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

2009 SUMMARY REPORT

USFWS Photo

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 rufa*) 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 2009 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 (NCB) and South Core Banks (SCB) beginning in mid-March.

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 5th and from July 15th to October 25th.

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 136 birds. South Core Banks averaged 123 birds and Shackleford Banks only had one count of 18 birds on 16-December. SCB had the two highest counts of 710 birds on May 15 and 543 birds on May 25. The peak numbers were during spring migrations with 1224 birds counted on the May 15 census and 1068 birds on May 25. The spring migration from 15 March to 5 June averaged 449 birds. There was also a small peak in August when fall migrants moved back through (Figure 1). The fall migration from 15 July to 25 October averaged 95 birds. A winter count on December

15th yielded 340 birds on NCB. There were 20 banded and flagged birds. Red knots were distributed over the length of the seashore (Figure2).

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 14 birds/kilometer compared to 34 birds/kilometer in 1992-1993. This comparison does take into account the gain of 2 km of census data due to New Drum Inlet closing in 2009. The 1992-1993 study censused 34 km, were as North Core Banks length was 36 km in 2009 after the closing of Old Drum Inlet and New Drum Inlet in March. While NCB averaged more birds overall, SCB had the two highest peak counts. 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, 1992-2009.

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
2009	25-May	525	36	14

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. Number of Red Knots Counted at Cape Lookout National Seashore in 2009.

