ROSEATE SPOONBILL NESTING IN FLORIDA BAY ANNUAL REPORT 2009-2010

Methods

Spoonbill Colony Surveys

Forty of the Keys in Florida Bay have been used by Roseate Spoonbills as nesting colonies (Table 1). These colonies have been divided into five distinct nesting regions based on the primary foraging locations utilized by the birds nesting in each region (Figure 1, Lorenz et al. 2002). During the 2009-10 nesting season (Nov 2009-May 2010), complete nest counts were performed in all five regions of the bay by entering the colonies and thoroughly searching for nests. Nesting success was estimated for four of the five regions through mark and revisit surveys at the most active colony or colonies within each region (hereafter referred to as focal colonies). These surveys entailed marking up to 60 nests shortly after full clutches had been laid, and then revisiting the colonies on a seven to ten-day cycle. Nests were monitored until failure or until all surviving chicks reached at least 21 days of age, the age at which chicks begin branching and can no longer be assigned to a nest. A colony was considered successful if it averaged at least one chick to 21 days per nesting attempt (c/n). Mean laying and hatching dates refer to the first egg laid in each clutch and the first egg to hatch in each clutch. We present our results in the context of spoonbill nesting activities in Florida Bay since 1984, the year that the South Dade Conveyance System (SDCS), which has direct water management implications on Florida Bay, was completed (Lorenz 2000, Lorenz et al. 2002).

Banding Program

The purpose of the banding program is to further our understanding of the movements and population dynamics of the spoonbill population in Florida. Specifically, we are interested in determining to where breeding birds disperse during the non-breeding season, the possibility of breeding bird exchanges between Florida Bay and other breeding locations around the state, and state-wide regional movements of the entire population. We also use resights of chicks banded this season, prior to abandoning their natal colonies, as a metric to support our survival estimates from our nesting surveys. The survival estimates from the banding program tend to be lower than the nesting survey estimates due to the dense foliage in which the birds often hide after leaving their nests. Because of this bias, we use the nesting surveys to assess nesting success. However, the resight data does provide qualitative, supporting evidence as to whether nest production was high, moderate, or poor. Please refer anyone with information on banded spoonbills to the senior author or our website:
(http://www.audubonofflorida.org/who_tavernier_reportspoon bills.html).

In Florida Bay, spoonbill nestlings were banded at six of the 12 colonies that were active this season (Table 2). These six colonies were distributed among four of the five regions as follows: Northwest (n = 1), Northeast (n = 2), Southeast (n = 1), and Central (n = 2). Three of the colonies in the Northwest region can experience heavy predation by American Crows when disturbed by humans, and have therefore been omitted from the banding program. Details of our banding procedures are described in the Roseate

Spoonbill section of the 2007 South Florida Wading Bird Report, with the one exception that, starting in the 2008-09 season, we changed to a new type of alphanumeric band. The new bands come in a variety of colors, and it is therefore no longer necessary to use the colored celluloid bands to designate the region in which the bird was banded.

Spoonbill Monitoring Results

Northwest Region: Sandy Key

All five colonies within the Northwest region were surveyed in 2009-10, and three of these were active. We counted a total of 177 nests, which is well below the mean of 217 nests over the last 25 years (Table 1). Nesting surveys were conducted at Sandy Key on Oct 23, Nov 11, 23, Dec 7, 15, 22, 31, Jan 7, 13, 20, 28, Feb 8, 17, 23, Mar 4, 15, Apr 7, and May 26. We estimate that the earliest nests were initiated on Nov 1 and the latest on Jan 7. The mean lay date was Dec 13 and the mean hatch date was Jan 4 (Table 3). The number of nests found on Sandy Key this season (n = 83) was well below the mean of 152 since 1984-85 (Table 1). We marked 60 nests for revisitation, but were able to follow the outcome of only 47 nests due to the composition of the colony. Of those 47, only 43% were successful, producing a mean of 0.60 c/n (Table 4). Total production for Sandy Key was estimated at 50 young (Table 3). Actual production, however, was likely much lower. On 4 Mar, towards the end of the nesting cycle, a total of only nine fledglings were observed on the island, while an additional 14 large young were found dead in the water below the nests. This indicated that a significant number of chicks died shortly after reaching the 21-day mark.

