Kirtland's Warbler Legacy Project

Synopsis

The Kirtland's Warbler Recovery Team was appointed by the U.S. Fish and Wildlife Service under the 1973 Endangered Species Act. The team membership was chosen to represent the three managing agencies (Michigan Department of Natural Resources, U.S. Forest Service, and U.S. Fish and Wildlife Service) and private interests to contribute the essential expertise in natural resource management for recovery of this critically endangered, highly specialized, migratory songbird. The team wrote a recovery plan that optimized multiple use of managed habitats for recreation and pulp timber production. Habitat closures were recommended only during the 12 weeks of the nesting period and commercial rotation of jack pine for the pulp timber industry was promoted rather than regenerating stands when the warbler abandoned them at 20-24 years of age. These decisions reflect sensitivity to the natural resource user groups of the agencies on the team. However, the team did have to adjust early decisions in the program with other user groups. For example, the relationship with Camp Grayling, a training base for the Army National Guard was extremely contentious. Several confrontations occurred before team members and the Camp Grayling staff began constructive talks to resolve the land use conflicts. Two key Memoranda of Agreements between the National Guard and Michigan DNR paved the way for an enduring partnership of trust and mutually beneficial resource management. In addition, the recovery team learned a hard lesson about providing adequate public education programs to inform the public about the early-succession habitat management program needed for the warbler. Today, the team is partnered with Kirtland Community College to host the annual Kirtland's Warbler Wildlife Festival that educates both local and out-of-state people about the benefits of Kirtland's Warbler management and other wildlife programs. After 30 years of lessons learned, the Kirtland's Warbler Recovery Team and a large supporting cast have successfully brought the Kirtland's Warbler to biological recovery, and are working on a comprehensive Conservation Partnership with National Fish and Wildlife Foundation to secure the perpetual management of this completely conservation-reliant species. This new public/private partnership hopes to move the Kirtland's Warbler beyond the protection of the Endangered Species Act.

Newer team members benefit from lessons learned by their predecessors only to the extent those lessons are shared through the continued attendance of emeritus team members. The current recovery team is extremely concerned about losing the institutional knowledge and insight gained in over 30 years of hard work and wisdom contributed by original and early team members. Therefore, documenting and archiving the conservation planning of the Kirtland's Warbler Recovery Team is very important and benefits the current Kirtland's Warbler recovery efforts and the vast array of other conservation-reliant species on the lists of Threatened and Endangered Species (80% of which are at least partially conservation-reliant). Perhaps more importantly, many other high priority species, including candidate species, are conservation reliant. The lessons learned and decision-making process of the Kirtland's Warbler Recovery Team may help these future teams avoid problems.

The purpose of this project is to interview remaining early team members and partners, to gather the papers, pictures and videos that document the history of the team's recovery planning process, and to summarize and archive these items to share with the conservation community, present and future.

Archive of Kirtland's Warbler Recovery

Submitted by Elaine Carlson
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Acknowledgments

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There seemed to be something truly remarkable about the original Kirtland's Warbler Recovery Team. In 1975 this group represented the best qualified and most appropriately positioned candidates that could be asked to serve. However, the original team was divided on issues and had to work to get along with each other. Though experienced, the original team faced uncertainty in guiding Kirtland's Warbler habitat management, yet strongly influenced the ultimate success of the recovery program by staying with their convictions. Despite the positive impact of the early cowbird control efforts on warbler reproduction, overall KW population growth was stagnant from 1971 to 1989. No other team to date has experienced the frustration of the warblers' low numbers and non-existent population response to nesting habitat management, the one thing most believed would make a difference for the bird. The original Recovery Team was not in place when the Kirtland's Warbler population turned upward after the Mack Lake Fire, but I have been privileged to personally experience their collective strength, individual dedication to the warbler cause, and witness their legacy.

Introduction

Interest in documenting the Kirtland's Warbler (*Dendroica kirtlandii*) (KW) recovery story has grown over the years. It is recognized that institutional memory is fading as members move to other jobs, retire or pass away. Files and other written records become scattered, obsolete, and more difficult to access. The long-time associate member of the Kirtland's Warbler Recovery Team (KWRT) often reminds the group of the importance of a documented historical perspective. In 2010, a proposal to create an electronic archive was prepared by an ad hoc archive planning committee that included recent and past employees of Michigan Department of Military Affairs (MDMA), the US Department of Defense (DOD) Partners-In-Flight Coordinator, and present chair of the KWRT. The Legacy Program of DOD funded the proposal to hire a communications and archive specialist to physically collect and electronically archive an assortment of material related to the KW. Personal interviews with selected individuals (Appendix A) were to be conducted and included with the archive. A summary of the history of the KWRT was to be prepared and this document fulfills this requirement.

Since the first KW was collected and described in May 1851 near Cleveland, Ohio, the bird has benefited from the interest of a diverse conservation-minded community, including ornithologists, amateur naturalists, and natural resource professionals from the public and private sector. They provided the life history information and hands-on management expertise needed to implement strategies designed to protect this rare and unique species and perpetuate its breeding habitat presently restricted to young Jack Pine (*Pinus banksiana*) in the upper Great Lakes. The warbler was federally listed as endangered in 1967 and is still listed today, though the minimum population goal called for in the Recovery Plan has been met for more than 10 years. The KWRT was established in 1975 and meets twice annually. It is presently made up of members from several government agencies from Michigan, Wisconsin, and Ontario, Canada, private sector interest from the Bahamas, and academia. The meetings are regularly attended by representatives from the MDMA and many interested parties. While KW recovery efforts in Michigan have escaped some of the intense public scrutiny given to other imperiled species such as the Gray Wolf (*Canis lupis*), there were several challenging issues to be addressed, such as public opposition to large clear- cuts, negative public opinion after the Mack Lake Fire, and early strained relationships with the Michigan National Guard (MNG). In addressing these issues the KWRT displayed several characteristics that led to its success: proper and honest intentions, use of science in decision-making, professional knowledge, willingness to engage a variety of partners, and persistence. All of this effort will still be needed to ensure the warbler's future, now under the protection of the Endangered Species Act, and beyond with protection of a new *Conservation Partnership,* a public/private venture with the National Fish and Wildlife Foundation. A sustained commitment for biological diversity will be the ultimate success, and the lessons learned by the KWRT may help facilitate this end.

