



Town of Kiawah Island
Spring Migration Bird Banding
2011 Report

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EXECUTIVE SUMMARY

The Town of Kiawah Island completed its second spring season of bird banding in 2011. The Captain Sam's Banding Station (CSBS) is located on Captain Sam's spit on the west end of Kiawah Island. The spring banding season operates from 15 March to 31 May. A total of 55 birds of 21 species were banded. Gray Catbirds and Painted Buntings were the most commonly banded migrant species. Resident species were banded in relatively low numbers; however recaptures of residents banded in previous seasons, especially Northern Cardinals, were common. A few uncommon species were banded including a Worm-eating Warbler, Chuck-wills-widow, and Brown-headed Cowbird. Of all birds banded, 73% of them were second-year birds. There were 22 returns recorded during the spring season including four migrants that had been captured or banded the previous spring or earlier. Because after two years of spring banding yielding very little results despite a great deal of effort, the spring migration banding project will be discontinued.

ACKNOWLEDGEMENTS

We would like to express gratitude to the Kiawah Conservancy for supporting our project by providing the funding to purchase mist nets, net poles, and other banding supplies and equipment. Additionally, we thank Kiawah Development Partners for allowing access to their property to band birds. We would like to thank Will Oakley and Jacob Vann for volunteering their time to assist with our banding project. Without the help of dedicated volunteers the project would not be possible.

Front Photo: White-eyed Vireo

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INTRODUCTION

In 2008, the Town of Kiawah Island developed the Kiawah Island Bird Monitoring Program. The program encompasses several projects which highlight Kiawah Island's birdlife. The projects include (1) summer point-counts of breeding songbirds, (2) call-playback surveys of breeding marsh birds, (3) nest monitoring of beach-nesting shorebirds, and (4) bird banding in the spring, winter, and fall. This report will only focus on the bird banding that occurred during the 2011 spring season.

In 2011, the second spring season of a long-term bird banding project was conducted on Kiawah Island. Bird banding on this large of scale has never been performed on Kiawah Island before and it will provide valuable data on the species diversity and composition on Kiawah Island. Bird banding is also a significant tool used to assess the health and demographics of bird population. Important information such as productivity, survivorship, and movements of many species can be attained through a banding program. All banding data collected is submitted to the Bird Banding Laboratory administered by the United States Geological Survey.

The goals of the spring migration bird banding project on Kiawah Island are to:

- Gather baseline information on resident and migratory birds using Kiawah Island.
- Collect data to enable long-term monitoring (i.e. population trends) of birds on Kiawah Island.
- Monitor spring migration to determine the importance of Kiawah Island as stop-over habitat.
- Assess the effects of development on bird populations.
- Provide data to better manage habitat and guide future development plans.
- Contribute high quality data to the North American Bird Banding Program.

STUDY AREA

Banding was conducted at the Captain Sam's Banding Station (CSBS). Captain Sam's Spit is a 45 acre strip of old vegetated dune ridges located at the west end of Kiawah Island. It is bordered by the Atlantic Ocean to the south, the Kiawah River to the west and north, and the mainland of Kiawah Island to the east. Major habitat types include scrub-shrub and high marsh. The overstory is made up of scattered loblolly pine (*Pinus taeda*), eastern red cedar (*Juniperus virginiana*), and red bay (*Persea borbonia*). The dense midstory is dominated by wax myrtle (*Myrica cerifera*), sea ox-eye (*Borrchia frutescens*), marsh elder (*Iva frutescens*), and briars (*Smilax* spp.). The understory is dominated by marshhay cordgrass (*Spartina patens*), sweetgrass (*Muhlenbergia filipes*), sea lavender (*Limonium carolinianum*), and dune sandbur (*Cenchrus tribuloides*). The Captain Sam's Banding Station (CSBS) is centrally located and encompasses about 10 acres (Figure 1).

