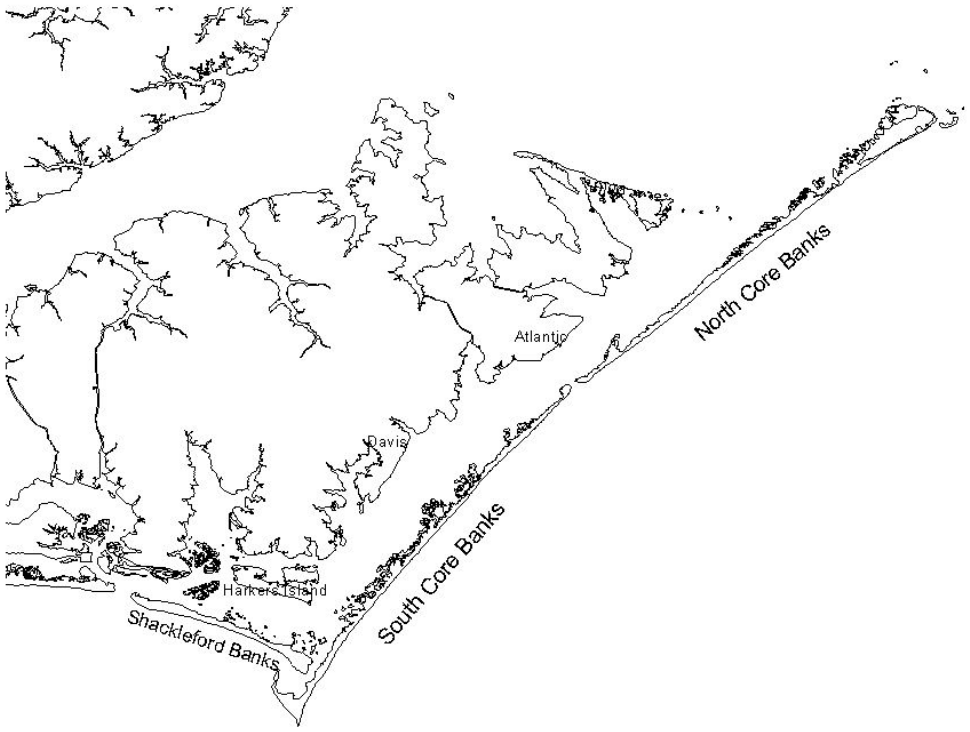
RED KNOT (*Calidris canutus*) MONITORING AT CAPE LOOKOUT NATIONAL SEASHORE

2008 SUMMARY REPORT



NATIONAL PARK SERVICE
CAPE LOOKOUT NATIONAL SEASHORE
131 CHARLES STREET
HARKERS ISLAND, NC 28531

Introduction

Serious declines in the population of red knots (*Calidrus canutus*) led to several petitions to the U.S. Fish and Wildlife Service for protection under the Endangered Species Act. In September 2006 the red knot was designated as a candidate for Endangered Species Act protection (Federal Register, 2006). Red knots use the Outer Banks of North Carolina as a stopover site in spring and fall migration. While not as important as some other coastal sites, the Outer Banks may still contribute to the survival of this species.

Previous monitoring of red knots at Cape Lookout National Seashore (CALO) was limited to surveys as part of a broader shorebird study in 1992 and 1993. North Core Banks had greater numbers of red knots than other areas in the Outer Banks (Dinsmore and Collazo, 1995) but surveys in that study did not include any of the areas south of New Drum Inlet.

This report contains a summary of monitoring results for 2008 and comparisons to results from the earlier study and discussions of long-term monitoring of red knots at CALO.

Methods

Surveys for red knots were made of the entire ocean beach and inlet areas on North Core Banks, South Core Banks and Shackleford Banks beginning in mid-March. The area between Old Drum Inlet and Ophelia Inlet was not monitored (Figure 1).

Our survey frequency and timing followed the International Shorebird Census guidelines for spring and fall. Counts were done near the 5^{th,} 15^{th,} and 25th of the month from March 15th to June 15th and from July 15th to October 15th.

Surveys were conducted by the park biologist or biological science technicians with experience identifying shorebirds. Surveys were at different times of day, tides and weather conditions. Monitors recorded the number of red knots observed, the mile location, the latitude and longitude, the amount of human disturbance, tide level and the accuracy of the count (See Appendix 1).

Results

Most of the red knots counted during our surveys were found on North Core Banks with an average of 156 birds. South Core Banks averaged 69 birds and Shackleford Banks only had one count of 96 birds on 5-April. The peak numbers were during spring migrations with 1291 birds counted on the April 15 census and 1051 birds on 5 May. The spring migration from 15 March to 5 June averaged 460 birds. There was also a small peak in August and October when fall migrants moved through (Figure 2). The fall migration from 15 July to 25 October averaged 36 birds. No banded red knots were observed during our surveys. Red knots were distributed over the length of the seashore (Figure3).