The Project

From August 2010 through March 2011, documents related to the KW recovery were gathered by visiting Michigan offices of the various agencies involved in the program and gaining access to a few personal and other public collections. Original documents were scanned upon permission into a single digital file. Material made available to the project included those from the USFS (Huron-Manistee, Hiawatha, Ottawa National Forests (NF)), MDMA (Camp Grayling), MDNR (Lansing Wildlife Division, and Roscommon Operation Services Center), USFWS (Seney National Wildlife Refuge, Lansing, and Marquette offices), Michigan Audubon Society (MAS), the University of Michigan's Museum of Zoology (Harold Mayfield's personal collection), Kirtland Community College (KCC) (Kirtland's Warbler Wildlife Festival), the State of Michigan Archives, and the personal collections of Bill Irvine (retired USFS biologist and original KWRT member), Wesley Hall (interested citizen involved with the KW monument), and Mike Petrucha (skilled birder and volunteer who has followed the migration records of KW). Out-of-state documents were received from the WDNR, Ontario Ministry of Natural Resources, and Canadian Forces Base (CFB) Petawawa (Ontario). Included in the archive were all legible documents deemed valuable for illustrating interagency cooperation and decision-making among the members of the KWRT, as well as documents with interesting historical value as determined by the contract archive specialist. The archive itself was organized into broad categories and includes articles, Recovery Plans, press releases, correspondence, publications, agency agreements, photographs, and others.

By April 2011, the archive specialist had completed the electronic database and one of the interviews but chose to leave the project for a full-time job. Another contractor was hired to complete the remaining interviews and write the archive summary. Originally, nine interviews were scheduled with people who represented long involvement in the recovery program, different aspects of the effort, and all the cooperating agencies. The original contractor conducted an interview with two individuals from KCC most involved with the KW

Wildlife Festival and was somewhat unstructured. The other eight interviews followed a set of questions prepared by the archive planning committee (Appendix A). With a few changes for clarification and/or readability, the questions were previewed with the interviewees and seven individuals answered the full set of questions. These casual but structured interviews were recorded in person or by telephone and lasted 1.5 -2 hours. The interview planned with the KW colleague from Ontario was altered significantly and responses were made to questions more directly related to the warbler in Canada. This phone interview lasted about 1 hour.

The original list of people to be interviewed was expanded to capture more details of the recovery effort. An additional 20 people were interviewed and recorded for the archive project, including nine who had worked for or were presently employed by the MDNR, Wildlife Division; four past and present employees of the MDNR, Forest Resources Division; four past and present employees of the USFS; two present employees of the USFWS, and one individual representing the Detroit Audubon Society. These people had knowledge of the KW recovery program, representing field involvement, administrative responsibilities, research, and personal interest. Questions were tailored to their specific expertise and interviews lasted from 20 - 90 minutes each.

The KCC Library volunteered to house both the digital and paper versions of the archive. The school's many years of involvement with the educational and outreach aspects of the recovery made this an excellent and convenient choice.

The following discussion is based on review of selected items in the KW electronic archive, a summary of the interviews, and support from a few publications that pertain to natural resource conservation issues or endangered species management. Though funding challenges are frequently mentioned in the archive documents and are an integral part of the recovery story, this summary does not have detailed information about how the warbler program was funded. Minutes of the early KWRT meetings appear to have been edited before distribution and discussion that may have added to a more thorough understanding of events were likely not available to archive. Consequently, this discussion includes some interpretations of the historical record by the author.

Early Efforts

Understanding the biology of the KW began slowly but with remarkable clarity when the first nest was discovered in July 1903, near the AuSable River in rural Oscoda County, Northern Lower Michigan (1). Prior to that time, the species was known only from specimens assumed to be collected on migration or wintering grounds. As early as 1898, this warbler was considered rare due the scarcity of such samples (2). By 1920, at least one observer recognized the importance of young Jack Pine to the bird and that wildfire may actually control population distribution and abundance (3). Advancing the idea of fire as beneficial would have been quite contrary at the time. A more common view was given by Norman Wood, the individual who discovered the first nest, when he wrote in 1926 that fire was the greatest menace to KW colonies (4) yet this author appeared to understand the connection between fire and KW habitat. In the same article, Wood reported 70,000 acres burned in Crawford and Oscoda Counties in early 1925 and concluded that there was "… no limit to the suitable habitats at present..." Of course, serious wildfire prevention programs in Michigan, starting about 1927, would eventually significantly reduce the amount and quality of essential habitat, threatening the bird's survival.

Brown-headed Cowbirds (*Molothrus ater*) (a species that uses nests of other birds in which to lay its eggs and raise its young) may have been in northern Lower Michigan in the 1880's and an early recorded observation of cowbird parasitism on KW's was noted in 1921, when a KW nest with cowbird eggs was reported from Iosco County (3) Writing about a 1923 trip to KW country, Leopold (5) suggested that cowbird parasitism was the reason for the bird's scarcity. He remarked that the population was declining and feared the bird would be

extinct. Many other observers would raise similar concerns but cowbird control in KW habitat would not be accomplished on a large scale at least, until almost 50 years later.

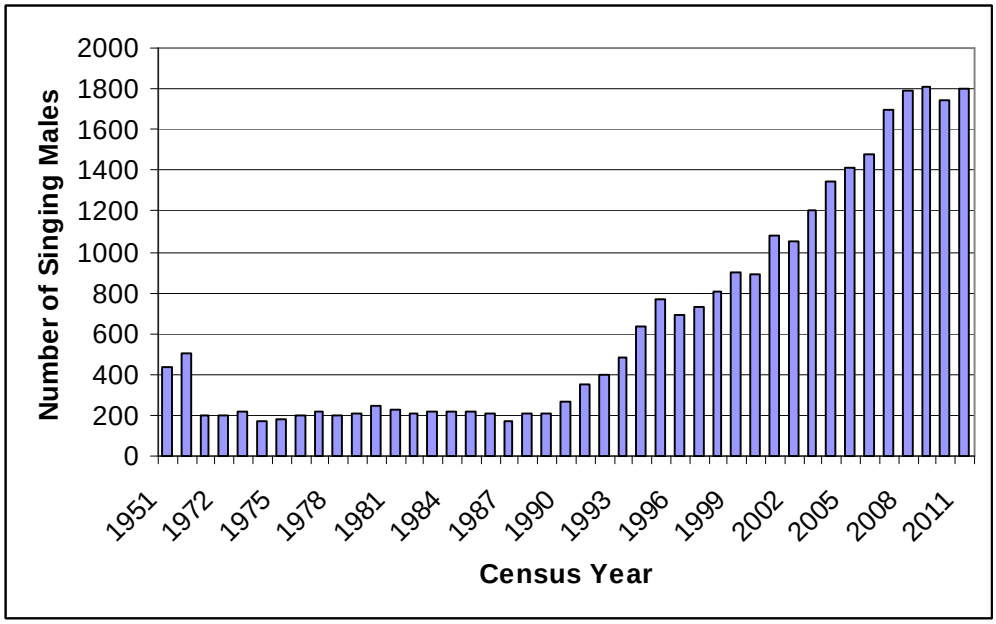
In 1930, Josselyn VanTyne from the University of Michigan began his long-term study of the KW. The results were published in book form by one of his field collaborators, Harold Mayfield (6), an avid birder and businessman from Ohio, after Van Tyne's untimely death in 1957. This book stands as an important document of KW life history and one of many contributions to KW recovery made by Mayfield.