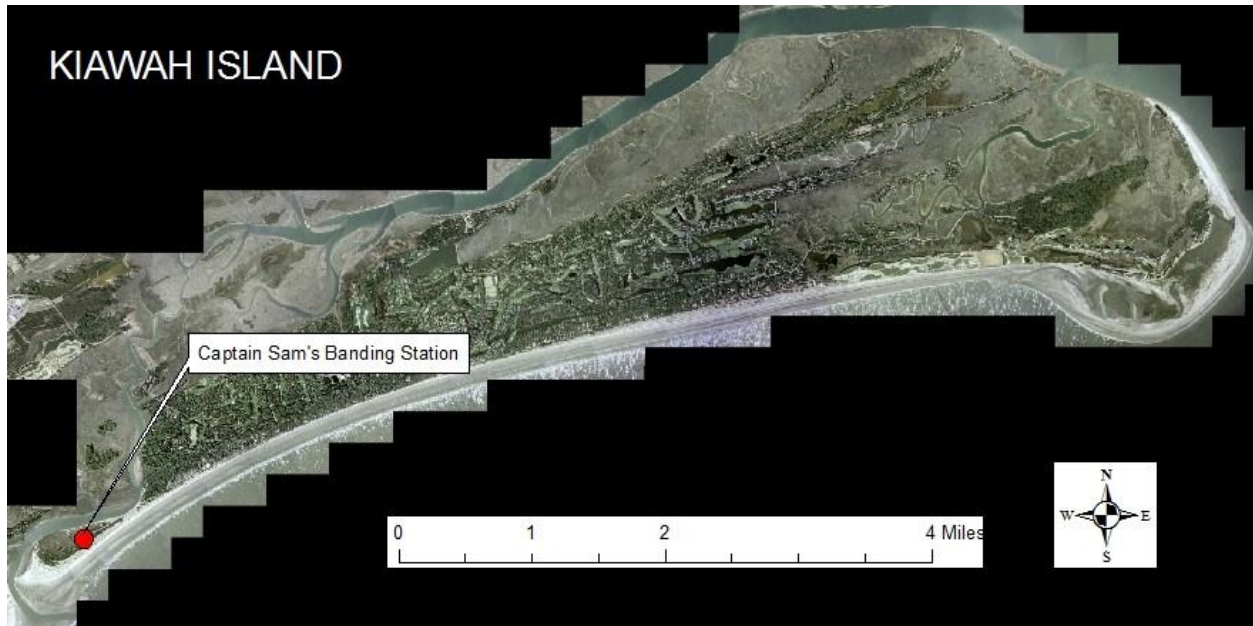


Figure 1. Map of Kiawah Island showing the locations of the Captain Sam's and Cougar Island Banding Stations.

METHODS

Banding was conducted twice per week (weather permitting) from 15 March through 31 May.

Mist nets (30 mm mesh) were used for all trapping. A standard mist net measures 12 meters long by 2.5 meters high and is made from black nylon material. Nets are stretched between two sections of ½ inch metal conduit and anchored in the ground by guy-lines attached to tent stakes. The conduit was painted brown to help conceal the poles. Nets were systematically placed in areas where significant bird activity was likely to occur. The standard setup for most of the season involved 10 nets. Some nets were not opened every session due to lack of personnel and or excessive winds.

Nets were opened 30 minutes before sunrise and closed approximately 5 hours later. On a few occasions, the nets had to be shut down early because of rain, excessive wind, or heat. Nets were checked for birds about every 30 minutes. Captured birds were placed in cloth bags and transported back to the banding table. Birds were fitted with an aluminum leg band and their species, sex, and age were recorded. Morphological measurements including wing chord, fat score, and mass were also recorded. Pictures, if necessary, were taken and the birds were released.

RESULTS AND DISCUSSION

Banding

Banding was conducted on 14 days between 30 March and 26 May. Nets were open for a total of 56.45 hours resulting in 620.8 net-hours (a "net-hour" is a measure of effort and is equal to one standard mist net being operated for one hour). A total of 55 birds of 21 species were banded. Excluding recaptures, a capture rate of 8.6 birds per 100 net-hours was achieved.

Table 1. Comparison of Banding Statistics for the 2010 and 2011 spring seasons.

Banding Statistic	2010	2011
# of banding days	9	14
Net-hours	350.75	620.8
# of birds banded	87	55
# of recaptures	44	52
Capture rate (# new birds/100 net-hours)	24.8	8.6
Capture rate (# recaptures/100 net-hours)	12.5	8.4
Total capture rate	37.3	17.0
# of Species	21	25

The most successful day was 19 April when 10 birds were banded. Not surprisingly, the number of birds banded was low. Songbird migration in spring is generally poor along the south east coast because the prevailing winds push birds away from the coast. The mean over 9 days of banding was 3.9 birds per day.