Discussion

Our monitoring confirmed the importance of the seashore as a stopover site for red knots, particularly during spring migration. The relative abundance of red knots on North Core Banks during peak spring migration was 44 birds/kilometer compared to 34 birds/kilometer in 1992-1993. This comparison does take into account the loss of 4.8km of census data due to Old Drum Inlet. The 1992-1993 study censused 34 km, were as North Core Banks length was 29.2 km in 2008. The island likely has the greatest number of knots in the Outer Banks. Although the Outer Banks may not be as important as some other sites in the region, the area still provides habitat that may be important for the recovery and long-term survival of red knots.

The methods used in this study would be easy to replicate with just a few trained monitors. Red knot surveys should continue to be integrated into the park's long-term monitoring program.

Table 1. Red knot relative abundance on North Core Banks, 1992-2008.

Year	Date	Peak Count	Kilometer	Abundance
1992-1993			34	34
2006	5-May	618	29.2	21
2007	15-May	718	29.2	24
2008	15-Apr	1287	29.2	44

Literature Cited

Dinsmore, S.J. and J.A. Collazo. 1995. Seasonal numbers, distribution and population dynamics of shorebirds on the outer banks of North Carolina. In Factors Affecting Reproduction and Migration of Waterbirds on the North Carolina Barrier Islands. Final Report to the National Park Service.