Another exemplary early student of the KW was Dr. Larry Walkinshaw, a dentist from Muskegon, who began nest checks, banding young, and documenting the extent of Brown-headed Cowbird parasitism in the 1930's. He continued his field work monitoring nest success and the fate of individual birds through the 1970's. This author made an interesting and prescient comment about time spent in north central Wisconsin looking for KW. While he did not find a bird, he remarked it "…seems logical that it will eventually be found in Ontario, Wisconsin and possibly Minnesota breeding…" (7) Unfortunately he did not live long enough to learn his deduction would come true.

Pioneers Point the Way

In the late 1940's, Roger Tory Peterson suggested to Bill Bull, birder and educator with the then Michigan Department of Conservation, a count of the KW population might be feasible. Bull passed along the idea to Mayfield who organized the first complete census of singing KW males in 1951 (8). This notable effort was repeated twice at 10-year intervals. In 1961, census results suggested a stable population, but the 1971 results showed a population in a steep decline (Fig. 1). With such valuable population trend information, knowledge of the bird's imperiled status was confirmed. Equally important, the census work began to build new partnerships among private citizens, Audubon groups, and government agency personnel who participated in and supported the effort. Such relationships would be necessary for the warbler management work to come.

Figure 1. Kirtland's Warblers singing male census results, 1951-2011.



In a letter to VanTyne in 1955, Mayfield suggested the concept of a state land "set-aside" for the KW. Refuges to protect game species were common in Michigan but unheard of for a songbird. VanTyne's response was somewhat hesitant and prompted Mayfield to clarify his thoughts, adding that such an area would be a place to study and observe the bird. Mayfield also promoted this idea through Fenn Holden, another ardent naturalist, warbler devotee, and member of the Grayling Game Club. At a social event (possibly in Lovells) in the spring of 1956, Holden suggested the idea to George Griffith, a Grayling resident and member of the then Michigan Conservation Commission, the decision making body of the Department of Conservation. Griffith encouraged Holden to either present in person or submit in writing, the proposal for consideration at the July 1956 Commission meeting. Holden passed along the invitation to Mayfield who wrote a moving letter in support of the KW and value of the preserve. Griffith's presentation, as recorded at the Commission meeting, was not as eloquent as Mayfield's letter but the proposal to dedicate state land for a KW preserve passed without comment (9). Holden would eventually be responsible for investigating early field records, determining the location of the first KW nest and helping promote establishment of a monument on the site.

The responsibility of setting up the KW preserve first fell to the Department of Conservation's Forestry Division. The Division Chief, G. S. McIntire, wrote to Mayfield regarding the favorable Commission decision, emphasizing the "… objective of our state forest program is not merely to produce wood, but to provide increased beneficial use of any kind to society… Such species as Kirtland's Warbler and the human interest and use that this bird stimulates justifies a definite place in our plans and program." (10) It appeared that soon after this letter was sent, Game Division was involved and eventually became the primary contact for this endeavor. Don Douglass, whose position in the Division was comparable to Assistant Chief and whom Mayfield would describe as a friend of the warbler, suggested to the MAS that they form a committee to advise the Commission on the practical details for the KW management area. Under the direction of MAS, the Kirtland's Warbler Preserve Committee (KWPC), a small group with knowledge of warbler nesting areas, was soon formed. In November 1956, Game Division Chief Harry Ruhl weighed in by suggesting some specific state land in Crawford and Kalkaska Counties, off Fletcher Road. He thought KW management might enhance the area for Sharp-tailed Grouse (*Tympanuchus phasianellus*) as well. Suffice to say, the top field leadership in the state natural resource agency at this time took a serious interest in warbler management and were cooperating with the individuals who had the most warbler expertise.

A Home and a Guardian

The commitment to dedicate state land for the KW and the establishment of the advisory team to help with management details began to shape what would become the KW recovery efforts. The first task of the KWPC was to select the size and location for the dedicated lands. Mayfield, who was chairman, specifically requested input on these items from committee member and State Conservation Officer Vern Dockham from Mio. Officer Dockham had taken a personal interest in the warbler, was highly respected by Mayfield, and his job gave him access to known warbler nesting areas at the time. He was asked to recommend several areas for field review by others on the committee. The request for his input, however, met some resistance from Dockham's supervisor as the November deer hunting season was at hand and Dockham planned to retire at the end of the year. He suggested a few areas for the committee's consideration and offered advice on habitat management, but more importantly, in December 1956 Dockham recommended the committee seek help of Game Division District Supervisor in Mio, John Byelich. This proved to be very fortunate for the committee's efforts as Byelich had been coached on warbler habitat by Dockham and was more than up to the task. Larry Ryel, a Wildlife Field Biologist

on Byelich's staff, was keenly interested as well. By 1957, three KW management areas totaling 7680 acres were formally established on state land. By 1958, the state under the guidance of Forestry Division had begun planting several thousand Jack Pine seedlings (along with a few other conifer species) on two of the areas.

Areas of public land managed by the USFS were also important to KW recovery. Interest in warbler habitat management by the USFS was not quite as direct as the State effort but the agency wrote to Mayfield in July 1960 requesting help in setting up a KW area near Mack Lake in Oscoda County. About a year later, a USFS representative voiced concerns about a "single-use or restricted-use area", suggesting this designation would not allow enough management flexibility. Mayfield persisted, however, and with the support of the KWPC and a straight-forward resolution from the American Ornithological Union (AOU) urging a preserve be set up to benefit this endangered species, the USFS established a 4010 acre tract of national forest land as a Kirtland's Warbler Management Area (KWMA) in 1962. The agency then prepared a management plan with the objective of maintaining at least 640 acres of suitable KW habitat using Jack Pine cutting cycles of 5-year intervals and controlled burning. Soon both agencies responsible for public land management began working together to better understand how to manage the land to benefit a songbird, and this distinctive effort was commemorated at a KW Sanctuary Dedication in 1963. Ira Gabrielson, then president of the Wildlife Management Institute, spoke with praise for the effort and an intuitive knowledge of endangered species management. He remarked an ideal approach was taken in that first, there was a careful search for facts and then with imagination and courage, those facts were used to develop a sound program. In two publications that year, Mayfield added to the significance of the dedicated management areas, writing that the future of the KW had not been left to chance occurrence of fire or changing forest management practices, and that by actual participating in management, public agencies had taken an interest in the KW(11). He tied things together when he recognized the need for public involvement, writing that these areas "… will make a larger segment of the human population aware of these charming birds and if further measures are needed, there will be a public whose sentiment can be mobilized intelligently to the cause." (12)