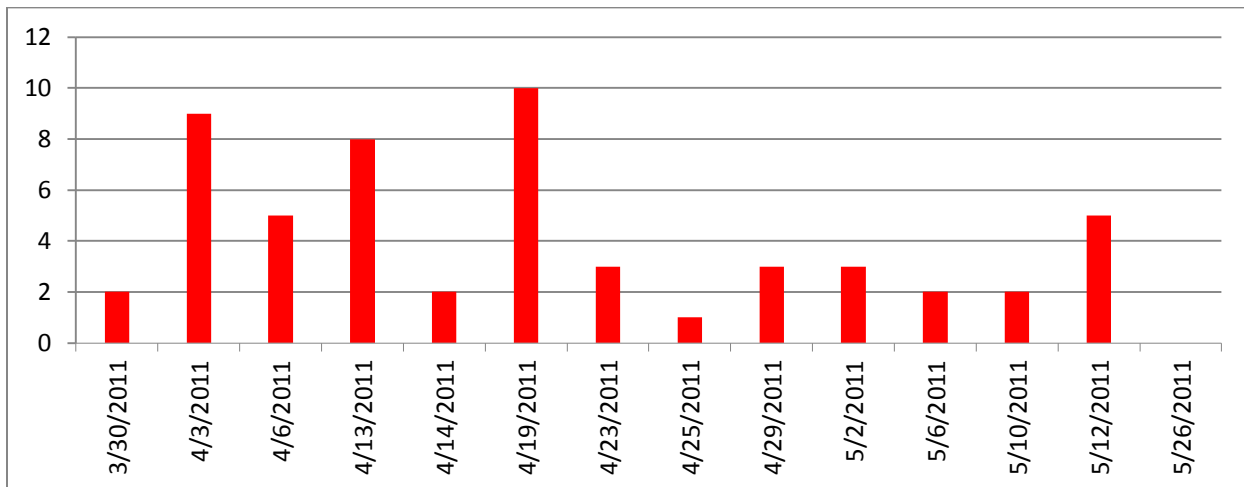


Figure 2. Number of individuals banded per day during the 2011 spring season at the Captain Sam's banding station.

Species richness among captured birds showed a peak that coincided with the peak in individuals banded (Figure 3.) The mean number of species banded (including recaptures) per day was 5.4.

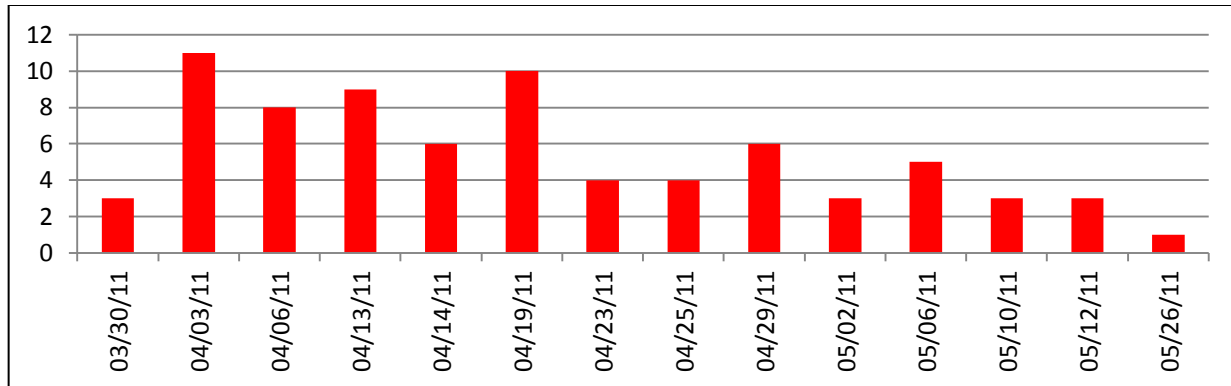


Figure 3. Number of species captured per day during the 2011 spring season at the Captain Sam’s Banding Station.