Figure 1. Areas Surveyed for Red Knots

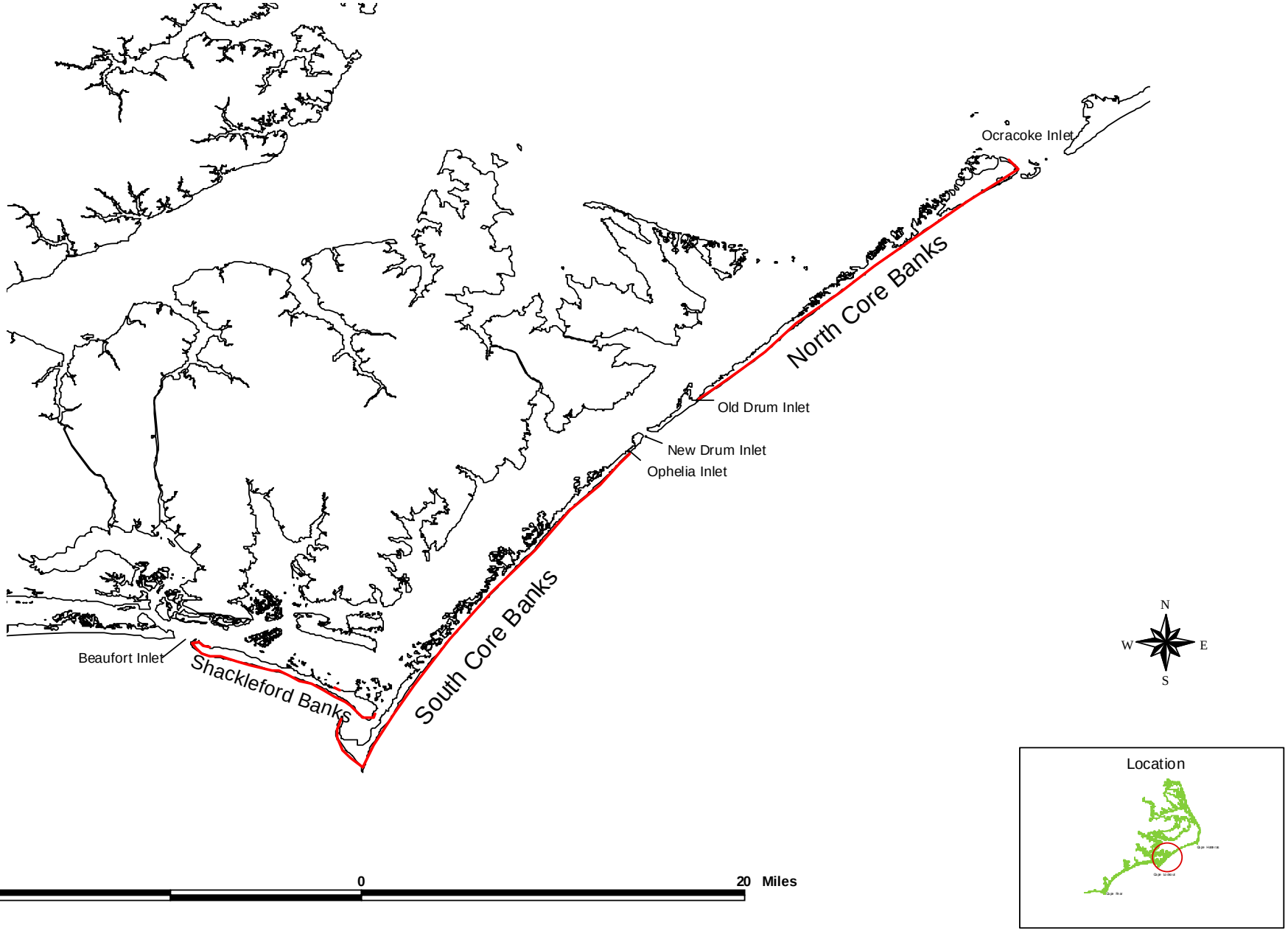


Figure 2. Number of Red Knots Counted at