

Kiawah Island Avian Monitoring Project (KIAMP)

INTRODUCTION

Kiawah Island has been the focus of much research for a variety of wildlife species including diamondback terrapins, loggerhead turtles, bobcats, and white-tailed deer but avian species have received much less attention with the exception of painted buntings. Throughout North America many bird populations are declining (Butcher 2007). Much evidence for these population declines has come from the results of the Breeding Bird Survey (BBS) coordinated by the U.S. Geological Survey (Butcher and Niven 2007). These roadside counts provide excellent baseline data, but they do little to identify the factors contributing to changes in bird populations. Additionally, they are poor at assessing population trends at a local level because they were originally developed to provide regional estimates for states, provinces, physiographic regions, and larger areas (Sauer et al. 2003). A BBS has been conducted on Kiawah Island since 1998 and this data will continue to be valuable to the overall goal of the BBS program. However, in order to appropriately evaluate bird populations on Kiawah Island additional information will be needed. Several monitoring techniques have been investigated including point-counts, strip-transect counts, mist-netting, and nest searching, and it has been suggested using a combination of techniques is advantageous to only using a single method. For instance, point-counts may miss birds that tend to be less conspicuous; however, these species may be captured during mist-netting. Alternatively, mist-nets may under represent species that spend much of their time in the tree canopy but these species can be detected during point-counts. This proposal will outline the objectives, justifications, and methods involved with initiating a new avian monitoring program.

OBJECTIVE

- (1) Assess population trends among breeding and wintering birds through roadside and off-road point-count surveys.
- (2) Evaluate bird populations throughout the residential development of the island at two undisturbed habitats (maritime forest and scrub shrub) using mist-netting.
- (3) Monitor breeding marsh birds following the National Marsh Bird Monitoring Program's protocol.
- (4) Monitor breeding nightjars following the U.S. Nightjar Network's (Center for Conservation Biology) protocol.
- (5) Determine breeding success of beach-nesting birds on the east end of Kiawah Island.

JUSTIFICATION AND METHODS

Point-Counts

The point count method is probably the most efficient and data rich method of counting birds and it is the preferred method in forested habitats (Ralph et al. 1993). With point-counts it is possible to study the yearly changes of bird populations at fixed points, differences in species composition between habitats, and abundance patterns of species.

Birds will be monitored at 218, 5-minute roadside and off-road point-count stations located in all major upland cover types within Kiawah Island except for open dunes and beach. Stations will be systematically placed along secondary and tertiary roads and trails. Off-road stations will be used for parts of the island that are not represented by the roadside stations. The minimum distance between point-count stations will be 250 meters (m) to reduce the possibility of recording the same bird twice.

All individuals heard or seen within a 5 minute period will be recorded. Additionally, individuals recorded during the first 3 minutes will be recorded separately from individuals detected in the remaining minutes. Birds flying over the area will be recorded separately from all other birds. When an individual is detected, the bird's distance from the observer will be recorded in one of 4 distance categories (0-25m, 25-50m, 50-100m, >100m). From the distance data, detection probabilities will be calculated for each species. Each species vary in their conspicuousness making it difficult to make intraspecific comparisons of abundance.

Surveys will be conducted during the summer and winter. Summer counts will be performed during the first two weeks of June when birds are breeding and more easily detected. During this time birds vocalize at much higher rates than during other seasons because they are trying attracting mates and defending breeding territories. Winter counts will take place during the month of January. Typically winter counts are not as reliable as summer counts because the birds are not as vocal. All surveys will be conducted from sunrise to about 10:30 am.

Birds will not be surveyed during periods of inclement weather (e.g. rain, heavy fog, excessive wind).

Bird Banding/Mist-netting

The capture of birds in nets and banding them with a unique identifier can give biologists an insight into the health and demographics of the population of birds being studied (Ralph 1993). Important information on the productivity, survivorship, and movements of many species can be attained a through banding program.