Gray Catbirds and Painted Buntings were the most numerous species accounting for 31% of the bandings for the entire spring season (Table 1). The first Painted Bunting was banded on 25 April and they peaked during the second week of May when 4 more were banded. The few neotropical warblers that were captured were banded during the first week of April with exception to a Northern Waterthrush which was banded at the end of April.

Table 2. Top 5 species banded at the Captain Sam’s Banding Station during the 2011 spring season.

Species	# Banded 2011	# Banded 2010	Rank 2011	Rank 2010
Gray Catbird	10	22	1	2
Painted Bunting	7	5	2	3
White-eyed Vireo	5	0	3	-
Northern Cardinal	5	4	3	5
Swamp Sparrow	4	2	5	-

Ten species were banded only once: Great Crested Flycatcher, Red-eyed Vireo, Ruby-crowned Kinglet, Northern Mockingbird, Orange-crowned Warbler, Northern Parula, Prothonotary Warbler, Worm-eating Warbler, Northern Waterthrush, Brown-headed Cowbird. In addition, a Ruby-throated Hummingbird was captured and released without banding. Special authorization and training is needed to band hummingbirds.

Second-year individuals represented the majority, accounting for 73% of banded birds, while only 22% were after-second-year, and 5% were of unknown age (Table 2). The skewed ratio of adult to young birds that were observed during the fall and winter seasons is less evident in the spring. Young birds have a higher mortality rate than adults during fall and winter thus their population is reduced by spring.

For many species, sex cannot be reliably determined outside of the breeding season. This explains why 54% of banded birds could not be identified as either male or female. However, by the end of spring, some birds are transforming into breeding condition and can be sexed by the presence of a brood patch (in females) or cloacal protuberance (in males). This was especially evident in species breeding at or near CSBS including Carolina Wren, Great Crested Flycatcher, Northern Cardinal, Eastern Towhee, and Painted Bunting

Table 3. Age and Sex of the top 5 species banded, and all species combined during the 2011 spring season at the Captain Sam's Banding Station.

Species	SY ^a (% of total)	ASY ^b (% of total)	Unknown Age (% of total)	Male (% of total)	Female (% of total)	Unknown Sex (% of total)
Gray Catbird	8 (80)	2 (20)	-	-	-	10 (100)
Painted Bunting	6 (86)	1 (14)	-	4 (57)	1 (14)	2 (29)
White-eyed Vireo	5 (100)	-	-	-	-	5 (100)
Northern Cardinal	2 (40)	-	3 (60)	2 (40)	3 (60)	-
Swamp Sparrow	4 (100)	-	-	1 (25)	-	3 (75)
All Species	40 (73)	12 (22)	3 (5)	12 (22)	13 (24)	30 (54)

^a SY = Second Year (bird born the previous calendar year and generally before its first breeding season)

^b ASY = After Second Year (adult, bird born at least two calendar year before)

Recaptures

There were 52 recaptures of 12 species during the 2011 spring season. Resident birds were recaptured more frequently than migrants and made up 52% of all recaptures. Among the residents, Northern Cardinals were the most frequently recaptured, while Painted Buntings were the most commonly recaptured migrant (Table 3).

Table 4. Top 5 species recaptured at the Captain Sam's banding station during the 2011 spring season. In some cases, the same individual is captured multiple times.

Species	# Recaptured 2011	# Recaptured 2010	Rank 2011	Rank 2010
Northern Cardinal	17	15	1	1
Painted Bunting	9	4	2	5
Carolina Chickadee	6	3	3	-
Gray Catbird	5	8	4	2
Carolina Wren	4	6	5	3

Recaptures are divided into 4 categories: repeats, returns, "foreign" recaptures, and recoveries.

Repeats are individuals that were recaptured during the same season they were banded. It also includes individuals captured repeated during same season. **Returns** are individuals that were recaptured at least one season following banding. **"Foreign"** recaptures are individuals that are captured and released in a different location (10-minute block) than the location (10-minute block) in which they were banded. **Recoveries** are any encounter with a dead bird that has been banded.