Our banding results further support a failure late in the nesting cycle. We banded 13 nestlings from nine nests at Sandy Key on Dec 22 and Dec 31 (Table 2). Only five (38%) of the banded chicks were resighted as fledglings before abandoning their natal colony, providing a minimum production estimate of 0.55 c/n (5 chicks from 9 nests). Seven (54%) of the banded chicks were confirmed dead.

This season, Sandy Key exhibited two distinct nesting periods. During the first wave, nests initiated between 1 Nov and 7 Dec, (n=29 nests monitored), 76% of the nests failed while only 24% were successful. In contrast, during the second wave, nests initiated between 26 Dec and 7 Jan (n=18 nests monitored), 72% of the nests were successful while only 28% failed.

Northeast Region: Duck Key

All nine spoonbill nesting colonies were surveyed in the Northeast region, only three of which were active. The nest count of 41 was well below the average of 175 nests since 1984-85, and the lowest nest count for the region during that period. Ninety percent of the nests initiated in the region (n=37) were located on Duck Key.

Spoonbill nesting surveys were conducted at Duck Key on Oct 5, 27, Nov 16, 30, Dec 14, 21, Jan 2, 14, 21, 27, Feb 2, 12, 20, Mar 1, 9, 19, and Apr 2 and 29. We estimate that the first nests were initiated on Jan 10 and the last on Jan 28, with a mean lay date of Jan 20 and a mean hatch date of Feb 12 (Table 3).

The Duck Key colony was not successful, producing an average of only 0.53 c/n (Table 4). Only thirty-seven percent of the nest attempts were successful. Total production for the colony was estimated at 20 young (Table 3), but like Sandy Key, many of those young likely did not successfully fledge. Only six or seven fledglings were ever observed within the colony. Our banding results further support a lack of fledged young. Seven nestlings were banded from four nests within two colonies (Deer and Duck Keys; Table 2) in the Northeast region. None of the banded chicks was ever observed as a fledgling, and three (43%) of the banded chicks were confirmed dead.

Southeast Region: Stake Key

All 12 of the Southeast colonies were surveyed for nesting activity in 2009-10, only two of which were active (Table 1). Only five nests were initiated in the region, well below the mean of 76 nests since 1984-85 (Table 4). Four of the five nests were located on Stake Key.

Nesting surveys were conducted at Stake Key on Oct 2, 20, Nov 2, 19, Dec 9, 16, 21, Jan 15, 21, 29, Feb 10, Mar 1, 24, and Apr 23. At Stake Key, we estimate that the first nests were initiated on Jan 16 and the last on Jan 18, with a mean lay date of Jan 17 and a mean hatch date of Feb 9 (Table 3).

We were able to determine the fate of only two of the five nests on Stake Key, both of which failed, for a mean of 0.0 c/n (Table 4). No chicks were banded in the Southeast region this season.

A small second nesting event (n=3) occurred at Bottle Key in April. Only one nest was successful, producing 3 chicks. Two chicks were banded and, at last check, these chicks were 28 days of age but not yet capable of sustained flight.

Central Region: Calusa and First Mate Keys

All ten of the Central colonies were surveyed for nesting activity in 2009-10, three of which were active. Only nine nests were initiated, extremely low when compared to the mean of 52 nests since 1984-85 (Table 1).