Cape Lookout National Seashore in 2008

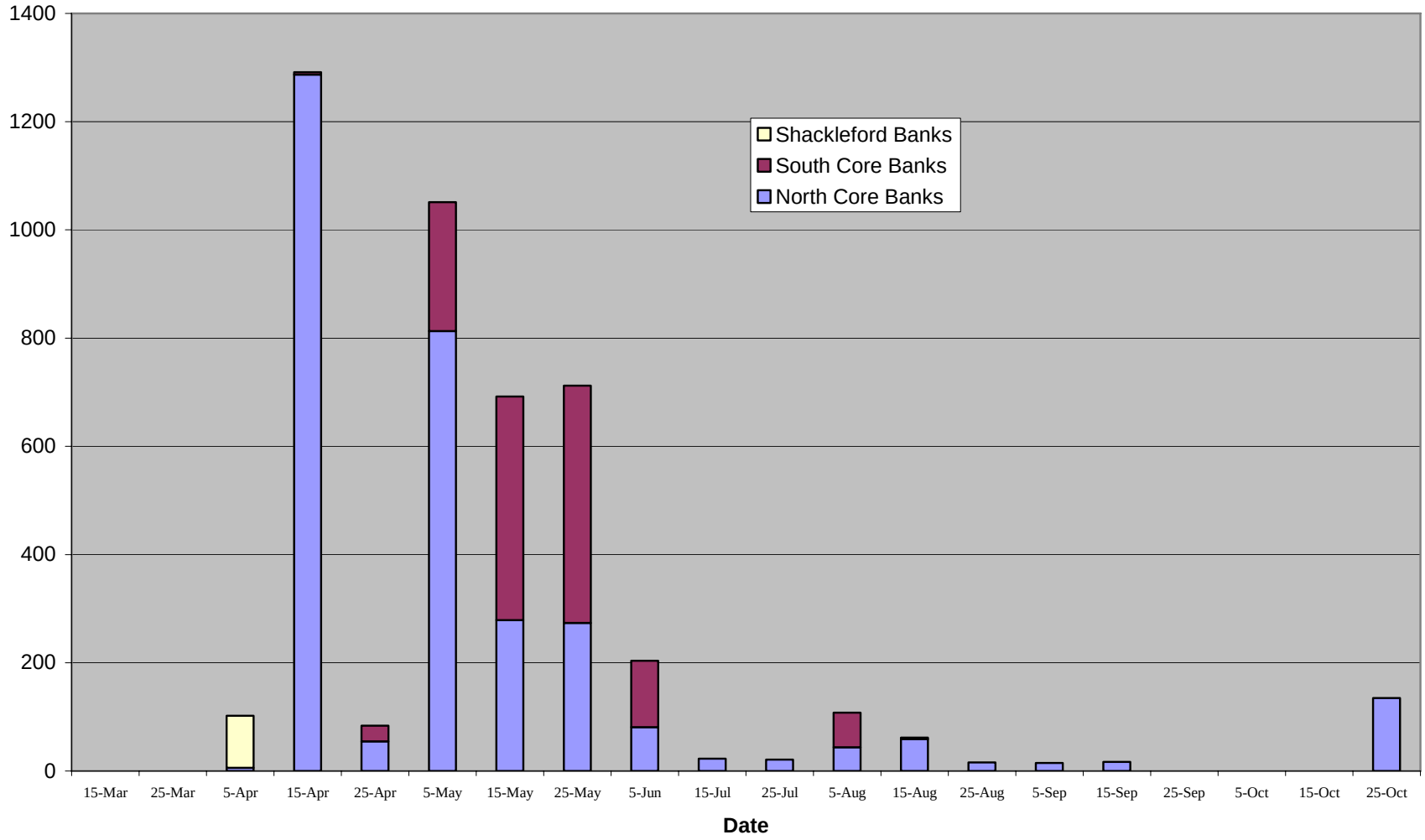
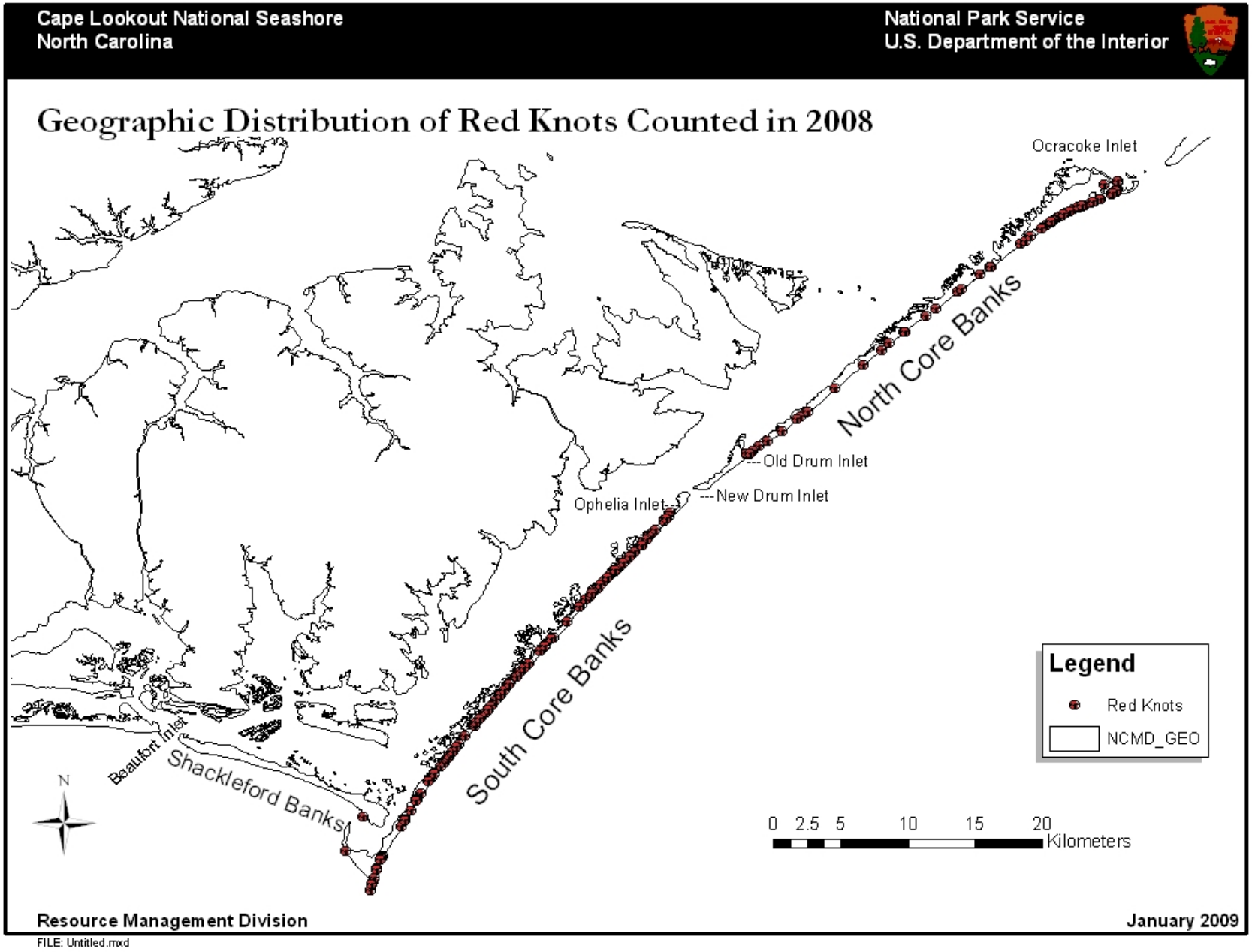