Byelich and his local colleague from the USFS, Bob Radtke, summarized the management activities of their respective agencies in a 1963 article and it showcased the core of KW habitat management philosophy (13). They stated the primary objective was to maintain the dedicated areas continuously in order to provide habitat requirements for the KW and to coordinate wildlife objectives with timber production, watershed protection, and recreation. The areas were not to be preserves but rather, management areas. Jack Pine was to be managed for sustained yield with commercial harvest making the program economically feasible. Blocks at least 80 acres in size were to be treated. The use of prescribed fire to regenerate Jack Pine in larger blocks was planned on USFS land. Planting configurations on state land were designed to "…duplicate conditions found in natural (Jack Pine) stands." Openings were planned in such pine plantations and were thought to benefit white-tailed deer (*Odocoileus virginianus*). Several other management considerations were mentioned. It was recommended oil and gas leasing be limited but hunting and other recreational activities not be restricted, though it was noted large groups and photographers during KW nesting time were concerns. At the time, there were no definite plans for cowbird control. Several suggestions were offered as to how other interests, such as the Michigan Natural Areas Council (which had already signed a cooperative agreement with the USFS) or Audubon groups might be of continued assistance. Though the authors felt the warbler population was not threatened in 1963, both agencies hoped the management efforts would provide some measure of assurance the KW would not disappear.

The KWPC fulfilled its purpose by helping to establish the dedicated management areas, but it appeared advice for managing these landscapes actually fell to government

agency personnel. This committee was apparently disbanded, perhaps after the 1963 dedication ceremony mentioned earlier. The foundation for a successful recovery program, however, was being built; the program's future rested upon the acknowledgement of the people who had accumulated the wealth of life history information, and intra-agency support and interagency cooperation. The component of public awareness for the KW was limited, but a growing interest in a healthy environment was taking shape across the country and became an opportune time to promote endangered species like the KW. This movement led to the celebration of the first Earth Day in 1970, and in Michigan, helped elect William Milliken as governor from 1969 to 1980, a strong and influential voice for environmental causes (Dempsey 2001). Sylvia Taylor, the MDNR's Endangered Species Program Coordinator in the late 1970's, felt Governor Milliken's administration was a key factor in the program's early success (14).

Mayfield continued to promote warbler needs. In February1964, he sent a brief letter to six university professors in Michigan asking if any were interested in research on cowbird control. Mayfield had learned that the USFS was interested in this endeavor in order to evaluate their management activities, but the agency was not willing to fund or assign someone to the task. Among the professors solicited was Dr. Nicholas Cuthbert with the Biology Department of Central Michigan University (CMU). By May 1964, Cuthbert had an agreement with the USFS to use some funding provided by the Audubon groups to start the cowbird research in June. For the next several years, Cuthbert experimented with shooting and trapping cowbirds in some KW nesting areas and concluded that a trap designed by the USFWS was most efficient. His KW population analyses, information from Walkinshaw's and his own nesting studies on cowbird predation, and the precipitous decline in the warbler population discovered in 1971, led to a fully engaged cowbird control program in 1972. It included a cooperative agreement, much of which is still in place, for the MDNR to build the traps, MAS to provide funding for some of the building materials and bait used in the traps, and the USFS and USFWS to operate the trap lines between May 1 and July 15 (15). A long-time KWRT member representing the USFWS complimented Cuthbert with the simple statement, "He saved us a lot of time." (16)

Advisory to Recovery

The results of the 1971 KW census, showing a 60% decline in population, led to the revival of another advisory group. In Oct 1971, a meeting called jointly by the MDNR and the USFS was held and 26 people attended, including representatives from Audubon groups, The Nature Conservancy (TNC), Michigan Natural Areas Council, universities, and others. The impetus for this meeting came from the USFWS, as Earl Baysinger from the agency's Office of Endangered Species was also in attendance. He gave a brief presentation, requesting a plan be designed to do something about the KW's situation and a local committee be formed with which the federal office could communicate. Consequently, the group passed a motion to approve in principle the proposals by Bruce Radabaugh (Pontiac Audubon Club) and Dr. Robert Storer (University of Michigan) for action in KW management and research "… as a demonstration of concern over the KW and a determination for action to preserve it." The action items were 1) extend the cowbird control program to all major nesting areas on public land; 2) attempt to limit all birding visitors to one area; 3) conduct more frequent censuses; and, 4) continue research, particularly on specific habitat requirements, warbler food studies, and problems in Jack Pine regeneration (17). From the larger group of participants, an ad hoc committee was formed to establish task priorities. Mayfield was chosen to chair the committee that included Byelich, Bill Irvine from the USFS who had replaced Radtke, Radabaugh, Storer, and Dr. William Thompson from Wayne State University representing MAS.

The group met the following month (November 1971), decided on the name KW Advisory Committee (KWAC) and on an affiliation with MAS. Costs and logistics of cowbird trapping dominated the conversation and the group extended a membership invitation to Bill Shake from the Lansing USFWS office, a biologist who had been involved in cowbird trapping earlier that year. Censuses were planned for 1972 and 1973. The MDNR and USFS were asked to keep the committee informed of habitat improvement activities. For its part, the committee agreed not to interfere with agency decisions, only to consult. KW habitat expansion was a priority for the committee. Byelich agreed to contact the MNG about their activities in KW nesting habitat. Enforcement of visitor restrictions was deemed impossible at the time but limiting photographers by offering to sell warbler pictures was encouraged. A pamphlet with KW information for visitors was suggested. The Pontiac Audubon Club had pledged funds to send Radabaugh to the Bahamas to become personally acquainted with the wintering grounds.

The establishment of the KWAC and its pursuit of the proposed action items were what the USFWS representative Baysinger had requested in October. The committee would eventually become known as a steering committee, nested within a larger group made up of MAS members (and perhaps others) retaining the advisory title. The steering committee met twice a year until 1975 when a formal KWRT was named. Mayfield kept the MAS KWAC informed of management activities and helped funnel Audubon money for miscellaneous warbler projects to the agencies. By 1977, however, the Audubon groups began to question the significance of their involvement. Mayfield responded that although things were "…in a familiar pathway with some steps repeated…" MAS should continue to participate in whatever way they could (18). As a member of the KWRT, Mayfield maintained this encouragement, considering himself the "civilian" member of the team and a bridge to the wider range of KW interests.

The federal Endangered Species Act was passed in December 1973 and had been lobbied for by the State of Michigan primarily for KW concerns. The law strengthened protections for imperiled species and their habitats. The KW was already listed as endangered under federal legislation of 1966, but the newer federal law added regulatory protection and called for recovery actions. In 1974, the State of Michigan enacted a law (Act 203, ESA 1974) to protect and conserve endangered and threatened species in the state making the MDNR responsible for carrying out scientific investigations and authorizing a full range of conservation programs including land acquisition. The KW was also included on the state endangered species list along with a host of other birds, plants, fish, mollusks, and others.

