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Cover photograph –Barn Owl (*Tyto alba*) at Owl’s Hole Pit Cave courtesy of Elyse Vogeli

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A BRIEF HISTORY OF THE KIRTLAND'S WARBLER RESEARCH AND TRAINING PROGRAM

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“...The Bahamas greatest needs are massive public and decision-maker education and intensified scientific research.”

Pericles A. Maillis, Past President, Bahamas National Trust¹

ABSTRACT

In this paper we present a synoptic history of the Kirtland's Warbler Research and Training Program and projected future work. The Kirtland's Warbler Research and Training program is focused on (1) describing the wintering ecology of the endangered Kirtland's Warbler, *Dendroica kirtlandii* and linkages to the breeding grounds, (2) evaluating the ecology of species associated with Kirtland's Warbler, and (3) building Bahamian conservation capacity by training Bahamian students and facilitating continuation of their education. The future of the project lies in strengthening the education program, continuing to work with land owners and commonage committees on Eleuthera, and initiating experimental management treatments to determine conditions favorable to establishment of key fruiting species used by Kirtland's Warblers.

STATUS OF KIRTLAND'S WARBLER

Populations of many Neotropical/ Nearctic migrant bird species are declining (Sherry 1996.)

Factors responsible for population declines are likely species-specific, and are due to a combination of winter, breeding or migration events (Sherry 1996) and interactions between them. An understanding of their ecology, including seasonal interactions is fundamental to the conservation of these species (Norris and Marra 2007).

The Kirtland's Warbler, *Dendroica kirtlandii* (henceforth KW), a Neotropical/Nearctic migrant, is one of North America's rarest songbirds. The KW, discovered in 1851 breeds almost exclusively in northern Michigan and winters in the Bahama Islands. (Mayfield 1983, 1992) In the 1970's the species reached an all time low of approximately 171 singing males (Weinrich 1995) The KW was added to the endangered species list in 1973. Subsequently resources were made available for protection and management of this species (U.S. Fish & Wildlife Service, 1985.) This intense conservation effort entailed control of a brood parasite, the Brown-headed Cowbird (*Molothrus ater*), and the management of jack pine forests to produce large stands of five to 20 year old jack pines. The result has been a population increase to approximately 1,700

singing males by 2007 (US Fish and Wildlife Service)

KIRTLAND'S WARBLER RESEARCH AND TRAINING PROGRAM: PURPOSE AND GOALS

The management strategy employed in Michigan has been very successful. However, little attention was focused on the wintering habitat. It was assumed there was no significant threat to their survival on The Bahamas (Mayfield 1992). However, some have feared that this assumption may be wrong. As a majority of the virgin pines within the Bahamas have been harvested (Haney et al 1998) and coppice is regularly disturbed for slash and burn farming and development (Currie et al 2005) both activities, may possibly increase in intensity in the future. Researchers in the past have attempted to provide more qualitative data on the KW's distribution and winter ecology, but their efforts often provided little or no information due primarily to the cryptic nature of the KW on the wintering grounds and its low population at the time. Until recently there were records of only 200 KW found within the last 150 years in the Bahamas (Haney et al 1998.) Most of these records were of individuals observed once. The work of Sykes and Clench in the 1980s is the only exception; they were able to observe a single male which returned to specific site on the island of Eleuthera over consecutive winters.

The work of Sykes and Clench still left gaps in our understanding of ecology of the KW in The Bahamas. In an effort to remedy this in August 1996 Dr. Dave Ewert (Great Lakes Program, The Nature Conservancy [TNC]) and Dr. Joseph Wunderle Jr. (International Institute of Tropical Forestry) discussed the potential for studying the Kirtland's Warbler in the Bahamas with Eric Carey (then with the Bahamas government Department of Agriculture) and the Bahamas National Trust (BNT), the Bahamian organization responsible for oversight of national parks and

environmental issues in The Bahamas. . They found strong interest in developing a collaborative Bahamas-US KW project that included increasing conservation capacity in The Bahamas. During this meeting they developed working relationships with each other. Over the years this relationship continued to develop focusing attention on strengthening the Bahamian-Michigan connection to facilitate the protection of the Kirtland's warbler in the Bahamas while building the conservation capacity to execute conservation objectives locally. This relationship led to The Kirtland's Warbler Research and Training project.