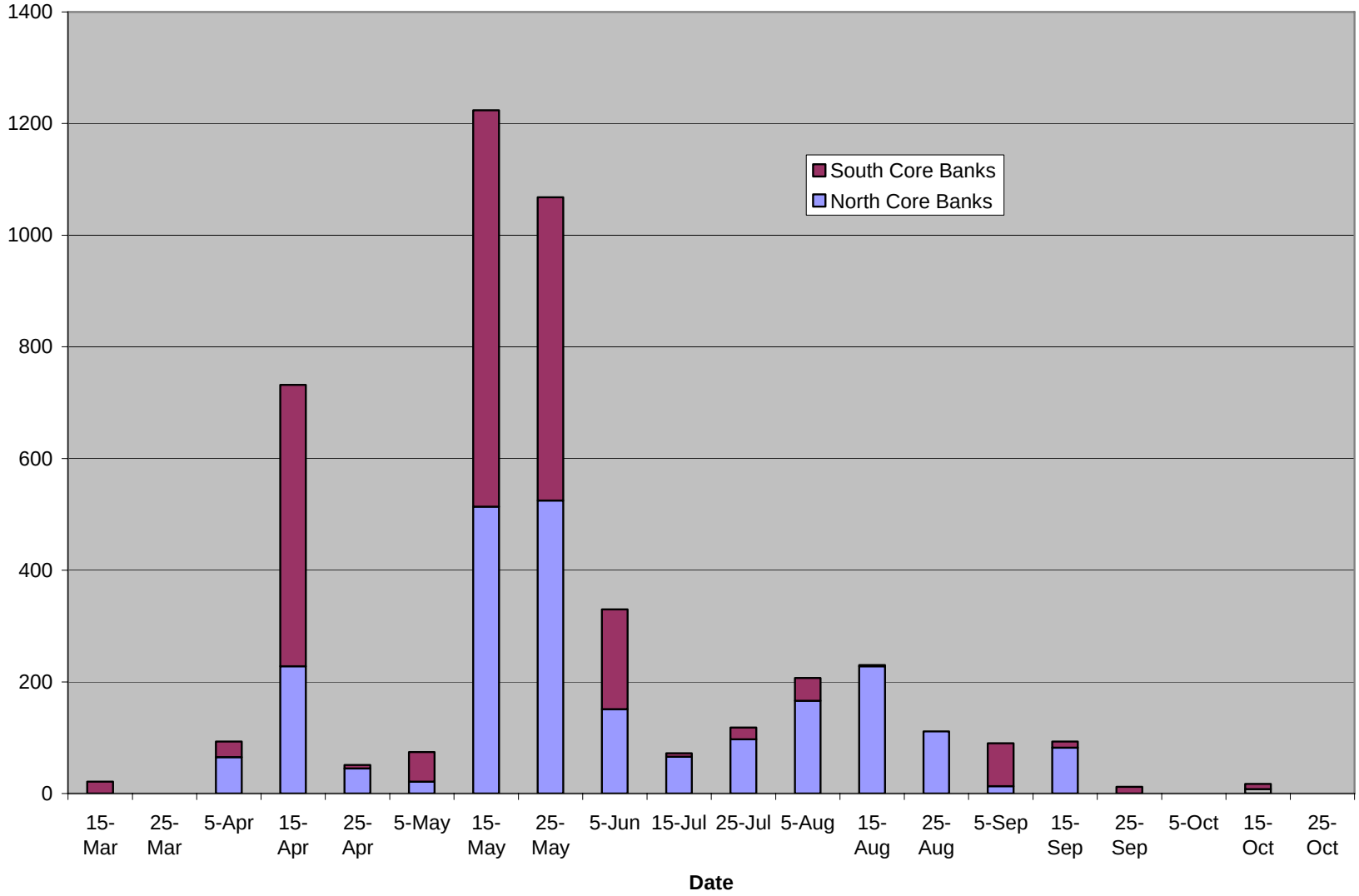
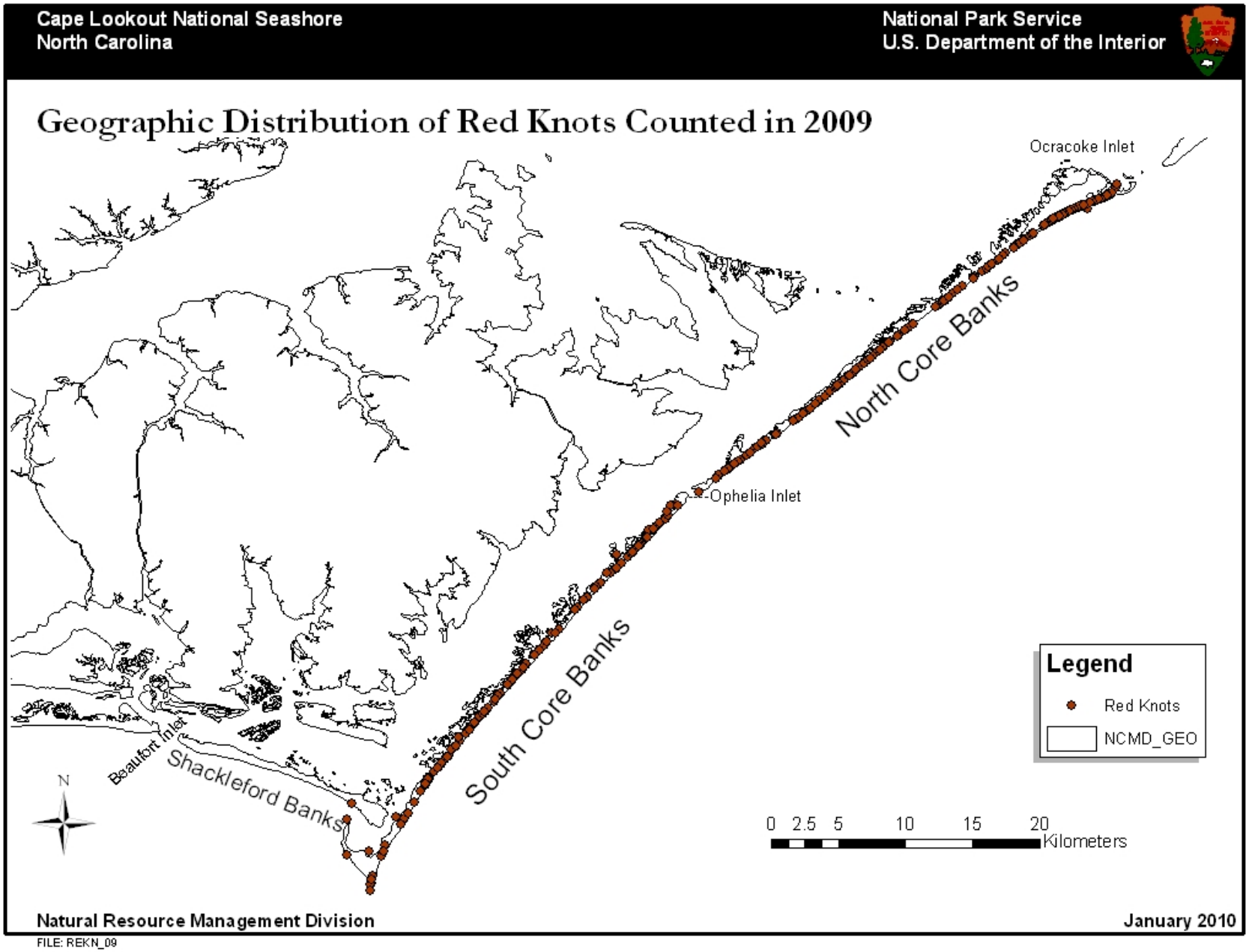


Figure 2. Geographic Distribution of Red Knots Counted in 2009.