Nesting surveys were conducted at Calusa Key on Oct 1, 21, Nov 3, 24, Dec 8, 15, 22, 31, Jan 8, 29, Feb 18, Mar 23, Apr 6, 23, and May 10, 21, 27 and at First Mate Key Oct 2, 21, Nov 5, 19, Dec 9, Jan 5, 26, Feb 10, 23, Mar 4, 23, 29, and Apr 6, 23. At Calusa Key, we estimate that the first nests were initiated on Nov 9 and the last on Nov 21, with a mean lay date of Nov 15 and a mean hatch date of Dec 8 (Table 3). At First Mate Key, lay date estimates were only possible at one nest. That nest initiated approximately Jan 30 and hatched approximately Feb 22.

Five nests on Calusa Key and three nests on First Mate Key were monitored, all of which failed to produce young. Thus, for the region as a whole, productivity was 0.0 c/n and no chicks fledged. Two nestlings were banded from two nests within two colonies (Calusa and North Jimmie Keys; Table 2) in the Central region and both (100%) were confirmed dead.

A small second nesting event (n=2) occurred at Calusa Key in April. Both nests were successful and together produced three young.

Southwest Region: Twin Key
All four colonies in the Southwest region were surveyed in 2009-10 but only one, Twin Key, was active (Table 1). All four colonies in the Southwest region were surveyed but only one, Twin Key, was active (Table 1). One nest was initiated on Twin Key but the fate of the nest is unknown.

Bay-wide Synthesis
Overall, spoonbill nests in Florida Bay were initiated later than usual this season. The mean lay date at Sandy Key each season since 2002-03 fell between 2 Nov and 2 Dec, considerably earlier than the mean lay date of 13 Dec in 2009-10 (Table 3). Similarly, the mean lay dates in the Northeast and Southeast regions in all seasons since 2002-03 fell between mid November and late December, compared with 20 Jan and 17 Jan, respectively, in the 2009-10 season (Table 3). While productivity was extremely low overall, those nests that were initiated later in the season at Sandy Key were considerably more successful than those initiated during the first wave of nests. Spoonbills time their nesting to coincide with the annual drawdown during the Florida Bay dry season. The unusually high water levels on the spoonbill foraging grounds this season and the resulting lack of concentrated prey likely led to the delayed, and ultimately unsuccessful, nesting baywide. The extreme cold event in early to mid-January may have played a role in the low nesting effort and productivity as well.

In all, only 24 chicks were banded from 16 nests across Florida Bay. Of those, 12 (50%) were found dead, and only seven (29%) were observed as fledglings before leaving their natal colonies (Table 2). Between March 2003 and April 2009, 1678 nestlings were banded with a colored, alphanumeric band in Florida Bay. As of July 16, 2010, 108 (6%) have been resighted. In comparison, between April 2003 and May 2009, 1061 spoonbill nestlings were banded within nesting colonies in the Tampa Bay region. As of July 16, 2010, 242 (23%) of those 1061 banded birds have been resighted. These data continue to demonstrate that Florida Bay is no longer the principal source location for spoonbill recruitment into Florida's breeding population. Bay-wide, the Roseate Spoonbill nesting effort in 2009-10 was the lowest year on record since the completion of the SDCS in 1984 (n=233 nests; Table 1), indicating a continued downward trend.

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Lorenz, J.J., J.C. Ogden, R.D. Bjork, and G.V.N. Powell. 2002. Nesting patterns of Roseate Spoonbills in Florida Bay 1935-1999: Implications of landscape scale anthropogenic impacts. Pp. 563-606 *in* J.W. Porter and K.G. Porter (eds.). The Everglades, Florida Bay, and coral reefs of the Florida Keys: An ecosystem sourcebook. CRC Press, Boca Raton, FL.

Table 1. Number of Roseate Spoonbill nests in Florida Bay November 2009 through March 2010. An asterisk indicates a colony where nesting success surveys were conducted. Second nesting attempts are not included.