Figure 3. Geographic Distribution of Red Knots Counted in 2008.



Appendix 1

RED KNOT (*Calidris canutus)* SURVEY DATA SHEET
Cape Lookout National Seashore

Name of Observer:_____

Date_____ Island_____

# of REKN	Mile	Latitude (decimal degrees)	Longitude (decimal degrees)	Human Disturbance	Tide	Accuracy

Human disturbance: During this census, shorebirds were:
A=undisturbed, B=disturbed 1-2 times, C=3-4 times, D=5-10 times, E=>10 times, X= unknown

TIDE (coastal sites): 1=high, 2=near high/RISING, 3=near high/ FALLING,
4=half/RISING,5=half/FALLING, 6=near low/RISING, 7=near low/FALLING, 8=LOW, 9=unknown.

ACCURACY: Please indicate in each block whether your count is:
* a true count, ** an extrapolated estimate, or circle a "guestimate"

Appendix 2. 2008 Red Knot Survey Data

Month	Day	Observer	Island	REKN	Mile	Latitude	Longitude	Disturbance	Tide	Accuracy
3	13	Altman	NCB	0				X	8	*
3	14	Altman	SCB	0				X	4	*
3	14	Altman	SB	0				X	8	*
3	25	Altman	NCB	0				X	3	*
3	26	Altman	SCB	0				X	5	*
4	4	Altman	NCB	6	18.5	34.87948	-76.28163	A	1	*
4	4	Altman	SCB	0				X	6	*
4	8	Altman	SB	96	48	34.63637	-76.54055	B	7	*
4	16	Altman	NCB	12	19	34.87889	-76.28215	A	6	*
4	16	Altman	NCB	375	2.2	35.04307	-76.06534	A	7	**
4	16	Altman	NCB	500	1.8	35.0462	-76.05742	A	7	**
4	16	Altman	NCB	400	0	35.05667	-76.03558	A	7	**
4	16	Altman	SCB	4	40.4	34.63449	-76.51237	C	4	*
4	22	Altman	SCB	4		34.63449	-76.51237	C	4	*
4	25	Altman	NCB	20	19	34.8786	-76.28379	B	4	*
4	25	Altman	NCB	19	15.8	34.90657	-76.24445	A	4	*
4	25	Altman	NCB	16	4.12	34.02668	-76.09148	A	4	*
4	25	Ertolacci	SCB	4	27.51	34.789	-76.38459	A	5	*
4	25	Ertolacci	SCB	25	43.6	34.59249	-76.53438	B	3	*
5	5	Altman	NCB	38	18.5	34.88413	-76.27548	C	7	*
5	5	Altman	NCB	11	3.52	35.03236	-76.08346	C	7	*
5	5	Altman	NCB	375	2.93	35.03736	-76.07597	C	7	**
5	5	Altman	NCB	150	2.68	35.03985	-76.07176	C	7	**
5	5	Altman	NCB	225	2.55	35.04077	-76.06982	C	7	**
5	5	Altman	NCB	14	1.75	35.04609	-76.05743	C	7	*
5	5	Ertolacci	SCB	34	25.62	34.80992	-76.36304	A	1	*
5	5	Ertolacci	SCB	22	26.06	34.80488	-76.36784	B	1	*
5	5	Ertolacci	SCB	10	26.89	34.79591	-76.37762	A	1	*
5	5	Ertolacci	SCB	4	27.3	34.79145	-76.3822	A	1	*
5	5	Ertolacci	SCB	13	27.65	34.78744	-76.38609	A	1	*
5	5	Ertolacci	SCB	5	30.8	34.7509	-76.41897	B	1	*
5	5	Ertolacci	SCB	2	33.62	34.71789	-76.44852	A	1	*
5	5	Ertolacci	SCB	1	33.71	34.71679	-76.44947	A	1	*
5	5	Ertolacci	SCB	30	35.03	34.7012	-76.46306	B	1	**
5	5	Ertolacci	SCB	10	37.49	34.67185	-76.48748	C	1	*
5	5	Ertolacci	SCB	8	37.67	34.66979	-76.4893	A	1	*
5	5	Ertolacci	SCB	16	42.35	34.60984	-76.5277	B	1	*
5	5	Ertolacci	SCB	36	42.41	34.60907	-76.52822	B	1	*
5	5	Ertolacci	SCB	6	42.47	34.60826	-76.52864	A	1	*
5	5	Ertolacci	SCB	38	42.57	34.60692	-76.52934	B	1	*
5	5	Ertolacci	SCB	3	44.04	34.5864	-76.53567	A	1	*
5	15	Altman	NCB	7	19	34.88011	-76.28075	C	3	*
5	15	Altman	NCB	35	18	34.88818	-76.26981	C	3	*
5	15	Altman	NCB	23	16.37	34.9042	-76.24765	C	3	*