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. 2009 Red Knot Survey Data

Month	Day	Observer	Island	REKN	Mile	Latitude	Longitude	Disturbance	Tide	Accuracy
3	16	J. Altman	NCB	0					1	*
3	16	Jon Altman	NCB	0					1	*
3	18	Altman J	SCB	21	25.5			B	8	*
4	7	S. Ramsey	NCB	5		34.88843	-76.26915	A		*
4	7	S. Ramsey	NCB	50	5.42	35.01412	-76.10864	B		**
4	7	S. Ramsey	NCB	10	3.13	35.03597	-76.07782	B		*
4	15	P. Dailey	NCB	8	20.1	34.86821	-76.29721	A	4	*
4	15	P. Dailey	NCB	46	19.8	34.87102	-76.29341	A	4	*
4	15	P. Dailey	NCB	12	14.2	34.92666	-76.22008	A	4	*
4	15	P. Dailey	NCB	1	13.5	34.93324	-76.21259	A	2	*
4	15	P. Dailey	NCB	1	12.7	34.94201	-76.20197	A	2	*
4	15	P. Dailey	NCB	38	11.7	34.95199	-76.18978	A	2	*
4	15	P. Dailey	NCB	65	10.3	34.96642	-76.17144	A	2	*
4	15	P. Dailey	NCB	3	4	35.02769	-76.09029	A	2	*
4	15	P. Dailey	NCB	7	3.45	35.03311	-76.08248	A	2	*
4	15	P. Dailey	NCB	43	2.37	35.04214	-76.06702	A	2	*
4	15	P. Dailey	NCB	4	0.2	35.05958	-76.03382	A	2	*
4	25	T.Simmons	NCB	1	21	34.84572	-76.33046	A	6	*
4	25	T.Simmons	NCB	9	20.1	34.86871	-76.29637	A	6	*
4	25	T.Simmons	NCB	4	18.5	34.88357	-76.27633	A	6	*
4	25	T.Simmons	NCB	5	13.1	34.93776	-76.20677	A	6	*
4	25	T.Simmons	NCB	7	12.5	34.94222	-76.20153	A	6	*
4	25	T.Simmons	NCB	19	5.1	35.05137	-76.04398	A	6	*
4	7	Altman K	SCB	21	30.3	34.75959	-76.4132	B	3	*
4	7	Altman K	SCB	4	40.5	34.63393	-76.5126	B	3	*
4	7	Altman K	SCB	2	42.3	34.61005	-76.5275	B	3	*
4	7	Altman K	SCB	1	43.6	34.59195	-76.53434	B	3	*
4	15	Altman K	SCB	9	23.3	34.83609	-76.3371	A	5	*
4	15	Altman K	SCB	3	24.4	34.82391	-76.34946	A	5	*
4	15	Altman K	SCB	57	24.8	34.81948	-76.35334	A	5	*
4	15	Altman K	SCB	99	25.4	34.81254	-76.36034	A	5	*
4	15	Altman K	SCB	2	25.6	34.81011	-76.36256	A	5	*
4	15	Altman K	SCB	110	26.3	34.80218	-76.37081	A	5	*
4	15	Altman K	SCB	3	27.9	34.78418	-76.3892	A	5	*
4	15	Altman K	SCB	82	37.1	34.67595	-76.48399	A	5	*
4	15	Altman K	SCB	13	37.5	34.67164	-76.48759	A	5	*
4	15	Altman K	SCB	18	37.9	34.66637	-76.49179	A	5	*
4	15	Altman K	SCB	73	40.5	34.63308	76.51323	B	5	*
4	15	Altman K	SCB	17	41.1	34.63609	-76.51732	B	5	*
4	15	Altman K	SCB	18	43.3	34.59612	-76.5332	B	5	*
4	25	Fetter	SCB	4	36.7	34.68274	-76.47804	B	6	*
4	25	Fetter	SCB	2	37.2	34.67499	-76.48472	C	6	*
5	5	S. Ramsey	NCB	5	1.8	35.04585	-76.05834	A	6	*