The Kirtland's Warbler Research and Training project has two principal objectives: (1) obtain information on the habitat use and winter ecology of Kirtland's Warblers and associated resident and migrant species, and (2) train Bahamian students to increase conservation capacity in The Bahamas. Therefore, we are providing the scientific basis for Kirtland's Warbler conservation in the Bahamas as well as guidance and training needed by Bahamians to implement KW conservation on the wintering grounds. These objectives were identified as priority needs in the KW Recovery Plan (U.S. Fish & Wildlife Service, 1985) and supported by the KW Recovery Team. To insure implementation of conservation we work collaboratively with Bahamian and U. S. agencies and organizations responsible for KW protection so that when the research is completed there will be groups primed to act on this information.

We believe this project is essential for protection to take place. Without information on the winter ecology of KWs, and trained Bahamian conservationists available to apply this information, KW protection in The Bahamas is compromised. Our work is the catalyst for any future conservation. We have maintained a sharp focus on building the information base, needed training, and recruiting partners who can assist with research and training. Equally important, we work with organizations that have the mission and capacity to implement conservation for KWs in both the U.S. and The Bahamas to increase the

probability that results from our project will be applied by these organizations. The result of this approach is a comprehensive program for the protection of the KW, and associated species.

PROJECT HISTORY

Getting Started

At the Society of Caribbean Ornithology meeting held in Nassau, The Bahamas on August 1996, Ewert and Wunderle discussed the potential for a KW Project with Eric Carey (then employed with The Bahamas Government) and The Bahamas National Trust (BNT), The Bahamian organization responsible for oversight of national parks in The Bahamas. During this meeting Ewert, Wunderle and Carey found strong interest in developing a collaborative Bahamas-US KW Project. There was special interest in increasing conservation capacity in The Bahamas. Steps to further this discussion were taken in June 1997 when a team representing The Bahamas (Eric Carey, Paul Dean, Aileen Bainton and Rick Oliver) visited Michigan. This trip was intended to (1) provide the team opportunities to see KW's and their habitat, (2) develop working relationships with members of the KW Recovery Team, (3) visit sites of other conservation projects relevant to The Bahamas (e.g., Piping Plover work). The team from The Bahamas decided that any KW Projects should include a significant training program for aspiring Bahamian conservationists

In February 1998 the Bahamian/Michigan partnership developed further. Eric Carey, Dave Ewert, Dave Mehlman, Rick Oliver, Mike DeCapita, Phil Huber, Dave Lee and Chris Haney developed a 14-day project that focused on (1) Michiganians meeting Bahamian officials and representatives of the Bahamas National Trust, (2) giving presentations in Nassau and Freeport that were hosted by BNT and government officials, (3) learning first hand of Bahamian conservation issues, and (4) seeing KW's winter habitat. During their visit, approximately 10 days was

spent searching for KW's in pinelands on New Providence and Grand Bahama during which five potential sightings of KW's were made (unpublished report). In 1999, to facilitate regular reporting on KW's in The Bahamas, Eric Carey was appointed to the KW Recovery Team. He is also the only non-US citizen on a US Recovery Team. Regular reports from The Bahamas are now featured at every Recovery Team meeting.

In January 2001, based on a set of shared goals and objectives for the study of the KW in the Bahamas and building Bahamian conservation capacity, Wunderle, Ewert, and Carey wrote the first KW Research and Training proposal/study plan and submitted it to International Programs, United States Forest Service (USFS) in 2001 as part of the package of TNC Projects presented to the International Program of USFS by the Migratory Bird Program of TNC. The study plan was circulated to the KW Recovery Team for their review and approval and presented by Wunderle, Ewert, and Carey for discussion at the Recovery Team Meeting in Michigan in Feb. 2001.

January 2002, six years of relationship building came to fruition. Carey, Ewert and Wunderle met with representatives of the College of the Bahamas (COB), The Bahamas Department of Agriculture, BNT, the Ornithology Group of the BNT, and The U.S. Embassy and field work was initiated on Andros.