5	15	Altman	NCB	5	12	34.94889	-76.19361	C	3	*
5	15	Altman	NCB	14	10.8	34.96101	-76.17861	B	5	*
5	15	Altman	NCB	39	9.72	34.9717	-76.16404	B	5	*
5	15	Altman	NCB	69	6.38	35.00471	-76.121	B	5	*
5	15	Altman	NCB	13	4.8	35.02017	-76.10043	B	5	*
5	15	Altman	NCB	17	3.36	35.3392	-76.08121	B	5	*
5	15	Altman	NCB	29	2.75	35.0393	-76.0729	B	5	*
5	15	Altman	NCB	28	0.05	35.05489	-76.03727	A	5	*
5	15	Ertolacci	SCB	35	23.16	34.83958	-76.33607	A	8	*
5	15	Ertolacci	SCB	3	23.41	34.83513	-76.33882	A	8	*
5	15	Ertolacci	SCB	31	23.96	34.82891	-76.34499	A	8	*
5	15	Ertolacci	SCB	12	24.39	34.82381	-76.34942	A	8	*
5	15	Ertolacci	SCB	13	24.71	34.82001	-76.35285	A	8	*
5	15	Ertolacci	SCB	24	25.72	34.80876	-76.36415	A	8	*
5	15	Ertolacci	SCB	1	26.15	34.80394	-76.36876	A	8	*
5	15	Ertolacci	SCB	2	26.39	34.80122	-76.37157	A	8	*
5	15	Ertolacci	SCB	29	26.53	34.79985	-76.37336	A	8	*
5	15	Ertolacci	SCB	35	26.72	34.79846	-76.375	A	8	*
5	15	Ertolacci	SCB	2	26.84	34.79644	-76.37703	A	8	*
5	15	Ertolacci	SCB	6	27.04	34.79427	-76.37928	A	8	*
5	15	Ertolacci	SCB	15	27.61	34.78785	-76.38551	A	8	*
5	15	Ertolacci	SCB	4	28.07	34.78253	-76.39044	A	8	*
5	15	Ertolacci	SCB	2	28.44	34.7787	-76.3942	A	8	*
5	15	Ertolacci	SCB	9	28.59	34.77671	-76.3962	A	8	*
5	15	Ertolacci	SCB	8	30.95	34.74912	-76.4205	A	8	*
5	15	Ertolacci	SCB	5	31.12	34.74699	-76.42234	A	8	*
5	15	Ertolacci	SCB	1	31.92	34.73775	-76.43077	A	8	*
5	15	Ertolacci	SCB	8	32.05	34.7362	-76.43224	A	8	*
5	15	Ertolacci	SCB	13	32.14	34.73525	-76.4332	A	8	*
5	15	Ertolacci	SCB	5	32.28	34.73365	-76.43473	A	8	*
5	15	Ertolacci	SCB	5	32.42	34.732	-76.4362	A	8	*
5	15	Ertolacci	SCB	6	32.63	34.72958	-76.43838	A	8	*
5	15	Ertolacci	SCB	11	33.1	34.7241	-76.44331	A	8	*
5	15	Ertolacci	SCB	4	33.39	34.72052	-76.44611	A	8	*
5	15	Ertolacci	SCB	3	33.94	34.71397	-76.45156	A	8	*
5	15	Ertolacci	SCB	3	34.44	34.70814	-76.45687	A	8	*
5	15	Ertolacci	SCB	3	34.91	34.70253	-76.46157	A	8	*
5	15	Ertolacci	SCB	8	35.05	34.70102	-76.46307	A	8	*
5	15	Ertolacci	SCB	1	35.95	34.69026	-76.47228	B	8	*
5	15	Ertolacci	SCB	10	36.41	34.68487	-76.4769	A	8	*
5	15	Ertolacci	SCB	16	37.09	34.67649	-76.48335	A	8	*
5	15	Ertolacci	SCB	6	38.25	34.66272	-76.49487	A	6	*
5	15	Ertolacci	SCB	4	39.11	34.65183	-76.50225	B	6	*
5	15	Ertolacci	SCB	13	39.46	34.64725	-76.50496	A	6	*
5	15	Ertolacci	SCB	3	40.01	34.63988	-76.50864	A	6	*
5	15	Ertolacci	SCB	5	40.55	34.63305	-76.51322	A	6	*
5	15	Ertolacci	SCB	4	40.8	34.62974	-76.51516	A	6	*
5	15	Ertolacci	SCB	28	42.96	34.60156	-76.53148	A	6	*