By January 1975, the formal KWRT was in place and held its first meeting. The USFWS Regional Director had been responsible for making all appointments to the team, deciding on the mix of representation, and designating the team leader. The team consisted of on-the-ground professionals who carried the greatest responsibility and expertise with respect to the species. From the USFWS, team membership was assigned to Bill Shake with local cowbird control experience and Wes Jones, Regional Supervisor from Fort Snelling, MN, a new face to KW management, but one with a background in animal damage control and a connection to Wisconsin. The USFS recommended Bill Irvine and Bob Radtke, considering them well-informed and able to effectively lead and represent the agency. Both had intimate knowledge of the internal workings of warbler management. The MDNR recommended Byelich, now the State's first State Endangered Species Coordinator, and Nels Johnson, Northern Lower Peninsula Regional Wildlife Biologist and supervisor of staff working in KW range. Due to his wealth of knowledge, respect, and recognized standing within the KW birding community, Harold Mayfield was appointed to complete the original team. Byelich was given leadership of the group, but there is no archived record of the reason for this decision. It is possible the MDNR Director, Gene Gazlay, lobbied for this appointment to ensure the

recovery plan was prepared in Michigan and that it would result in an approach with which the state could live. Regardless, Byelich had years of experience with KW management, was considered an ecologist by his peers, and according to Wildlife Division Chief Merrill Petoskey, Byelich had asked to be on the team (personal communication M. L. Petoskey 2011). It was, however, the first time Mayfield, the highly recognized "civilian" authority, had not been selected for the leadership role in the KW program, a notable shift of influence to government land management agencies.

The first KWRT membership changed very little from 1975 to 1990. Six of the seven original members including the team leader served the entire time. Dr. Paul Aird, a forestry professor at the University of Toronto, joined the team as an associate member in September 1978, representing Ontario, Canada. Aird still attends meetings. In February 1980, Bill Mahalak, MDNR Silviculturalist, was appointed to the team and served until his retirement in 1997. At the time of this appointment, the USFWS wanted a representative from Wisconsin on the team, but there was influence exerted by Michigan for a state forester to be added in order to coincide with the rollout of the habitat plan. Byelich explained this recommendation in 1981, remarking that Forestry Division was responsible for state land management and the team should have someone to represent that interest. Shake, one of the USFWS representatives, left the team in late 1975 and his position was filled by two other USFWS employees (Jim Mattsson and Dick Winters) between 1976 and 1984. Mike DeCapita, also with USFWS, was then appointed to the team and remained until his retirement in 2008.

By 1990, five of the now eight team members were retired and the USFWS decided to replace this group with current agency employees and to add professional research experience. The archive record shows that Mayfield and Irvine resigned, and Byelich, Johnson, and Jones were replaced. Mahalak, DeCapita, and Radtke were retained with Radtke appointed as team leader. It appears that he never acted in this position, however, as he did not attend any team meetings that year and may have retired from the USFS in 1991. Rex Ennis, (USFS) joined the team in 1990, possibly in anticipation of Radtke's departure. He was appointed team leader in 1991, serving in that role until he left Michigan in 2006. The USFWS retained the agency mix with the new appointments (3 MDNR, 2 USFS, 2 USFWS) but did not fill the Mayfield "civilian" role, opting to add two positions for Research Biologists at the time. Today, this structure remains nearly the same with the distinctive additions of representatives from The Bahamas National Trust, Canadian Wildlife Services, and Chequamegon-Nicolet NF in Wisconsin, bringing the total number of team members to 11. One research slot is filled by Dr. Carol Bocetti with the California University of Pennsylvania, appointed to the team in 1998 and team leader since 2006. Her appointment completes a circle of leadership for the KWRT, as both state and federal land managing agencies and now research have all been recognized. A consistent policy of replacing the core team members with current employees has been followed since 1990. In all, 41 individuals have been involved with the KWRT over its 36 year history (Appendix B).

The Recovery Plan

The principal responsibility for the original KWRT was to prepare and coordinate the implementation of a recovery plan that justified, delineated, and scheduled recovery actions. General planning guidelines were provided by the USFWS stating the ultimate goal was to provide a means by which a single, concentrated effort would lead to the removal of the KW from the endangered species list. The guidelines emphasized the team's role as one of coordination as opposed to directing recovery plan implementation. Teams were cautioned to address only biological considerations "… and leave political, sociological, economic, acquisition and media relation concerns to the Federal and State participating agencies." (19). A plan format was suggested recognizing the need for flexibility but allowing for continuity. It was highly recommended that communications "…flow freely between recovery

teams and any party with whom there is a need to communicate". To avoid misunderstanding, teams were to welcome participation from conservation organizations or interested citizens. For implementation purposes, the recovery plan was to culminate in a "job list" assigned to the cooperating agencies including such things as purchase land, close roads or continue management operations. Byelich referred to the plan and the team as "vehicles" to accomplish objectives.

Specific writing assignments for the KW recovery plan were made by team leader Byelich, and were straightforward given the expertise on the team. Shake and Jones were assigned cowbird control. Johnson and Irvine (with help from Radtke) dealt with the breeding range. Census planning originally fell to Mayfield but was soon given to Ryel, not on the team but now a MDNR Biometrician in Lansing who would coordinate the census in 1975. Radtke, Jones, and Mayfield were responsible for winter range concerns. Protection from disturbance was assigned to Irvine and Shake. A step-down planning approach recommended to Byelich at a USFWS training meeting was used as the writing format. The section authors were to include research as a step in each of the assigned management responsibilities.

By October 1975, team meeting minutes indicate that most of the narrative and management steps for the recovery plan were complete, enabling the team to meet a February 1976 deadline. According to the two original team members interviewed for the archive (Irvine and Johnson), the team was not in full agreement of the breeding range as the principal factor limiting KW population growth, but the team as a whole was committed to the goal of recovery. The recovery plan included 5 objectives 1) maintain and develop suitable nesting habitat, 2) protect the KW on wintering grounds and on the migration corridor, 3) reduce factors affecting the bird's survival (control human activity and remove cowbirds), 4) monitor the breeding population, and, 5) reintroduce birds into the Upper Peninsula of Michigan or other states. Relative to the other familiar objectives, reintroduction was a completely new topic of warbler recovery and was proposed by Wes Jones. There was a brief discussion of egg collection for the purpose of propagation; Shake prepared the step-down strategy. Mayfield added a somewhat dismissive interpretation for consideration of this objective in the recovery plan in a response to his Wisconsin friends, Fred and Fran Hamerstrom, who had heard the warbler might be introduced in that state. Mayfield wrote in June 1976, "I would not take very seriously – at the moment, at least – the suggestion that Kirtland's warblers might be introduced into Wisconsin. Here is how the idea gets into the 'Recovery Plan'. We on the Recovery Team are under the impression that in order to benefit from possible future funding, it is important to get every imaginable action into the 'Plan', or at some time in the future we might be denied government support. So, while we are at it, we put everything we can think of in the report. This proposal is just a gleam in someone's eye." (20)