			Summary since 1984-85		
Region	Colony	2009-10	Min	Mean	Max
Northwest	Clive	7	6	24	52
	Frank	0	0	50	125
	Oyster	0	0	6	45
	Palm	87	9	30	62
	Sandy*	83	62	152	250
	Region Subtotal	177	65	217	325
Northeast	Deer	2	2	7	15
	Duck*	37	0	10	100
	Little Betsy	0	4	13	21
	N. Nest	0	0	1	8
	North Park	0	0	17	50
	Pass	0	0	1	7
	Porjoe	0	0	27	118
	South Nest	2	0	20	59
	Tern	0	0	100	184
	Region Subtotal	41	44	175	333
Southeast	Bottle	0	0	11	40
	Cotton	0	0	0	0
	Cowpens	0	0	6	15
	Crab	0	0	2	8
	Crane	0	0	12	27
	East	0	0	3	13
	East Butternut	0	0	6	27
	Low	0	0	0	0
	Middle Butternut	1	1	20	66
	Pigeon	0	0	10	56
	Stake*	4	0	6	19
	West	0	0	3	9
	Region Subtotal	5	39	76	117
Central	Calusa*	5	0	12	21
	Captain	0	1	4	9
	East Bob Allen	0	0	13	35
	First Mate*	3	1	6	15
	Jimmie Channel	0	6	19	47
	Little Jimmie	0	0	4	12
	Manatee	0	0	0	3
	North Jimmie	1	2	2	2
	Pollock	0	0	2	13
	South Park	0	0	11	39
	Region Subtotal	9	15	52	96
Southwest	Barnes	0	0	0	3
	East Buchanan	0	0	6	27
	Twin	1	0	2	8
	West Buchanan	0	0	3	9
	Region Subtotal	1	0	10	35
	Florida Bay Total	233	316	530	880

Table 2. Roseate Spoonbill chicks banded in Florida Bay between December 2009 and May 2010.

Region	Colony	Number of nests banded	Number of chicks banded	Number resighted as fledglings	Percent resighted as fledglings	Number found dead	Percent found dead	Number with unknown fate	Percent with unknown fate
Northwest	Sandy	9	13	5	38%	7	54%	1	8%
Northeast	Deer	2	3	0	0%	0	0%	3	100%
	Duck	2	4	0	0%	3	75%	1	25%
	Subtotal	4	7	0	0%	3	43%	4	57%
Southeast	Bottle	1	2	2	100%	0	0%	0	0%
Central	Calusa	1	1	0	0%	1	100%	0	0%
	North Jimmie	1	1	0	0%	1	100%	0	0%
	Subtotal	2	2	0	0%	2	100%	0	0%
	Florida Bay Total	16	24	7	29%	12	50%	5	21%

Table 3. Estimated dates of nesting events for focal colonies surveyed in the 2009-10 nesting season. A refer to the first egg laid in each clutch or the first egg to hatch in each clutch. The estimated number of chicks fledged from each colony is also presented.

		Nest Initiation Dates				
Region	Colony	Earliest Nest	Latest Nest	Mean Lay	Mean Hatch	Est. # of chicks fledged
Northwest	Sandy	1-Nov-09	7-Jan-10	13-Dec-09	4-Jan-10	50
Northeast	Duck	10-Jan-10	28-Jan-10	20-Jan-10	12-Feb-10	20
Southeast	Stake	16-Jan-10	18-Jan-10	17-Jan-10	9-Feb-10	0
Central	Calusa	9-Nov-09	21-Nov-09	15-Nov-09	8-Dec-09	0

Table 4. Mean number of chicks to 21 days per nesting attempt and the percentage of nests that were successful. Success is defined as a mean of at least one chick to 21 days per nesting attempt. Summary figures refer to the focal colony or colonies surveyed in each year. Numbers in parentheses indicate how many years each region. has been surveyed since 1984-85. Second nesting attempts are not included.