Field Work

Fieldwork began on Andros, because it was thought wintering KW were concentrated in pine habitats (Haney et al. 1998). In addition, a new national park had just been created on Andros and information from the project would be directly applicable to the park management plan. One and possibly two KWs were found by the project in three months of fieldwork on Andros. That same year, The Ornithology Group of the BNT, led by Paul Dean, located six KWs in March 2002 on

Eleuthera where Wunderle banded six KWs. As a result, the project moved from Andros to Eleuthera in October 2002, to study the KW population on Eleuthera.

In November 2002 the team was joined by Dave Currie (from the United Kingdom) the project's Field Director. His previous research and conservation experience leading an avian research and training project for island bird conservation in the Seychelles Islands, provided invaluable experience for the KW project in The Bahamas.

The field season between November 2002 and May 2003 proved to be more productive than the three months previously spent on Andros. At the end of the season in May 2003 a press conference was held at BNT led by Eric Carey with the assistance of Dave Currie, Lynn Gape and one of the project's students, Leno Davis, to announce the unprecedented discovery of 30 KWs (including the first bird banded in Michigan seen in The Bahamas) at 12 sites on Eleuthera. The following five field seasons built upon and significantly expanded the project. By April 2007 the project had banded a total of 152 Kirtland's Warblers in the Bahamas.

In the summer of 2005 we believed we had collected enough data through the use of radio telemetry, measures of resource availability, vegetation structure associated with KWs and remote imagery to begin to understand the wintering ecology of the Kirtland's Warbler. In June 2005 we presented the project's preliminary research and training results were presented to the 11th Natural History of the Bahamas Symposium, at the Gerace Research Center of the College of the Bahamas on San Salvador, Bahamas (Wunderle et al 2007). In addition, the preliminary results and their conservation implications in The Bahamas were presented by Wunderle in a seminar to the KW Recovery Team for discussion and recommendations.

Preliminary results of the search for Eleuthera-banded birds found in Michigan were presented by Ewert. In August, Wunderle presented to the American Ornithologists Union Annual Meeting

in Santa Barbara, CA. (Abstract published) thus providing a basis for feedback from the scientific community. In January 2006, the project's preliminary research and training results were presented in The Bahamas at the Abaco Science Alliance meeting at the invitation of the Friends of the Environment, an Abaco-based conservation NGO, Great Abaco, Bahamas by Wunderle.

Jennifer White became project director in October 2006; She has experience in both bird research and conservation with a Ph.D. from The University of Missouri where she taught university courses in ecology and ornithology. Her arrival initiated a shift in research focus from a basic understanding of ecology of the KW to a more detailed look at the mechanisms influencing fruit availability and habitat variation.

During the summer of 2004 the first systematic searches for Eleuthera-banded birds in Michigan were initiated. The search for Eleuthera banded KWs on the breeding grounds is continuing in collaboration with Kimberly Hall (Michigan State University), volunteers and staff from Huron-Manistee and Hiawatha National Forests and the Michigan Department of Natural Resources. In June 2007 a Bahamas banded Kirtland's Warbler was found in Wisconsin, this coincided with the first documentation of nesting KW in Wisconsin. Approximately 35 Bahamas-banded Kirtland's Warblers have been found on the Kirtland's Warbler breeding grounds as of 2007.

Building Capacity

The Kirtland's Warbler Research and Training is designed to provide students with the opportunity to spend two field seasons in the Bahamas studying the KW and learning research techniques before being granted a scholarship to assist them in completing their undergraduate degrees. Most of the students have graduated from COB with an Associate degree or would have transferred to the program at a second year standing, thus needing to complete their Bachelor's of Science degree

(B.S.) Funding support provided by TNC Bahamas (2003 -present) provides partial scholarships to Bahamian students working on the project. The scholarship provides \$30K over 2 years to assist students in obtaining advanced degrees at US universities. Students are also afforded the opportunity to travel to Michigan during the summer, after their first season to intern with the United States Forest Service, Michigan Department of Natural Resources and The Nature Conservancy, thereby expanding exposure to an array of conservation practices and approaches.

The project was initiated with Ancilleno Davis and Jasmine Turner in January 2002. Subsequently, Zeko McKenzie, Ingeria Miller, Keith Philippe, Everton Joseph, Montara Roberts, and Samara Lawrentz have participated in the project. These students, with support from grants and donors to The Nature Conservancy and host institutions, have attended Cornell University, the University of Maryland-Eastern Shore, University of Minnesota, and Northern Michigan University. Three students have completed their B.S. degree, one completed his M.S. degree, one is currently enrolled in undergraduate work and another is attending graduate school.