5	15	Ertolacci	SCB	5	43.05	34.60022	-76.53186	A	6	*
5	15	Ertolacci	SCB	4	43.41	34.5951	-76.53349	A	6	*
5	15	Ertolacci	SCB	1	43.73	34.59061	-76.53481	A	6	*
5	15	Ertolacci	SCB	7	44.06	34.5862	-76.53561	A	6	*
5	25	Bernau	NCB	2	16.02	34.90748	-76.24309		8	*
5	25	Bernau	NCB	31	3.74	35.03034	-76.08648		6	*
5	25	Bernau	NCB	35	3.65	35.03117	-76.08534		6	*
5	25	Bernau	NCB	13	3.26	35.03488	-76.08001		6	*
5	25	Bernau	NCB	13	3.14	35.03819	-76.07455		6	*
5	25	Bernau	NCB	61	2.4	35.04194	-76.06775		6	*
5	25	Bernau	NCB	62	2.18	35.04544	-76.05938		6	*
5	25	Bernau	NCB	30	1.33	35.04842	-76.05107		6	*
5	25	Bernau	NCB	27	0.83	35.0594	-76.04416		6	*
5	25	Ertolacci	SCB	1	46.01	34.61268	-76.55209	A		*
5	25	Ertolacci	SCB	13	43.74	34.59042	-76.53472	C		*
5	25	Ertolacci	SCB	3	42.57	34.60682	-76.5293	A		*
5	25	Ertolacci	SCB	24	39.45	34.6474	-76.50487	A		*
5	25	Ertolacci	SCB	5	38.44	34.66031	-76.49663	A		*
5	25	Ertolacci	SCB	8	38.02	34.66549	-76.4927	A		*
5	25	Ertolacci	SCB	6	37.43	34.67243	-76.48668	B		*
5	25	Ertolacci	SCB	6	37.25	34.67459	-76.48493	A		*
5	25	Ertolacci	SCB	2	37.17	34.67559	-76.484	B		*
5	25	Ertolacci	SCB	7	37.06	34.67697	-76.48296	A		*
5	25	Ertolacci	SCB	6	36.9	34.67892	-76.48151	A		*
5	25	Ertolacci	SCB	5	36.85	34.67948	-76.48102	A		*
5	25	Ertolacci	SCB	5	35.36	34.69725	-76.46623	A		*
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5	25	Ertolacci	SCB	4	34.97	34.70189	-76.46219	A		*
5	25	Ertolacci	SCB	9	34.59	34.70633	-76.4584	A		*
5	25	Ertolacci	SCB	7	34.2	34.71094	-76.45426	A		*
5	25	Ertolacci	SCB	7	33.67	34.71718	-76.449	A		*
5	25	Ertolacci	SCB	5	33.6	34.71755	-76.44869	A		*
5	25	Ertolacci	SCB	3	33.38	34.72057	-76.44601	B		*
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5	25	Ertolacci	SCB	2	29.4	34.76692	-76.40421	A		*
5	25	Ertolacci	SCB	11	28.16	34.78155	-76.39142	A		*
5	25	Ertolacci	SCB	15	28.1	34.7845	-76.38864	A		*
5	25	Ertolacci	SCB	8	27.47	34.78937	-76.38385	B		*
5	25	Ertolacci	SCB	3	26.85	34.79625	-76.37684	A		*
5	25	Ertolacci	SCB	12	26.46	34.80044	-76.37221	A		*
5	25	Ertolacci	SCB	10	26.05	34.80489	-76.36765	A		*
5	25	Ertolacci	SCB	43	25.92	34.80636	-76.36617	A		*
5	25	Ertolacci	SCB	7	25.49	34.81123	-76.36135	A		*