5	5	S. Ramsey	NCB	8	14.2	34.92646	-76.22034	B	4	*
5	5	S. Ramsey	NCB	2	16.5	34.9029	-76.24927	A	4	*
5	5	S. Ramsey	NCB	6	18.5	34.88355	-76.27635	A	4	*
5	15	P. Dailey	NCB	9	19.9	34.87051	-76.29406	A	2	*
5	15	P. Dailey	NCB	38	19.8	34.87146	-76.29282	A	2	*
5	15	P. Dailey	NCB	2	19.7	34.87297	-76.29049	A	2	*
5	15	P. Dailey	NCB	4	19.6	34.87438	-76.2885	A	2	*
5	15	P. Dailey	NCB	6	19.5	34.87573	-76.28655	A	2	*
5	15	P. Dailey	NCB	2		34.89258	-76.26341	A	2	*
5	15	P. Dailey	NCB	3	15.8	34.90806	-76.24237	A	2	*
5	15	P. Dailey	NCB	29	15.3	34.91482	-76.23416	A	2	*
5	15	P. Dailey	NCB	21	14.9	34.92004	-76.22804	B	2	*
5	15	P. Dailey	NCB	2	14	34.92861	-76.21784	A	2	*
5	15	P. Dailey	NCB	8	13.8	34.92994	-76.21637	A	2	*
5	15	P. Dailey	NCB	4	13.8	34.93228	-76.21387	A	2	*
5	15	P. Dailey	NCB	20	12.8	34.94092	-76.20333	A	2	*
5	15	P. Dailey	NCB	7	12.3	34.94542	-76.19792	A	2	*
5	15	P. Dailey	NCB	11	12.1	34.94795	-76.19476	A	2	*
5	15	P. Dailey	NCB	4	12	34.94949	-76.19279	A	2	*
5	15	P. Dailey	NCB	23	11.8	34.9513	-76.19069	A	2	*
5	15	P. Dailey	NCB	3	10.9	34.95931	-76.18069	A	2	*
5	15	P. Dailey	NCB	8	10.5	34.96449	-76.17397	A	2	*
5	15	P. Dailey	NCB	15	8.48	34.98261	-76.14936	A	2	*
5	15	P. Dailey	NCB	10	8.46	34.98399	-76.14777	A	2	*
5	15	P. Dailey	NCB	7	8.17	34.98701	-76.14414	A	2	*
5	15	P. Dailey	NCB	4	7.12	34.99854	-76.12923	A	2	*
5	15	P. Dailey	NCB	2	6.18	35.00653	-76.11828	A	2	*
5	15	P. Dailey	NCB	32	4.71	35.02097	-76.09931	A	2	*
5	15	P. Dailey	NCB	11	4.48	35.02318	-76.09624	A	2	*
5	15	P. Dailey	NCB	7	4.21	35.02767	-76.08995	A	2	*
5	15	P. Dailey	NCB	23	2.33	35.04244	-76.06637	A	2	*
5	15	P. Dailey	NCB	33	2.22	35.04328	-76.06456	A	2	*
5	15	P. Dailey	NCB	71	1.75	35.04619	-76.05758	A	2	*
5	15	P. Dailey	NCB	65	1.7	35.04663	-76.05678	A	2	*
5	15	P. Dailey	NCB	4	1.43	35.04008	-76.05220	A	2	*
5	15	P. Dailey	NCB	13	0.77	35.05170	-76.04290	A	2	*
5	15	P. Dailey	NCB	11	0.2	35.05844	-76.03492	A	2	*
5	15	P. Dailey	NCB	2	0.13	35.06069	-76.03410	A	2	*
5	25	T.Simmons	NCB	15	22			B	3	*
5	25	T.Simmons	NCB	6	20.4	34.8646	-76.30157	B	3	*
5	25	T.Simmons	NCB	34	19.9	34.86921	-76.29553	B	3	*
5	25	T.Simmons	NCB	20	19.4	34.87474	-76.28781	B	3	*
5	25	T.Simmons	NCB	11	19	34.87834	-76.28272	B	3	*
5	25	T.Simmons	NCB	3	18.3	34.88476	-76.27461	B	3	*
5	25	T.Simmons	NCB	15	16.5	34.90234	-76.25009	B	3	*
5	25	T.Simmons	NCB	3	16.3	34.90464	-76.24691	B	3	*
5	25	T.Simmons	NCB	16	15.2	34.91538	-76.23341	B	3	*
5	25	T.Simmons	NCB	3	14.9	34.91861	-76.22956	B	3	*