While in the field all students participated and lead project outreach activities. In 2003 a color brochure describing training and research objectives and activities of the KW project was printed with funds from a donor to The Nature Conservancy. The brochure was posted in local businesses and schools and provided to landowners and commonage committees in the vicinity of study sites; a revised brochure continues to be used for these purposes. By 2005, the project's students had given presentations on the project and encouraged primary school students at Rock Sound, Wemyss Bight, Greencastle, and Tarpum Bay created KW artwork for a KW calendar contest sponsored by Kirtland Community College, Roscommon, MI. Selected entries were displayed locally at the Rock Sound government administrative centre on

Eleuthera. All entries were sent to Kirtland Community College. Entries from five Eleutheran students had won a spot in the calendar and their artwork displayed in the 2005-2006 KW calendar from Kirtland College. These calendars were distributed locally to pupils at participating schools, landowners, commonage committees, Rock Sound administrative centre, local business owners, and others on Eleuthera as a way of increasing interest in KWs and the project.

FUTURE OF THE PROJECT

The project will continue to focus on obtaining information needed to identify and manage KW habitat, building conservation capacity in The Bahamas and building a strong Bahamas-U.S. linkage to facilitate flow of information and funding to support KW work in The Bahamas.

Our original hypotheses regarding the distribution and ecology of the KW, and thus conservation approaches, have been strongly modified by our research findings. Instead of a near-exclusive focus on fire management in pine systems on crown lands (i.e., government), our focus has shifted to early succession coppice habitat. Mechanisms for protection and management of early succession coppice at both site and landscape scales need to be identified. However, we still need to determine KW's use of pine areas, or other habitats on pine islands as recommended by the Recovery Team.

Through our work it has become evident that working with private land owners is likely to be an important means of protecting and managing land for KWs on at least Eleuthera. Many private landowners and commonage committee have been cooperative and supportive of the project and have permitted project research to be conducted on their lands. Work to date underscores the need to encourage Bahamians, ideally native to each

island where KWs are in sufficient numbers to justify a conservation program, to work with local landowners. It is also important to provide Bahamians with conservation tools that can be adapted to The Bahamas.

Strengthen education program.

The education program is succeeding to date. The College of the Bahamas provides credit for students working on the project and has recently created scholarships for Eleuthera students to attend the College of the Bahamas. The ultimate success of such a program is contingent upon availability of jobs for students. Efforts need to continue to be made, then, to raise funds to support new conservation or conservation-related jobs.

PROJECT AWARDS, PUBLICITY, SELECTED PRESENTATIONS

Awarded the Partners in Flight *Contributions of Bird Conservation* award in 2003.

Awarded the U.S. Forest Service *Wings across Americas* award in 2005

Featured in national and international publications: *Audubon Magazine*, *Birder's World*, *BirdLife International*, *Nature Conservancy Magazine*, *North American Birds*, *World BirdWatch*.

KW Project Field Director, Dave Currie, received Bahama National Trust Award for his contributions to Bahamian conservation, April 2006. The Prime Minister of the Bahamas, Perry Christie, was in attendance.

Presentations: Eleuthera primary schools, Green Castle, Rock Sound, St. Anne's, Weymss Bight,

Tarpum Bay (Eleuthera, Bahamas) commonage committees, Abaco Science Alliance & Friends of Environment – Abaco, Bahamas National Trust, Gerace Research Center – College of the Bahamas-San Salvador, College of the Bahamas-Nassau, Society for Conservation and Study of Caribbean Birds, American Ornithologists' Union, The Nature Conservancy, Northern Michigan University, Wisconsin Ornithological Society, Northern Michigan University, various Audubon Societies, Michigan Audubon Society, Kirtland's Warbler Festival, Michigan Department of Natural Resources, Huron-Manistee National Forest.

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University of Maryland-Eastern Shore, University of Minnesota, The Nature Conservancy, Northern Michigan University, and the U.S. Fish and Wildlife Service (Neotropical Migratory Bird Conservation Act).

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