5	25	Ertolacci	SCB	10	25.34	34.81285	-76.3596	A		*
5	25	Ertolacci	SCB	40	24.91	34.81771	-76.35477	A		*
5	25	Ertolacci	SCB	13	24.5	34.82222	-76.35032	C		*
5	25	Ertolacci	SCB	14	24.18	34.82617	-76.347	B		*
5	25	Ertolacci	SCB	15	24.1	34.82703	-76.34623	A		*
5	25	Ertolacci	SCB	9	23.98	34.82844	-76.34502	B		*
5	25	Ertolacci	SCB	22	23.47	34.83436	-76.33947	A		*
5	25	Ertolacci	SCB	10	23.32	34.83601	-76.33759	A		*
5	25	Ertolacci	SCB	5	23.12	34.83991	-76.33533	A		*
6	5	Loges	SCB	7	23.16	34.83792	-76.33582	B	2	*
6	5	Loges	SCB	4	23.96	34.82879	-76.34478	B	2	*
6	5	Loges	SCB	5	24.86	34.81824	-76.35425	B	2	*
6	5	Loges	SCB	1	25.24	34.81402	-76.35853	B	2	*
6	5	Loges	SCB	25	25.56	34.81044	-76.36225	B	2	*
6	5	Loges	SCB	2	26.51	34.801	-76.37176	B	2	*
6	5	Loges	SCB	8	27.27	34.79177	-76.38185	B	2	*
6	5	Loges	SCB	10	27.79	34.78578	-76.38744	B	2	*
6	5	Loges	SCB	5	30.31	34.75639	-76.41359	B	2	*
6	5	Loges	SCB	12	30.45	34.75509	-76.41497	B	2	*
6	5	Loges	SCB	2	31.84	34.73859	-76.42991	B	2	*
6	5	Loges	SCB	2	34.44	34.70811	-76.45683	B	2	*
6	5	Loges	SCB	15	36.54	34.68317	-76.47788	B	3	*
6	5	Loges	SCB	4	38.48	34.65989	-76.49676	B	3	*
6	5	Loges	SCB	14	39.52	34.64645	-76.50527	B	3	*
6	5	Loges	SCB	7	40.5	34.63357	-76.51273	B	3	*
6	5	Altman	NCB	14	6.89	34.9996	-76.12753	A	4	*
6	5	Altman	NCB	3	4.59	35.02217	-76.09758	A	4	*
6	5	Altman	NCB	33	3.32	35.03426	-76.0807	A	4	*
6	5	Altman	NCB	11	2.11	35.04454	-76.06208	A	4	*
6	5	Altman	NCB	20	1.2	35.04959	-76.04777	A	4	*
7	15	Altman	NCB	20	1.53	35.04704	-76.05375	A	5	*
7	15	Altman	NCB	3	0.34	35.05645	-76.03605	A	5	*
7	15	Ertolacci	SCB	0						
7	25	Ertolacci	SCB	0						
7	25	Bernau	NCB	12	3.75	35.03032	-76.08667	B	3	*
7	25	Bernau	NCB	9	3.16	35.03582	-76.07854	B	3	*
8	4	Ertolacci	SCB	11	23.29	34.83634	-76.33734	B	5	*
8	4	Ertolacci	SCB	45	38.09	34.6647	-76.49324	B	5	**
8	4	Ertolacci	SCB	8	34.25	34.71037	-76.45486	B	5	*
8	5	Altman	NCB	4	8.04	34.98831	-76.14241	A	4	*
8	5	Altman	NCB	9	4.29	35.02511	-76.0937	A	4	*
8	5	Altman	NCB	3	1.2	35.04957	-76.0475	A	4	*
8	5	Altman	NCB	21	0.39	35.05501	-76.03637	A	4	*
8	5	Altman	NCB	7	0.08	35.06204	-76.03555	A	4	*
8	15	Altman	NCB	19	18	34.88156	-76.28019	A	3	*
8	15	Altman	NCB	10	3.29	35.03451	-76.08026	A	3	*
8	15	Altman	NCB	7	2.67	35.03977	-76.07158	A	3	*
8	15	Altman	NCB	11	1.17	35.04985	-76.04678	A	3	*

8	15	Altman	NCB	9	0.53	35.05542	-76.0361	A	3	*
8	15	Altman	NCB	3	0.12	35.06133	-76.0357	A	3	*
8	15	Ertolacci	SCB	3	34.46	34.70787	-76.45697	B	6	*
8	25	Ertolacci	SCB	0						
8	26	Altman	NCB	1	19	34.87962	-76.28365	A	5	*
8	26	Altman	NCB	8	2.8	34.87962	-76.28365	A	5	*
8	26	Altman	NCB	4	1.88	35.0452	-76.05951	A	5	*
8	26	Altman	NCB	1	1.25	35.4909	-76.04849	A	5	*
8	26	Altman	NCB	2	0.09	35.06186	-76.0356	B	5	*
9	4	Altman	NCB	12	3.17	35.03567	-76.07853	A	8	*
9	4	Altman	NCB	3	1.41	35.0481	-76.05179	A	8	*
9	5	Ertolacci	SCB	0						
9	14	Ertolacci	SCB	0						
9	15	Altman	NCB	2	17.34	34.89464	-76.26026	D	5	*
9	15	Altman	NCB	15	0.6	35.05282	-76.03961	B	5	*
9	26	Bernau	NCB	0					7	*
10	6	Altman	SCB	0					1	*
10	5	Bernau	NCB	0					4	*
10	14	Altman	NCB	0					7	*
10	15	Altman	SCB	0					7	*
10	23	Altman	SCB	0					8	*
10	24	Altman	NCB	9	19	34.87949	-76.2817	A	6	*
10	24	Altman	NCB	10	16	34.90268	-76.24984	A	6	*
10	24	Altman	NCB	4	14	34.92303	-76.22446	A	6	*
10	24	Altman	NCB	11	13	34.93891	-76.20568	A	6	*
10	24	Altman	NCB	13		34.95324	-76.18814	B	6	*
10	24	Altman	NCB	6	10	34.96103	-76.17824	B	8	*
10	24	Altman	NCB	8	9	34.97679	-76.15696	B	8	*
10	24	Altman	NCB	3		34.99004	-76.13999	B	8	*
10	24	Altman	NCB	6		35.00502	-76.12035	B	8	*
10	24	Altman	NCB	3		35.02519	-76.09404	B	8	*
10	24	Altman	NCB	20	4	35.03522	-76.07956	B	8	*
10	24	Altman	NCB	3	2	35.0447	-76.06155	B	8	*
10	24	Altman	NCB	27	2	35.04554	-76.05961	B	8	*
10	24	Altman	NCB	12	1	35.05388	-76.03858	B	8	*