There were 30 **repeats** during the 2011 spring season. Half of birds recorded as repeats were resident species and the remaining half were from migrants. There were a few instances of migrant repeats which may indicate a migratory stopover period (Table 4). A Gray Catbird had a minimum stopover time of 11 days. In addition, two Swamp Sparrows had a minimum stopover time of 4 and 2 days, respectively. However, Gray Catbirds and Swamp Sparrows are common winter residents at CSBS. As a result, it is possible that they were not migrants moving through CSBS but simply failed to be captured during the previous fall or winter. A similar situation could be explained for the three Painted Buntings that exhibited a 25, 18, and 9 day stopover period, respectively. Painted Buntings are common spring

migrants at CSBS but they breed there as well. It would be difficult to say whether the Painted Buntings did or did not stay at CSBS during the summer unless they were recaptured during the summer.

Table 5. List of migrants repeats with first and last dates of capture, followed by minimum stopover time during the 2011 spring season. Same-day recaptures (birds recaptured on the same day they were originally banded) were excluded.

Species	First and Last Date of Capture	Minimum stopover time
Gray Catbird	04/13 – 04/23	22 days
Swamp Sparrow	04/03 – 04/06	4 days
Swamp Sparrow	04/13 - 04/14	2 days
Painted Bunting	05/02 – 05/26	25 days
Painted Bunting	04/25 – 05/12	18 days
Painted Bunting	04/25 - 05/02	9 days

There were 22 **returns** during the 2011 spring season. A little over half of the returns were from resident species (55%) that probably never leave CSBS. However, there were some interesting migrant returns (Table 5). A House Wren originally banded on 22 October 2009 was recaptured again during the 2010 spring season. In addition, two Painted Buntings banded the previous spring were recaptured multiple times during the spring season. A White-eyed Vireo banded last fall was recaptured. White-eyed Vireos breed at CSBS but they are rare or absent in the winter. When this bird was banded last fall, it was an adult in breeding condition indicating that is probably bred at CSBS. Recapturing it again the following spring signifies that it most likely returned from further south to breed again. Several returns were from wintering migrants. Most of these birds probably never left CSBS between being banded the previous fall/winter and being recaptured during the spring.

Table 6. List of migrant returns from the Captain Sam’s Banding Station during the 2011 spring season. Entries are sorted by elapsed time.

Species	Original Banding Date	Spring Recapture Date	Time Elapsed (year, month, day)
House Wren	10/22/2009	04/06/2011	1y, 5m, 15 d
Painted Bunting	05/11/2010	05/02/2011	11m, 21 d
Painted Bunting	05/11/2010	04/25/2011	11m, 14d
White-eyed Vireo	08/23/2010	04/29/2011	8m, 6d
House Wren	11/05/2010	04/14/2011	5m, 9d
House Wren	10/29/2010	04/03/2011	5m, 5d
Hermit Thrush	11/22/2010	04/03/2011	4m, 12d
Yellow-rumped Warbler	01/28/2011	04/13/2011	2m, 16d
Gray Catbird	01/28/2011	04/03/2011	2m, 6d
Gray Catbird	01/28/2011	03/30/2011	2m, 2d

Banded birds are infrequently encountered away from the location where they were banded and any reports of “**foreign**” **recaptures** or **recoveries** are extremely significant. There were no “foreign” recaptures or recoveries during the 2011 spring season.

Net Productivity

Twelve nets were placed in scrub/shrub habitat within old vegetated dunes and high marsh (Figure 4). Habitat diversity at CSBS is fairly low, however the area is dominated by low growing shrubs and trees which is ideal for mist-netting birds.

The overall capture rate for the 2011 spring season was 8.6 new birds per 100 net-hours and an additional 7.8 birds per 100 net-hours were recaptures (Table 7). Nets # 4, #8, #9, and #12 were the most productive with capture rates over 20 birds per 100 net-hours. All major cover types (high marsh, wooded, and open dune) were represented by these four nets.