5	25	T.Simmons	NCB	4	14.6	34.92174	-76.22608	B	3	*
5	25	T.Simmons	NCB	4	14.3	34.92433	-76.22284	B	3	*
5	25	T.Simmons	NCB	8	14	34.92812	-76.21838	B	3	*
5	25	T.Simmons	NCB	3	13.8	34.92952	-76.21667	B	3	*
5	25	T.Simmons	NCB	10	13.7	34.93149	-76.21454	B	3	*
5	25	T.Simmons	NCB	16	13.4	34.93428	-76.21111	B	3	*
5	25	T.Simmons	NCB	4	13.2	34.936	-76.20896	B	3	*
5	25	T.Simmons	NCB	3	12.7	34.94083	-76.20314	A	3	*
5	25	T.Simmons	NCB	4	12.6	34.94257	-76.2012	A	3	*
5	25	T.Simmons	NCB	13	11.9	34.94958	-76.19237	A	3	*
5	25	T.Simmons	NCB	11	11.5	34.95407	-76.18702	A	3	*
5	25	T.Simmons	NCB	1	11.4	34.95502	-76.18576	A	3	*
5	25	T.Simmons	NCB	16	11	34.95844	-76.1814	A	3	*
5	25	T.Simmons	NCB	11	10.6	34.96274	-76.17599	A	3	*
5	25	T.Simmons	NCB	7	10.2	34.96679	-76.17059	A	3	*
5	25	T.Simmons	NCB	29	8.91	34.97914	-76.15396	A	3	*
5	25	T.Simmons	NCB	6	8.83	34.97994	-76.15285	A	3	*
5	25	T.Simmons	NCB	4	8.68	34.98143	-76.15092	A	3	*
5	25	T.Simmons	NCB	7	7.62	34.99205	-76.1375	A	3	*
5	25	T.Simmons	NCB	8	7.04	34.99769	-76.12987	A	3	*
5	25	T.Simmons	NCB	7	6.91			A	4	*
5	25	T.Simmons	NCB	3	6.6	35.00208	-76.12415	A	4	*
5	25	T.Simmons	NCB	4	6.39	35.00413	-76.12138	A	4	*
5	25	T.Simmons	NCB	8	6.27	35.00529	-76.11985	A	4	*
5	25	T.Simmons	NCB	7	6.07	35.00729	-76.11736	A	4	*
5	25	T.Simmons	NCB	5	5.52	35.01275	-76.11009	A	4	*
5	25	T.Simmons	NCB	9	4.85	35.01919	-76.10136	A	4	*
5	25	T.Simmons	NCB	2	4.78	35.01997	-76.10050	A	4	*
5	25	T.Simmons	NCB	11	4.15	35.02607	-76.09209	A	4	*
5	25	T.Simmons	NCB	3	2.91	35.03756	-76.07517	A	4	*
5	25	T.Simmons	NCB	1	2.73	35.03893	-76.07246	A	4	*
5	25	T.Simmons	NCB	10	2.2	35.04297	-76.06439	A	4	*
5	25	T.Simmons	NCB	12	2.14	35.04339	-76.0636	A	4	*
5	25	T.Simmons	NCB	25	2.07	35.04391	-76.06244	A	4	*
5	25	T.Simmons	NCB	35	1.93	35.04475	-76.06021	A	4	*
5	25	T.Simmons	NCB	23	1.89	35.04498	-76.05960	A	4	*
5	25	T.Simmons	NCB	6	1.68	35.04642	-76.05627	A	4	*
5	25	T.Simmons	NCB	3	1.61	35.04688	-76.05511	A	4	*
5	25	T.Simmons	NCB	14	1.29	35.04891	-76.04944	A	4	*
5	25	T.Simmons	NCB	17	1.22	35.04937	-76.04825	A	4	*
5	25	T.Simmons	NCB	9	1.27	35.05184	-76.04197	A	4	*
5	25	T.Simmons	NCB	16	0.49	35.05375	-76.03791	A	4	*
5	5	Fetter	SCB	2	38.6	34.65896	-76.49754	B	4	*
5	5	Fetter	SCB	15	37.6	34.66972	-76.48901	B	4	*
5	5	Fetter	SCB	6	36.3			B	4	*
5	5	Fetter	SCB	21	34.5	34.70727	-76.45769	B	4	*
5	5	Fetter	SCB	2	30.8	34.75126	-76.41819	B	4	*
5	5	Fetter	SCB	7	24	34.82846	-76.3453	B	4	*

5	15	Altman K	SCB	58	23.2	34.83689	-76.33642	B		*
5	15	Altman K	SCB	5	25.9	34.80641	-76.36626	B		*
5	15	Altman K	SCB	33	27.3	34.79172	-76.38177	B		*
5	15	Altman K	SCB	85	28	34.78369	-76.3895	B		*
5	15	Altman K	SCB	44	28.6	34.7769	-76.39602	B		*
5	15	Altman K	SCB	14	29.8	34.76186	-76.4086	B		*
5	15	Altman K	SCB	94	30.6	34.75326	-76.41653	B		*
5	15	Altman K	SCB	13	31.9	34.73836	-76.43022	B		*
5	15	Altman K	SCB	37	32.2	34.73502	-76.43334	B		*
5	15	Altman K	SCB	54	33.5	34.71889	-76.44758	B		*
5	15	Altman K	SCB	40	34.5	34.70697	-76.45791	B		*
5	15	Altman K	SCB	128	35.7	34.69369	-76.46961	B		*
5	15	Altman K	SCB	17	37.4	34.67304	-76.48635	B		*
5	15	Altman K	SCB	28	39.3	34.6992	-76.50312	B		*
5	15	Altman K	SCB	8	43.7	34.59112	-76.53495	B		*
5	15	Altman K	SCB	48	45.8	34.61046	-76.55061	B		*
5	15	Altman K	SCB	4	47.5	34.63446	-76.55028	B		*
5	25	Fetter	SCB	4	24	34.82875	-76.34511	B		*
5	25	Fetter	SCB	2	24.3	34.82875	-76.34825	B		*
5	25	Fetter	SCB	3	24.8	34.81892	-76.35398	B		*
5	25	Fetter	SCB	15	24.9	34.81788	-76.35494	B		*
5	25	Fetter	SCB	1	25.2	34.81493	-76.35789	B		*
5	25	Fetter	SCB	4	25.3	34.81327	-76.35955	B		*
5	25	Fetter	SCB	15	26.2	34.80257	-76.37047	B		*
5	25	Fetter	SCB	19	26.6	34.79968	-76.37379	B		*
5	25	Fetter	SCB	3	26.7	34.79973	-76.37575	B		*
5	25	Fetter	SCB	41	27.2	34.79318	-76.3806	B		*
5	25	Fetter	SCB	2	27.3	34.7905	-76.38317	B		*
5	25	Fetter	SCB	30	27.5	34.78945	-76.38424	B		*
5	25	Fetter	SCB	6	27.5	34.78135	-76.39218	B		*
5	25	Fetter	SCB	11	30.1	34.75937	-76.41093	B		*
5	25	Fetter	SCB	18	31	34.74812	-76.42143	B		*
5	25	Fetter	SCB	9	31.3	34.74448	-76.42484	B		*
5	25	Fetter	SCB	11	31.9	34.73847	-76.4303	B		*
5	25	Fetter	SCB	34	32	34.7364	-76.43215	B		*
5	25	Fetter	SCB	22	32.6	34.7305	-76.43753	B		*
5	25	Fetter	SCB	1	32.8	34.72795	-76.43987	B		*
5	25	Fetter	SCB	10	33	34.72488	-76.44258	B		*
5	25	Fetter	SCB	62	33.7	34.71721	-76.44918	B		*
5	25	Fetter	SCB	4	34	34.71327	-76.45209	B		*
5	25	Fetter	SCB	8	34.4	34.70901	-76.45593	B		*
5	25	Fetter	SCB	37	34.7	34.70507	-76.45982	B		*
5	25	Fetter	SCB	55	34.9	34.70328	-76.46139	B		*
5	25	Fetter	SCB	7	35.3	34.69815	-76.46559	B		*
5	25	Fetter	SCB	2	35.6	34.69403	-76.46903	B		*
5	25	Fetter	SCB	5	35.8	34.69162	-76.471	B		*
5	25	Fetter	SCB	2	36.3	34.68667	-76.47517	B		*
5	25	Fetter	SCB	12	36.8	34.68106	-76.48031	B		*