				Summary since 1984-85			
Region	Colony	2009-10 Nesting Season		Min	Mean	Max	% Years Successful
Northwest	Sandy	0.60	43%	0.00	1.31	2.50	68% (n=22)
Northeast	Duck	0.53	37%	0.00	0.89	2.20	50% (n=22)
Southeast	Stake	0.00	0%	0.14	1.07	2.09	50% (n=12)
Central	Calusa	0.00	0%				
	First Mate	0.00	0%				
	Region Total	0.00	0%	0.00	0.93	1.86	42% (n=12)

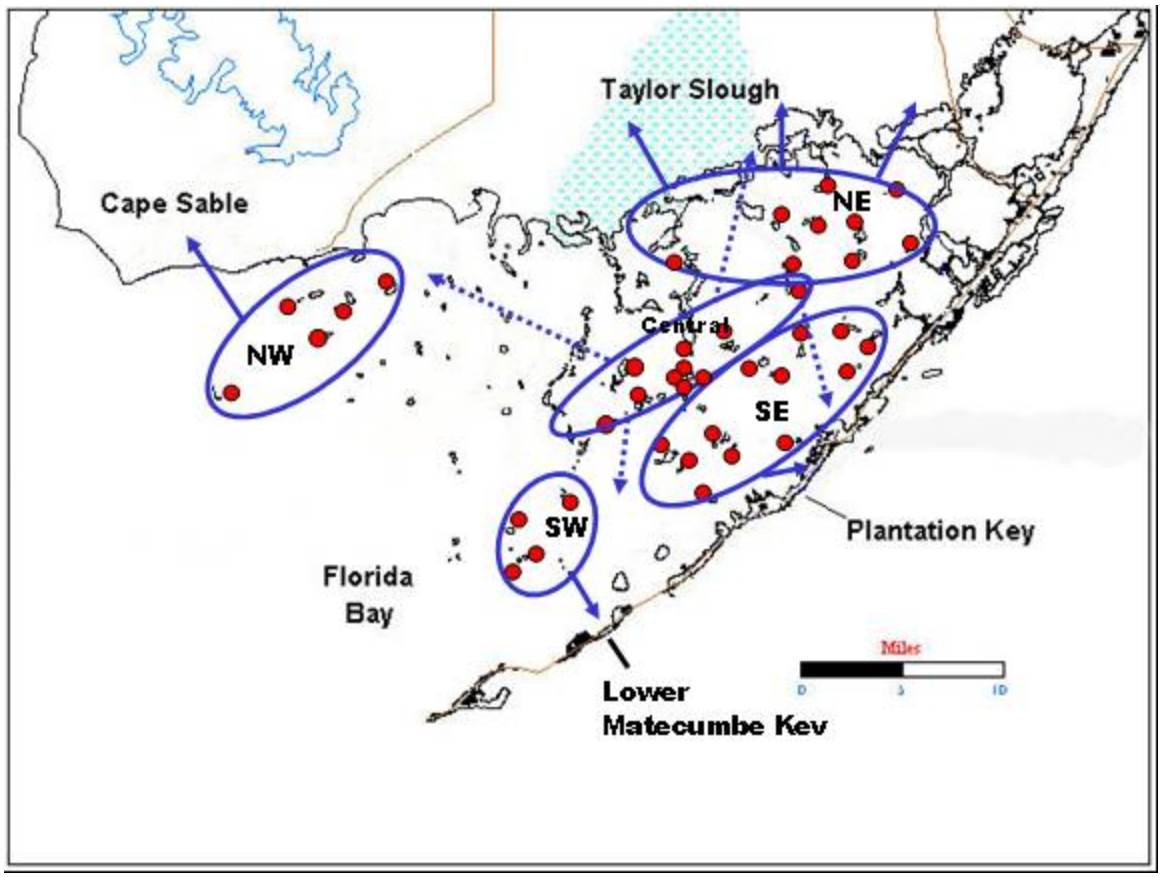

Figure 1. Map of Florida Bay indicating spoonbill colony locations (red circles) and nesting regions (blue circles). Arrows indicate the primary foraging area for each region. The dashed lines from the central region are speculative.