❖ Conservation Measures and Adaptive Management

Case Study: Virginia Coastal Reserve Predators and Shorebirds

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Purpose and region of analysis:

Beginning in the 1990s mammalian predators were identified as being a major contributor to the decline of breeding shorebirds and colonial waterbirds on the barrier islands of TNC's Virginia Coast Reserve (VCR). The two primary mammalian predators that threaten this suite of nesting birds at VCR are raccoons and red foxes. Red foxes are not native to the VCR and raccoon populations are thought to be artificially supported and increased human populations and associated changes in land use. These species threaten the long term survival of numerous shorebirds and waterbirds, especially beach-nesting species including the federally threatened Atlantic coast Piping Plover. , because of the link between declining shorebird and waterbird populations and increasing mammalian predator populations at VCR, an avian habitat enhancement program through the use of approved mammal removal techniques was initiated in the late 1990s. The program is now a multi-agency partnership, including federal, state, academic and NGO groups, that aims to adaptively and selectively manage mammalian predators along the Virginia barrier islands. Monitoring efforts since the program began have documented increases in the populations of certain shorebird indicator species both in terms of productivity and population size. Continual monitoring of these indicator species is critical to this project's success as it gauges where management has had the greatest impact and how the management needs to be altered year to year to account for changes in mammal populations, shorebird productivity, and nesting areas. Without monitoring, this adaptive management cycle would not be possible. The ultimate objective of this work and monitoring is to establish and maintain sufficiently high reproductive rates for local nesting shorebird and colonial waterbird species to maintain stable or increasing populations. This monitoring program has become a classic adaptive management case study: using monitoring data on bird productivity, populations, and mammal populations to develop management strategies and priorities for the upcoming year.

Criteria/Methods:

Avian habitat enhancement through the use of mammal predator control began at the VCR in the 1990s. Currently, all mammalian removal activities are conducted by professionals from the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services program on a contract basis. The scope and intensity of monitoring efforts for shorebird species has varied over the lifetime of this project. In 2005, TNC and the Virginia Department of Game and Inland Fisheries (DGIF) received funding for intensive shorebird and colonial waterbird surveys and monitoring in order to gauge the success of mammalian predator control. Three species of shorebirds, Piping Plover, Wilson's Plover, and American Oystercatcher, and six species of colonial waterbirds were surveyed for productivity rates and population size over three years. Standard techniques were used for assessing population size of solitary nesting shorebird species (plovers and oystercatchers) and colonial nesting waterbirds (terns and skimmers).

Shorebird and waterbird productivity was monitoring efforts included locating breeding pairs and their nests and observing all nest attempts/broods until the broods either fledged or failed. Monitoring was generally reported as a measure of the number of young fledged per breeding pair of each species.

American oystercatcher young have also been banded since 2004, using the protocol developed by the American Oystercatcher Working Group in 2004. Hatch year birds were banded with individually unique, field-readable color bands so that biologists can trace future sightings of those birds directly to their natal site. While banding activities were not originally a part of the avian habitat enhancement program, results from those efforts have contributed important information used in evaluating the success of the program.

Products/Outcomes:

Ongoing project results are provided in annual reports. Results to date have not been published, but manuscripts are currently being prepared. In addition, the study results in new birds being banded every year, which is a major factor is demonstrating the success of monitoring.

Tools and Data:

An important monitoring tool for the program is banding of shorebird young. This has provided critical evidence that the mammalian predator management is having a positive effect on shorebird populations, as young birds recruiting into the breeding population and contributed to documented population increases can be positively linked to their natal territories at managed sites at VCR.

Strengths and weaknesses:

One of the strengths of this project is its continued use of the same contractors to do all the mammalian predator management activities. Without contractor turnover it is easier for them to navigate the VCR islands and know where hotspots of mammal activity are and the best ways to implement management strategies.
Another strength is the solid partnerships that this program has developed prior to and during implementation. TNC works with federal, state and academic partners in all aspects of planning and implementation of the program which strengthens the program itself as well as making the program attractive to potential donors. An example of the benefit of the partnerships is that TNC's federal partners at USDA completed an environmental assessment, in accordance with the National Environmental Policy Act, of managing predators on Virginia's coast for the benefit of native nesting birds, which received a Finding of No Significant Impact.

A weakness of the program is that datasets generated were not as statistically sound as desired. As resources allow, some of these concerns are being addressed for future planning. Additionally, long-term funding for the program is not in place and annual efforts to secure funding are becoming increasingly more difficult.

Suggestions for others:

There seems to be a balancing act between making studies and monitoring scientifically sound versus implementing them quickly and using them for efficient land management. For example, efforts at VCR would have ideally included pre-control surveys and have had a more sound study design up front to establish baseline data. However, doing this would have had potentially drastic implications for shorebird and waterbird populations as they were already in precipitous decline when the program was implemented. Managers must evaluate how and when to best implement management strategies so that they are meeting their conservation goals in a timely fashion with regard to the need and threats at hand, but while also weighing the costs and benefits of the extra resources and time required to develop a scientifically sound study design so that the results of management efforts can be published in the scientific literature and be widely available for other resource managers to reference.

References:

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