5	25	Fetter	SCB	3	37.2	34.67502	-76.48454	B		*
5	25	Fetter	SCB	19	37.4	34.67184	-76.48721	B		*
5	25	Fetter	SCB	8	37.8	34.6686	-76.49001	B		*
5	25	Fetter	SCB	2	38.4	34.66137	-76.49557	B		*
5	25	Fetter	SCB	5	38.5	34.65927	-76.4969	B		*
5	25	Fetter	SCB	4	38.7	34.65735	-76.49824	B		*
5	25	Fetter	SCB	22	39	34.65337	-76.50118	B		*
5	25	Fetter	SCB	1	39.5	34.64554	-76.50533	B		*
5	25	Fetter	SCB	4	40.4	34.63497	-76.51163	B		*
5	25	Fetter	SCB	9	41.8	34.61672	-76.52475	B		*
5	25	Fetter	SCB	11	43.5	34.59401	-76.53383	B	4	*
6	5	P. Dailey	NCB	14	20	34.86944	-76.29506	A	2	*
6	5	P. Dailey	NCB	7	18.8	34.8806	-76.27964	A	2	*
6	5	P. Dailey	NCB	1	18.2	34.88652	-76.27179	A	2	*
6	5	P. Dailey	NCB	10	15.8	34.90869	-76.24165	A	2	*
6	5	P. Dailey	NCB	1	14.4	34.92461	-76.22223	A	2	*
6	5	P. Dailey	NCB	3	13.9	34.92969	-76.21632	A	2	*
6	5	P. Dailey	NCB	9	12.4	34.9453	-76.19769	A	2	*
6	5	P. Dailey	NCB	10	12	34.94921	-76.19278	A	2	*
6	5	P. Dailey	NCB	2	9.05	34.97813	-76.15527	A	2	*
6	5	P. Dailey	NCB	5	7.12	34.99729	-76.13035	A	3	*
6	5	P. Dailey	NCB	5	4.67	35.02125	-76.09856	A	3	*
6	5	P. Dailey	NCB	1	4.1	35.02676	-76.09097	A	3	*
6	5	P. Dailey	NCB	3	3.25	35.03476	-76.07957	A	3	*
6	5	P. Dailey	NCB	10	3.1	35.03628	-76.07731	A	3	*
6	5	P. Dailey	NCB	8	3.08	35.03717	-76.07562	A	3	*
6	5	P. Dailey	NCB	12	2.78	35.03876	-76.07278	A	3	*
6	5	P. Dailey	NCB	16	2.61	35.04002	-76.07045	A	3	*
6	5	P. Dailey	NCB	15	1.71	35.04609	-76.05668	A	3	*
6	5	P. Dailey	NCB	11	1.3	35.0488	-76.04973	A	3	*
6	5	P. Dailey	NCB	8	0.56	35.0533	-76.03895	A	3	*
6	5	Altman, K	SCB	13	23.8	34.83095	-76.3429	B	4	*
6	5	Altman, K	SCB	15	24.4	34.8239	-76.34934	B	4	*
6	5	Altman, K	SCB	8	25.5	34.81171	-76.3694	B	4	*
6	5	Altman, K	SCB	16	26.2	34.80334	-76.3694	B	4	*
6	5	Altman, K	SCB	8	28.7	34.77498	-76.39773	B	4	*
6	5	Altman, K	SCB	6	32	34.73662	-76.43175	B	4	*
6	5	Altman, K	SCB	9	32.4	34.73222	-76.43589	B	4	*
6	5	Altman, K	SCB	20	33.9	34.71458	-76.45087	B	4	*
6	5	Altman, K	SCB	6	34.7	34.70515	-76.45957	B	4	*
6	5	Altman, K	SCB	42	35.6	34.69434	-76.46866	B	4	*
6	5	Altman, K	SCB	14	37.1	34.67634	-76.48331	B	4	*
6	5	Altman, K	SCB	8	40.1	34.63864	-76.50926	B	4	*
7	15	P. Dailey	NCB	7	15.7	34.91023	-76.23993	B	4	*
7	15	P. Dailey	NCB	4	8.51	34.98309	-76.14877	B	4	*
7	15	P. Dailey	NCB	5	7.89	34.98946	-76.14092	B	4	*
7	15	P. Dailey	NCB	12	5.82	35.00966	-76.11405	B	4	*
7	15	P. Dailey	NCB	6	5.75	35.01038	-76.11303	B	4	*