Banding will occur at 2 locations on Kiawah Island: (1) Captain Sam's Spit; 32 acre patch of undeveloped scrub-shrub, (2) Cougar Island; 200 acre patch of undeveloped maritime forest. Due to time constraints and limited manpower most of the banding effort will be concentrated at Captain Sam's Spit. The other site may be used opportunistically during periods when bird abundance may be high (e.g. peak of migration, following a weather front or hurricane).

Banding will occur at least once per month from late August/early September through May. No or little banding will occur during the summer months because birds, especially small species, can quickly overheat and die when left in the net exposed to high heat and direct sunlight. A minimum of 8, 12 m mist nets will be placed at the site so that all mist nets can be checked in a 10-15 min period. Mist nets will be located in areas that are representative of the entire site. Birds captured in the nets will be placed into a holding bag and returned to a banding station where each bird will be banded, aged, sexed, and other necessary morphological body measurements will be taken. Nets generally will be opened for a period of 4-5 hrs (sunrise until approximately 12:00pm) with exception to winter banding. Nets will be open during all daylight hours during winter banding sessions. Nets will not be open during rain, excessive wind, or extremely cold or hot temperatures.

Marsh Bird Monitoring

Marsh birds will be monitored using a standardized protocol developed by USGS for the National Marsh Bird Monitoring Program (Conway 2008) that incorporates a call-broadcast survey methodology. Because many marsh birds are secretive, seldom observed, and vocalize infrequently, broadcast calls will be used to elicit vocalizations during surveys (Conway and Gibbs 2005). Information that can be obtained through this program includes: 1) documenting presence or distribution, 2) estimating density among wetlands, 3) estimating population trends at a local scale, 4) evaluating effects of management actions (i.e. development, hurricanes), and 5) documenting habitat types or wetland conditions that influence abundance or occupancy of marsh birds.

Marsh birds will be monitored at 20 unique points consisting of 2, 10-point routes. Each route will be repeated 3 times during the breeding season when marsh birds are most vocal. The surveys will start 30 minutes before sunrise and will be completed 2-3 hours later or prior to the time when marsh birds cease calling. At each point, a recorded CD with marsh bird calls will be played through a portable CD player with amplified speakers. The CD will include 30 seconds of calls of each focal marsh bird species (black rail, least bittern, clapper rail, king rail, common moorhen, and pied-billed grebe) that are expected breeders on Kiawah Island interspersed with 30 seconds of silence between each species' calls. Data recorded at each point will include species, type of call given, and estimated distance to individual. Additional data on non-focal species, ambient noise levels, weather, water conditions, and habitat can be collected.

Nightjar Monitoring

Nightjars, or goatsuckers, are one of the most enigmatic group of birds in North America. Very little is known about the basic aspects of their biology, habitat use, and population status due to their cryptically nocturnal lifestyle. In recent years, conservationists and the general public have come to share a general sense that populations of nightjars are dramatically declining. However, prior to this program, there was no widespread, long term monitoring strategy to gather vital population information. Gaining an understanding on the precise magnitude and scale of population changes are critical if we are to plot a course for conservation.

Nightjar Surveys are easy to perform and will take less than two hours to complete. Surveys are conducted similar to the USGS Breeding Bird Survey except for special modifications to accommodate nightjars. Volunteers conduct roadside counts at night, when the moon is equal or greater than 50 % illuminated and above the horizon, by driving and stopping at 10 points along a predetermined 9-mile route. At each point, the observer counts all nightjars seen or heard during a 6-minute period. No artificial broadcast of the species call is used.

Beach-nesting Bird Breeding Success

Least terns, Wilson's plovers, American oystercatchers, and black skimmers will be monitored for breeding success on the east end of Kiawah Island. Starting in 2010, we will be conducting some basic monitoring techniques to get an idea of how successful the beach-nesting birds are. Nests will be searched and marked very discretely with tongue depressors. When a nest is found, we will use egg floatation (Hays and LeCroy 1971, Maybee et al. 2006) to estimate the incubation stage of each nest. Nests will then be monitored remotely using a spotting scope every 1-3 days until the eggs have

hatched, chicks have fledged or a nest is suspected of being depredated or abandoned. If a nest is depredated or abandoned we will try to determine the cause (e.g. predator, over-wash, etc.).

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