The primary objective of the plan was "to reestablish a wild self-sustaining population of Kirtland's Warblers throughout its known former range of a minimum level of 1000 pairs." How the Team arrived at that goal is not very clear. It is simply mentioned in the April 1975 minutes and again in October the same year. In an interview in 1981, however, Byelich explained the population goal was set at twice the 1961 estimate of 500 pairs so if there was a 50% population decline as had been experienced in 1971, "…we've got time to recover; we've got something to come back from." (21) The development of recommendations for the amount of land to designate for management of the KW is also unclear. The recorded discussion about the essential nesting habitat and goals for habitat management was more lengthy, but rather confusing and did not include the specific figure of 135,000 acres given in the recovery plan. It is believed there was a great deal of discussion on this issue, however, especially relating to Red Pine (*Pinus resinosa*) stands on USFS land. Byelich in particular felt these sites should have been considered for KW habitat and by inclusion, would have increased the total dedicated acreage. The population and habitat goals were linked in a

February 1976 note from Byelich to Mayfield that reads, “After the field people completed the [habitat] survey for the Kirtland’s warbler, both active and potential areas, they came up with a total of 135,000 acres. This is the total acres found on state and federal forests. There are a few more acres on private lands but I doubt if it amounts to more than a small fraction of the total. If the search for Kirtland’s warbler habitat is anywhere near complete, and I feel it is, then it appears that the total warbler population never was very large. If all the 135,000 acres … was in production at one time, it would support about 4000 pairs. I doubt if all these … acres were ever in production at one time. It is my guess that about 2000 pairs would approach the maximum number ever produced. So, our goal of 1000 pairs is probably as much as we can expect to maintain on a sustained basis.” (22)

The Recovery Plan was submitted on time and given favorable reviews by a variety of agency representatives, including the Director of the USFWS, who required some changes to the document but concluded, “In perspective, this plan is one of the best received to date.” Other reviewers offered thoughtful points of view on several topics the team addressed succinctly and with confidence. When asked the purpose of maintaining Jack Pine stands past 21 years-of-age (oldest age of expected occupancy), the team responded that commercial timber harvest is the most feasible and realistic approach to reaching our habitat goals. When asked to explain the rationale for the proposed method of reintroduction, the team stated the method had been established for other species. When asked why the plan advocated certain forest management options (e.g. cut and burn followed by seeding) prior to establishing a firm scientific basis for their use, the team was quite clear there was a need to do what they could now and added, “…the best information in the world is not going to help us after the birds are gone.” (23) There were, however, several suggestions by the reviewers that were included and the document thus improved. When asked what should have been included in the first plan, people interviewed for the archive offered only a few suggestions, such as considering increased size of cuts, emphasizing the importance of habitat connectivity, adding a public relations dimension, and widening the focus outside of Michigan. All also noted that they have the benefit of 35 years of research and experience with plan implementation so, the habitat concerns reflect knowledge of KW biology not appreciated at the time the plan was written. Public relations efforts were not the responsibility of the Recovery Team but were strongly supported. Concern for birds outside of Michigan, during migration, in wintering areas and in the eventual expanded breeding range, would be given emphasis by subsequent teams. The 1976 Recovery Plan was very thorough and while an update in1985 made the plan more current, it did not change the main objectives. The most significant modification to the original plan came in late 2001, when members of the KWRT developed a white paper (24) explaining the need to clarify the primary recovery objective using the best available science. This was a momentous step and eventually led to a new model of KW management cooperation to be discussed later in more detail.

The Habitat Management Plan

A companion to the original KW Recovery Plan was the Habitat Management Plan developed by Phil Schempf and Bill Jarvis (USFS) and Mike Mang (MDNR). Though some KW habitat work was on-going, Byelich, as team leader and consummate field man, strongly pushed for the completion of this document in order to accelerate and track habitat management activities. The joint effort was completed in 1980, reviewed by agency staff, and endorsed and signed by MDNR Director Howard Tanner and Huron-Manistee NF Supervisor Wayne Mann in March 1981. General information, maps, and guidelines that coordinated timber resources with the known nesting requirements of the KW, were provided to field staff. A total of 23 KW management units on state and federal land were defined. Each unit had treatment blocks scheduled on a commercial rotation for Jack Pine to provide a sustained, even flow of suitable nesting habitat for the future.

The habitat plan was followed for several years but could not keep pace with the dynamics of a changing landscape and additional information from several research studies. Private lands were purchased by the USFWS located within several management units under state ownership. A new KW management unit was defined on state land after settling some differences with the MNG at Camp Grayling. Wildfires expected to naturally regenerate Jack Pine altered the somewhat rigid habitat development schedule, especially for the USFS. Jack Pine plantations on state land that failed to survive due to drought had to be re-planted, challenging annual fund allotments and setting back regeneration plans for newly harvested areas. Revisions to the plans for the Huron-Manistee NF and the Hiawatha NF in the UP increased the amount of acreage dedicated to the KW. Research suggested some of the original concepts built into the 1981 plan should be changed. In particular, larger cutting blocks (>320 acres) were recommended as they extended the duration of warbler use. These and other considerations, such as improved GIS technology, prompted several updates of the KW habitat development strategy. During his tenure as the KWRT leader, Rex Ennis was especially instrumental in guiding these updates through to completion which as his predecessor Byelich had done, continued to underscore the importance of habitat work for the KW.

Discussion of habitat issues took place at every KWRT meeting. Annual presentations of the habitat development reports by the agencies were given and served to reinforce the cooperative nature of the recovery program and allowed the team to gauge progress toward habitat goals. More specific topics, such as compromises made to the opposing wave pattern used in plantations or habitat closures, were lively and did not always end in consensus. Legislative action, such as House Resolution 241 of May 1991 that took issue with KW management in Crawford County and threatened to end all cutting for warblers and the more recent decision in 2010 by MDNR to not use Deer Range Improvement Program funds for Jack Pine plantings reminded the team that support for the recovery program can be tenuous. Questions asked on how well the KW habitat strategy mimics natural disturbance regimes, or if the overall habitat management philosophy is focused only on the KW, are relevant and timely. Such critical review of KW habitat management has helped the KWRT learn, adapt, and pay more attention to details. Thus, over time, more managers are defending large Jack Pine clear-cuts, promoting retention of super canopy pine, adopting no-salvage practices in wildfire areas, looking at options for the opposing wave planting pattern, and beginning to talk about prescribed burns in fully stocked Jack Pine stands.

