C11) and DG (C12) 08/13; Last seen 08/28 with strong flight
63	26	DG(CEF)	UNB	27.31	6/16/2016	2	600' buffer	FAILED - nest abandoned, unknown cause
64	08	DG(KO)	UNB	32.26	6/17/2016	3	600' buffer	FAILED - unknown predator

33 nesting pairs, 64 nests, 7 nests hatched, 3 chicks fledged

APPENDIX 2C AMERICAN OYSTERCATCHER NESTS- SHACKLEFORD BANKS -2016

Nest #	Pair #	Adult Bands	Adult Bands	Mile	Found	Eggs	Closure	Comments (Abbreviated)
1	1	UNB	UNB	50.45	4/19/2016	2	none	Chicks initially on ocean beach , then moved to soundside mudflat, 1 chick fledged
2	2	UNK	UNK	52.89	4/26/2016	2	none	Unknown nest loss
3	3	UNK	UNK	50.15	4/19/2016	3	none	Unknown nest loss
4	4	UNB	UNB	49.68	5/2/2016	3	none	Unknown nest loss
5	5	UNK	UNK	49.53	5/9/2016	2	none	Unknown nest loss
6	3	UNK	UNK	50	5/20/2016	3	none	Unknown chick loss, chicks seen on Oceanside
7	6	UNB	UNK	49.91	5/20/2016	2	none	foot prints and horse prints at nest, lots of footprints from boat landing directly in front of nest, nest lost
8	4	UNB	UNK	49.7	5/20/2016	2	none	unknown

6 nesting pairs, 8 nests, 2 nests hatched, 1 chick fledged