7	15	P. Dailey	NCB	6	3.07	35.03617	-76.07750	B	4	*
7	15	P. Dailey	NCB	15	2.48	35.04096	-76.06878	B	4	*
7	15	P. Dailey	NCB	7	2.18	35.0431	-76.06425	B	4	*
7	15	P. Dailey	NCB	4	0.58	35.0546	-76.03688	B	4	*
7	25	T.Simmons	NCB	7	20.4	34.86517	-76.30094	B	3	*
7	25	T.Simmons	NCB	5	2.87	35.038	-76.07465	B	3	**
7	25	T.Simmons	NCB	35	2.66	35.03957	-76.07159	B	3	**
7	25	T.Simmons	NCB	40	2.46	35.04125	-76.06863	B	3	**
7	25	T.Simmons	NCB	15	2.01	35.04446	-76.06156	B	3	**
7	15	Altman, K	SCB	6	23.2	34.83837	-76.33587	A	6	*
7	25	Fetter	SCB	10	23.6	34.83323	-76.34064	B	2	*
7	25	Fetter	SCB	11	23.3	34.83618	-76.33673	B	2	*
8	4	T.Simmons	NCB	4	20.1	34.86803	-76.29702	A	8	*
8	4	T.Simmons	NCB	30	16.6	34.90174	-76.25087	A	8	**
8	4	T.Simmons	NCB	20	2.34	35.04212	-76.06683	A	8	**
8	4	T.Simmons	NCB	30	2.15	35.04352	-76.06382	A	8	**
8	4	T.Simmons	NCB	21	2.05	35.04424	-76.06235	A	8	*
8	4	T.Simmons	NCB	8	1.51	35.04761	-76.05352	A	8	*
8	4	T.Simmons	NCB	30	1.42	35.04812	-76.0521	A	8	**
8	4	T.Simmons	NCB	23	1.16	35.04996	-76.04691	A	8	*
8	14	P. Dailey	NCB	4	0.43	35.0546	-76.0369	A	2	*
8	14	P. Dailey	NCB	29	0.73	35.05202	-76.04192	A	2	*
8	14	P. Dailey	NCB	2	0.85	35.05069	-76.04505	A	2	*
8	14	P. Dailey	NCB	5	1.44	35.04805	-76.05233	A	2	*
8	14	P. Dailey	NCB	31	1.73	35.04633	-76.0573	A	2	*
8	14	P. Dailey	NCB	21	1.84	35.04572	-76.05902	A	2	*
8	14	P. Dailey	NCB	3	2.08	35.04398	-76.06284	A	2	*
8	14	P. Dailey	NCB	20	2.22	35.04302	-76.06498	A	2	*
8	14	P. Dailey	NCB	20	2.42	35.04172	-76.06815	A	2	*
8	14	P. Dailey	NCB	13	2.65	35.03968	-76.07140	A	2	*
8	14	P. Dailey	NCB	11	2.76	35.0389	-76.07298	A	2	*
8	14	P. Dailey	NCB	4	3.08	35.03623	-76.07766	A	2	*
8	14	P. Dailey	NCB	21	3.31	35.03468	-76.08086	A	2	*
8	14	P. Dailey	NCB	3	3.49	35.03256	-76.08333	A	2	*
8	14	P. Dailey	NCB	5	3.96	35.02809	-76.08964	A	2	*
8	14	P. Dailey	NCB	27	4.47	35.02306	-76.09636	A	2	*
8	14	P. Dailey	NCB	24	8.56	34.93597	-76.20943	A	2	*
8	14	P. Dailey	NCB	7	13.2	34.93597	-76.20943	A	2	*
8	14	P. Dailey	NCB	6	19.5	34.87335	-76.29027	A	2	*
8	14	P. Dailey	NCB	4	20.5	34.86352	-76.30328	A	2	*
8	14	P. Dailey	NCB	28	22.6	34.84517	-76.33318	A	2	*
8	25	T.Simmons	NCB	5		35.05282	-76.04071	A	8	*
8	25	T.Simmons	NCB	1		35.05103	-76.04477	A	8	*
8	25	T.Simmons	NCB	2		35.0504	-76.04637	A	8	*
8	25	T.Simmons	NCB	14		35.04901	-76.05025	B	8	*
8	25	T.Simmons	NCB	7		35.04845	-76.05187	B	8	*
8	25	T.Simmons	NCB	2		35.04326	-76.0645	B	8	*
8	25	T.Simmons	NCB	9		35.04266	-76.06583	B	8	*