Managing Fire

KW nesting habitat was described by Mayfield as extensive forest stands dominated by young Jack Pine (6-20 years old) and interspersed with generous openings (6). As the species nests on the ground, he felt low-growing shrubs and grass, fairly thick in places, was an important habitat component. He understood wildfire was the natural disturbance factor producing these conditions and fire "…may be needed periodically to restore proper conditions in the ground cover." (11). When public land was dedicated for KW habitat and interest in active management grew, adding controlled fire to the Jack Pine landscape seemed a logical management option. The use of prescribed burns for wildlife was not a new concept in Michigan and had been practiced on thousands of acres of grass and shrub land by Game Division, Department of Conservation, to primarily benefit Sharp-tailed Grouse and Greater Prairie Chicken (*T.cupido*) (25). In May 1964, the USFS staff in Mio prepared to burn a 500 acre tract of cut-over Jack Pine where tops and cutting residue had been scattered. Some 10-15 trees were left for a seed source to regenerate the stand. (The seed-bearing cones of Jack Pine open when exposed to an environmental trigger, in this case fire, rather than at maturity, an ecological adaptation known as serotiny.) Public interest in the effort was expected to be high and prominent journalists were notified. Les Line, a strong advocate for the KW and

award-winning Michigan writer, wrote about “Project Pop Cone” (26). Dow Chemical Corporation, which provided a fire control agent named Gelgard M, justified the effort “…to prevent a crisis in birdland”. (27) The burn went off as planned and Radtke prepared a summary of the fire for his USFS superiors, complimenting the field staff on a job well done and commenting it was the first known prescribed burn to benefit the KW and other non-game species.

A formal review of the 1964 burn was done in1966, and it was felt that after the three growing seasons, the objectives had not been fully met. While there were some areas of dense regeneration, Jack Pine seedlings were spotty across most of the burned-over area. Several reasons for the partial failure included the dry summer following the burn, a lack of seeds released, and loss of seed to the fire. The then North Central Forest Experiment Station, a research arm of the USFS, proposed field methods to measure these variables, and with their expertise, a second burn was accomplished in October 1966. There appeared to be none of the fanfare for this work as had been given to the 1964 prescribed burn, and the archive does not include study results.

In 1974, the MDNR prepared an Environmental Impact Statement (EIS) for prescribed burning that included an objective relating to KW habitat improvement. The report articulated the importance of fire and its ecological role, suggesting the “… reduction in wildfire is perhaps the single most important environmental change in today’s forests…” and concluded additional efforts would be necessary to preserve our natural ecosystems, specifically mentioning Jack Pine. The MDNR planned to expand the prescribed burn program significantly to 12,000 acres per year, a portion of which would be for KW habitat (25). The KWRT clearly supported prescribed burning to meet habitat development objectives in the Recovery Plan, recommending its use after the commercial harvest of Jack Pine and to treat non-commercial stands.

In early May 1980, a routine burn was planned in a 200-acre cut-over Jack Pine slash area on USFS land south of Mio, a few miles west of a resort cabin development on Mack Lake in Oscoda County. The burn objective was to provide for the future growth of the plant associations favorable to the KW. After ignition, variable winds caused the blaze to jump the fire line and a major 2-lane highway, resulting in a wildfire that burned 24,790 acres of forest land and destroyed or damaged 41 buildings. One fire fighter lost his life. The Mack Lake Fire, as it was named, was an unfortunate management mistake undermining public support for the KW recovery program and the use of fire as a wildlife management technique. A reporter from the Bay City Times described a sign he saw in an Oscoda County restaurant, summing up much of the local sentiment with, “Roses are red; fires are hot. Because of this bird, our forest is shot.” (28). Margaret Gahagan, a locally recognized wildlife enthusiast, prolific writer and editor of the North Woods Call, strongly criticized the program and was quoted saying, “When they get through with the jack pine stands, all other wildlife leave… I’m getting sick of the warbler… when you think of all the money spent… sometimes they go crazy on management plans… this is a publicity job… which the Audubon Society picked up.” (29) She did offer a compromise in that she felt management for the warbler should continue, but not at the present scale, and that did indeed happen in some ways. The USFS suspended all prescribed burning until the Huron NF could meet new training requirements and equipment standards. The MDNR might not have had a formal ban on the practice, but field people were respectfully cautious and offered few proposals for burns. At least one researcher felt it was imperative to devise alternatives to KW habitat development due to the risk associated with fire (30).

The KWRT heard a review of the fire events at the July 1980 meeting and was urged to comment on the Prescribed Burn Fire Analysis Report (31). The discussion that followed involved the prioritizing of KW areas into categories of cover defining the type of burn needed. The advantages of this approach were to maximize the few ideal burning days available and

plan timber sale specifications to best prepare for prescribed burns, or not. Clearly, the Team continued to defend fire as a management tool. This was emphasized again at the next meeting in February 1981, when discussing a soon to be published article about the KW. Radtke was disappointed with the piece and asked Byelich to write to the magazine editor, requesting the role of prescribed fire be strengthened in the article. There is no evidence in the archive a letter was sent or comments on the fire analysis report were formalized, but such meetings allowed for discussion and definition of the issues by the KWRT in the presence of land managers for whom the message was intended.

The Mack Lake Fire had a profound influence on KW recovery efforts in many ways beyond the constraints placed on the use of prescribed burning. Directly, about 250 acres out of about 750 acres of occupied habitat were burned, resulting in a drop from 27 singing males in 1979 to 15 males in 1980. (It was felt the "missing" birds moved to other areas.) More significantly, the potential KW habitat that could be created by the fire was estimated at 10,000 acres by 1990, and the amount of this new habitat would be greater than that existing at the time of the fire. In 1986, the first warblers (14 birds) were found in the burn area and this represented about 7% of the singing male count that year (210 birds) (Fig. 1). By 1992, 250 warblers were counted in the burn, representing 63% of the total (397 birds). This prompted concerns of "too many warblers in one basket". In 1994, the burn area count peaked at 300 singing males but the proportion of the total annual count (633 birds) fell to 47%, suggesting birds born in this area were beginning to populate other habitat, mostly Jack Pine plantations. It is generally accepted the Mack Lake Fire accelerated KW recovery.

Research "… to establish a framework of landscape ecosystems for the Mack Lake burn as a basis for understanding warbler occurrence and behavior…" was begun about 1984 by Dr. Burt Barnes with the University of Michigan. Results would show a pattern of Jack Pine regeneration and microclimate differences could predict patterns of warbler occupancy (32) and a broad scale ecosystem approach would be useful in understanding the KW distribution across the landscape, especially when large areas were crucial to population recovery (33). This concept would broaden the conversation about warbler habitat and slowly influence a Jack Pine ecosystem management strategy.