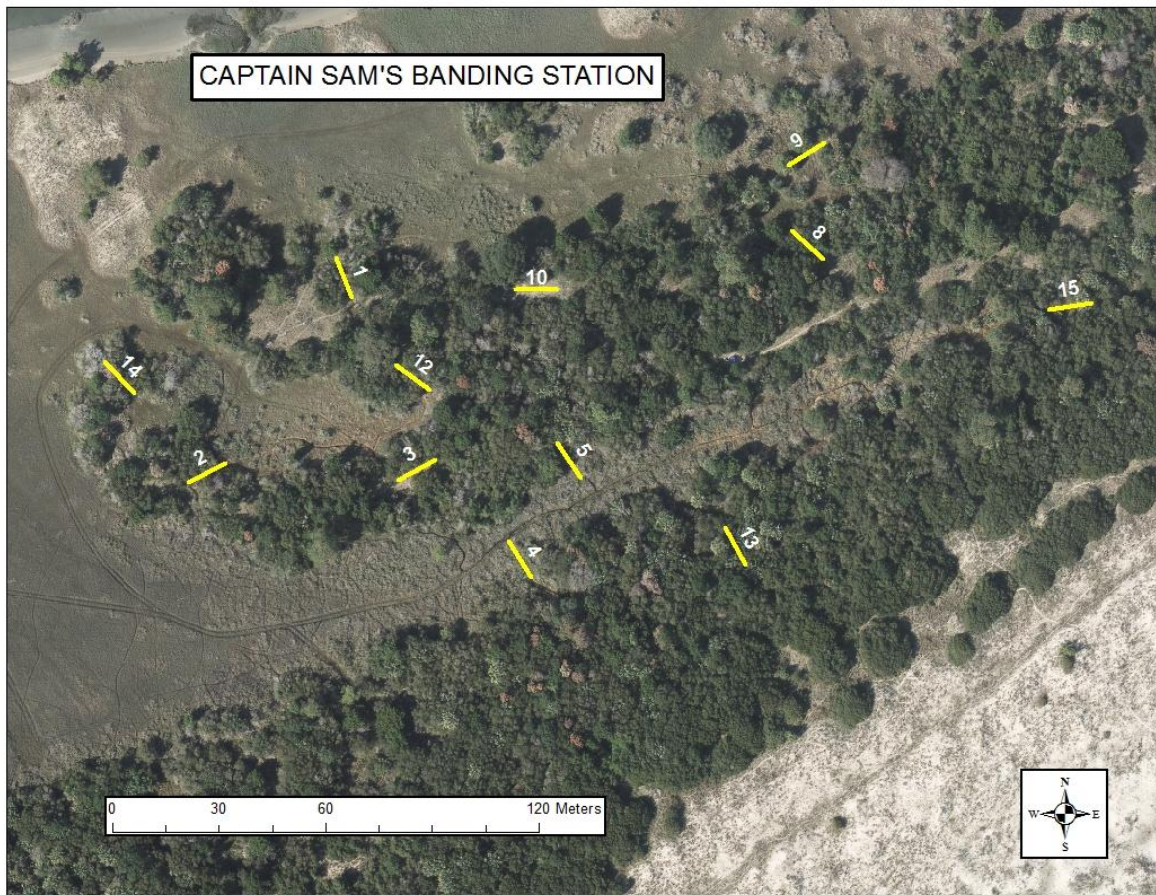


Figure 4. Location of mist-nets at the Captain Sam's Banding Station during the 2011 spring season.

Table 7. Net usage and capture rate during the 2011 spring season at the Captain Sam’s Banding Station.

Net #	Net-Hours	New Captures	Recaptures	Total Birds	Birds per 100 net-hours		
					New	Recaptures	Total
1	56.2	4	6	10	7.1	10.7	17.8
2	56.7	2	4	6	3.5	7.1	10.6
3	56.5	2	7	9	3.5	12.4	15.9
4	56.5	10	3	13	17.7	5.3	23.0
5	56.5	2	5	7	3.5	8.9	12.4
8	56.5	12	3	15	21.3	5.3	26.6
9	53.0	8	4	12	15.1	7.5	22.6
10	47.2	6	3	9	12.7	6.4	19.1
12	56.5	5	7	12	8.9	12.4	21.3
13	55.3	3	5	8	5.4	9.1	14.5
14	46.1	1	3	4	2.2	6.5	8.7
15	24.2	0	2	2	0.0	8.3	8.3
Total	620.8	55	52	102	8.6	7.8	16.4

Paid and Volunteer Hours

For a banding station to run efficiently, adequate personnel are required. A banding station needs properly trained people to remove birds from mist nets, correctly age and sex individuals, and safely apply the band to the bird’s leg. Untrained personnel are also valuable as they can record data, take photos, organize banding supplies, and assist in setting up and taking down nets. A total of 80.75 hours were logged by one paid employee and two volunteers at the CSBS during the 2011 spring season (Table 8). Volunteers were those people which took part in the banding operation without being financially compensated. Paid hours were time spent by individuals being paid by the Town of Kiawah Island. Note that the values shown for “hours” only include those spent at the CSBS and do not include the extensive amount of time spent planning, entering and analyzing data, and writing reports.