8	25	T.Simmons	NCB	19		35.03662	-76.07711	B	8	*
8	25	T.Simmons	NCB	4		35.03322	-76.08219	B	8	*
8	25	T.Simmons	NCB	13		34.98245	-76.14997	B	8	*
8	25	T.Simmons	NCB	3		35.01841	-76.10265	B	8	*
8	25	T.Simmons	NCB	7		34.9064	-76.24476	B	8	*
8	25	T.Simmons	NCB	25		34.89373	-76.26198	B	8	*
8	5	Altman, K	SCB	15	23.2	34.8377	-76.33596	A	6	*
8	5	Altman, K	SCB	19	23.9	34.83597	-76.33672	A	6	*
8	5	Altman, K	SCB	3	38.6	34.65842	-76.49771	B	6	*
8	5	Altman, K	SCB	4	42.1	34.61278	-76.53606	B	6	*
8	15	Fetter	SCB	2	39	34.66117	-76.49605	B	4	*
8	25	Fetter	SCB	0					2	*
9	5	T.Simmons	NCB	2	22.4	34.84515	-76.32838	B	3	*
9	5	T.Simmons	NCB	2	18.2	34.88664	-76.27225	B	3	*
9	5	T.Simmons	NCB	1	14.2	34.9255	-76.22185	B	3	*
9	5	T.Simmons	NCB	5	13.6	34.93196	-76.21421	B	3	*
9	5	T.Simmons	NCB	3	11.4	34.95445	-76.18673	B	3	*
9	16	P. Dailey	NCB	16	2.48	35.04094	-76.06881	A	6	*
9	16	P. Dailey	NCB	8	2.57	35.04024	-76.07013	A	6	*
9	16	P. Dailey	NCB	16	2.75	35.03884	-76.07288	A	6	*
9	16	P. Dailey	NCB	7	4.67	35.01819	-76.10305	A	6	*
9	16	P. Dailey	NCB	4	7.87	34.98963	-76.14066	A	6	*
9	16	P. Dailey	NCB	24	8.33	34.98492	-76.14656	A	6	*
9	16	P. Dailey	NCB	4	12.4	34.94406	-76.19912	A	4	*
9	16	P. Dailey	NCB	3	13.6	34.93231	-76.21352	A	4	*
9	5	Altman, K	SCB	27	44	34.58696	-76.53521	x	3	*
9	5	Altman, K	SCB	2	42.1	34.61282	-76.52615	x	3	*
9	5	Altman, K	SCB	2	37.7	34.66924	-76.48961	x	3	*
9	5	Altman, K	SCB	1	24.9	34.81775	-76.355	x	3	*
9	5	Altman, K	SCB	16	23.1	34.83861	-76.33531	x	3	*
9	5	Altman, K	SCB	29	23	34.84055	-76.33556	x	3	*
9	15	Fetter	SCB	2	37.2	34.68953	-76.47533	B	8	*
9	15	Fetter	SCB	5	34.6	34.70659	-76.4582	B	8	*
9	15	Fetter	SCB	2	25.5	34.81398	-76.3588	B	8	*
9	15	Fetter	SCB	2	23.9	34.82936	-76.34468	B	8	*
9	25	Altman, K	SCB	3	35.2	34.69896	-76.46504	x	6	*
9	25	Altman, K	SCB	2	36.5	34.6841	-76.47722	B	6	*
9	25	Altman, K	SCB	7	40.7	34.63072	-76.51437	x	6	*
10	8	J. Altman	NCB	0						
10	14	J. Altman	NCB	8	1.7	35.04642	-76.05623	A	8	*
10	6	Altman, J	SCB	0						*
10	15	Altman, J	SCB	9	38.6	34.65838	-76.49802	B	8	*
10	25	Altman, J	SCB	0						*
12	15	J. Altman	NCB	120	3	35.03724	-76.07635	B	7	*
12	15	J. Altman	NCB	107	15.5	34.9135	-76.23626	B	8	*
12	15	J. Altman	NCB	33	17.5	34.89301	-76.26289	A	8	*
12	15	J. Altman	NCB	80	21.5	34.85391	-76.31465	A	8	*
12	16	Altman, J	SB	18	48.5	34.64527	-76.54724	A	1	*