Town of Kiawah Island personnel duties and responsibilities:

- Aaron Given – Master permit holder, supervisor of banding station(s), primary bird bander. Also responsible for data entry, data management, data analysis, and report writing.

List of bird banding participants and hours contributed at the CSBS:

Aaron Given (71.5), Jacob Vann (5.75), Will Oakley (3.5)

Table 8. Hours spent at the Captain Sam’s Banding Station by paid employees and volunteers during the 2011 spring season.

Personnel	# of Individuals	Hours
Paid Employees	1	71.5
Volunteers	2	9.25

CONCLUSION

The data gathered from banding birds will add to the knowledge of numerous aspects of avian ecology on Kiawah Island, including: species distribution, migration timing, habitat quality, and population trends. The second spring banding season on Kiawah Island was disappointing, although not completely unexpected. Spring migration (compared to fall migration) is poor along the immediate coast of South Carolina. The low number of birds captured appeared to confirm this assumption. Despite almost doubling our effort from last spring, the overall capture rate and total number of birds banded was substantially less. I don't believe increasing the effort to more than two days a week will increase capture rate. The small quantity of data gathered during the spring was not worth the great amount of time and effort that was put forth. Consequently, the spring migration banding project will be discontinued.

**APPENDIX 1 – Summary of Species Banded and Recaptured at the Captain Sam’s Banding Station
During the 2011 Spring Season**

SPECIES	BANDED BIRDS		RECAPTURES	
	# of Individuals	Capture Rate (# per 100 net-hours)	# of Individuals	Capture Rate (# per 100 net-hours)
Chuck-wills-widow	2	0.3	-	-
Great Crested Flycatcher	1	0.2	-	-
White-eyed Vireo	5	0.8	1	0.2
Red-eyed Vireo	1	0.2	-	-
Blue Jay	-	-	1	0.2
Carolina Chickadee	1	0.2	6	1.0
Carolina Wren	3	0.5	4	0.6
House Wren	-	-	3	0.5
Ruby-crowned Kinglet	1	0.2	-	-
Hermit Thrush	-	-	1	0.2
Gray Catbird	10	1.6	5	0.8
Northern Mockingbird	1	0.2	-	-
Orange-crowned Warbler	1	0.2	-	-
Northern Parula	1	0.2	-	-
Yellow-rumped Warbler	-	-	1	0.2
Prothonotary Warbler	1	0.2	-	-
Worm-eating Warbler	1	0.2	-	-
Northern Waterthrush	1	0.2	-	-
Common Yellowthroat	3	0.5	-	-
Eastern Towhee	2	0.3	-	-
Swamp Sparrow	4	0.6	2	0.3
White-throated Sparrow	3	0.5	-	-
Northern Cardinal	5	0.8	17	2.7
Painted Bunting	7	1.1	9	1.4
Brown-headed Cowbird	1	0.2	2	0.3
TOTAL	55	8.6	52	8.3

APPENDIX 2 – Photographic Highlights from the 2011 Spring Season



Chuck-wills-Widow (after second-year, female). Banded on 04/19/2011. 2nd banding record for the species on Kiawah Island. One of two banded during the spring 2011 season.



White-eyed Vireo (second-year, unknown sex). Banded on 04/03/11.



Northern Parula (second-year, female). Banded on 04/03/11.



Eastern Towhee (after second-year, female). Banded on 04/13/11. Females are distinguished from males by having a brown head – male's head will be black.



White-throated Sparrow (second-year, unknown sex). Banded on 04/03/11.



Orange-crowned Warbler (second-year, female). Banded on 04/19/11.



Ruby-throated Hummingbird (male). Captured on 04/19/11. First hummingbird captured at CSBS. Released without banding.



Prothonotary Warbler (after second-year, male). Banded on 04/03/11. 1st spring banding record for this species.