Resource managers interviewed for the archive who were employed at the time of the Mack Lake Fire considered the unfortunate incident the low point in their history of recovery efforts. A troubling reminder of the fire was brought to the public's attention recently in a National Public Radio (NPR) program (34) with the emotional interview of the family of the fire fighter who had lost his life. Thirty-five years earlier, another NPR program offered some consolation. The radio host, George Bushnell, reminded those involved with endangered species recovery that value judgments must be made and well thought out with any foreseeable consequences identified. Decisions must be made and the results accepted, and if this were done, "… the Kirtland's warbler may have taught us more than simply how to survive." (35)

Research Contributions

A frequent topic of discussion at KWRT meetings was research and early on, the restrictions that would be placed on research activities. A cautious approach was first suggested in 1964, when Radabaugh requested permission for a state permit to color-band KW in the Mack Lake area. The Game Division responded it was "…desirable to have some control over banding activities and such, on these KW areas. We think it desirable also to impose some limitations on such projects-basing approval on whether or not they seem worth while, their scientific value, etc…" (36) In 1973, the KWAC seemed to have the same guarded attitude. While the group encouraged more research on such things as warbler habitat preferences, dietary needs, and the identification of limiting factors on the winter range, they discouraged "… any research that seems likely to cause harm to any individuals…" (37) The

following year, this group imposed further restrictions on field research – no more than 25 nests would be monitored, no young warblers would be banded, and the recapture of previously banded birds would be limited to 25 individuals. They did encourage a study by Storer using only field records to evaluate factors related to KW nesting success. His 1975 report gave rise to the recommendation in the Recovery Plan of 320 acres as the minimum stand size needed for successful nesting.

The new KWRT recommended a suspension of all research in 1975 and requested new ideas for study be reviewed by the team. Mayfield was not in support of research postponement and exposed his frustrations in a Jan 1976 letter to a colleague who had studied the effects of cowbird removal on the host species. Mayfield wrote, "Now, the removal of cowbird eggs from any significant number of Kirtland nests seems beyond our reach. The KWRT, of which I am the only… research-oriented member, through the cooperating government agencies has clamped down on 'molestation' of the Kirtland nests…" (38) Aird seemed to agree with Mayfield's implied characterization of the early team. In his archive interview, he succinctly remarked "…they were operators, not researchers." It is likely the friction between Mayfield and the rest of the KWRT over research activities continued throughout the entire time they served together. In 1989, Mayfield was asked to present his perspective on KW at a symposium in Lansing, MI. He concluded his lengthy remarks with, "…as we weigh the fate of the Kirtland's warbler at the crossroads-extinction or survival', I think it is clear that we have a greater need for ideas than for trees." (39)

Despite philosophical differences, the KWRT recognized the need to "chart the direction of research" and a standing committee for that purpose was established in 1981. The Research Committee would report to and work directly with the KWRT who would take the responsibility for defining problems in need of study. The committee would also review proposals from universities and other agencies and help the team select studies to pursue. Byelich asked Irvine to chair the committee and five other people volunteered to work with him. Resource people with expertise in habitat, Jack Pine silviculture, fire management, and winter biology were asked to serve as consultants. About 1987, the Research Committee was reassembled into a smaller group and today, performs the same function of new research study review as well as research coordination. In March 2012, the KWRT expanded the Committee's role to include facilitating the formulation of management-related research questions and improve responsiveness to funding opportunities.

As the warbler population grew, fewer restrictions were placed on field studies that directly involved handling the bird. Presentations and timely updates and final reports were requested of the researchers by the KWRT, and more often than not, the request was honored in person or by providing a written summary. In the archive, there are 102 scientific papers, theses, dissertations, books or book chapters listed published between 1975 and 2010, and this list is not at all complete. The titles suggest a progression of research needs and the development of new partnerships. A partial list includes:

- KW nesting and banding summaries
- Alternatives to cross-fostering
- Jack Pine regeneration experiments
- Landscape descriptions
- Evaluation of radio transmitter attachments
- Foraging ecology
- Development of reintroduction techniques
- Models of KW habitat suitability
- Density, demography, and mating success in different habitats
- Public support for endangered species recovery
- Winter habitat of the KW

- Diet analysis
- Effects of jack pine plantations on barrens flora
- Fire and shade effects on ground cover structure
- Characterization of historical and modern fire regimes
- Habitat distribution of birds wintering in Central Andros, the Bahamas
- Micro-satellite DNA markers
- Comparing census methods
- First annual census of KW in Wisconsin
- KW habitat management and multi-species bird conservation
- Patch dynamics and the timing of colonization-abandonment events
- KW in early successional habitats on Eleuthera, the Bahamas

The North Central Research Station (formerly North Central Forest Experiment Station) had the longest relationship with the KWRT through Dr. John Probst, one of the unit's employees. About 1978, he undertook a 3-5 year study of various aspects of KW habitat, beginning with an analysis of the differences between burned and unburned areas. This study and many more were supported by the Station for over 30 years and Probst contributed much to the understanding of KW habitat management, in particular the relevance of tree density and stand size to warbler occupancy. He was appointed to the KWRT in 1990 to fill one of the two new research positions and served until his retirement in 2009.

Kirtland's Warblers and the National Guard

The KWRT's first response to research was cautious and controlling because of the importance they placed on protecting the bird. For the same reason, the team's relationship with the MNG at Camp Grayling was stormy and almost defiant. Camp Grayling was established in 1913 with a 15,000 acre gift of land from Rasmus Hanson for the purpose of military training. More land was eventually acquired with Military Board funds, transferred from state ownership or leased from the state. Camp Grayling is now about 147,000 acres in size, most of it located in Crawford County. The MDNR manages the surface resources but military use supersedes other interests. Portions of the camp have Jack Pine forests and wildfires often resulting from military maneuvers are not uncommon. One such fire burned about 2300 acres on the Camp in central Crawford County in August 1955, and the resulting Jack Pine regeneration became KW habitat. Fenn Holden found the first birds in the burn in 1961, and he continued to monitor the area for the next several years. On the morning of June 18, 1964, at the height of the nesting season Holden happened to be in the area observing the birds "… when there arrived a squad of huge tanks and other vehicles manned by the Indiana National Guard. I [Holden] could only watch in helpless agony as they deployed into the very heart of the nesting colony. The captain in charge assured me that he could do nothing about it…" (40) The news of the habitat disturbance generated much correspondence with several interested parties, possibly none more important than Bill Freeman, a member of MAS. In a letter to Mayfield, Freeman explained he had contacted the Adjutant General of the MNG, "a close personal friend", and, as a result, a meeting had been arranged with representatives from the Department of Conservation, MNG, and Holden. It was decided that "… the Guard would refrain from directing any maneuvers in the nesting area during the period from May 1 through July 15 for a period of 5 years. Also any subsequent areas that may develop would be subject to like action." Freeman added that the Military had been somewhat chagrined about the episode, very cooperative, and all who met were satisfied with the decision (41).

In April 1975, a MNG representative met with the newly appointed KWRT, expressing concerns over the safety of cowbird trappers on Camp Grayling. That issue was easily

resolved with promises to keep the Military and trappers in contact with each other. The next question from the Guard related to a possible extension of the closure date from July 15 to August 15. The response from the Team was succinct. They recommended the extension and will contact the appropriate individual from the MNG to renegotiate the closure date. Soon after, the MDNR and Governor Milliken supported the team's position (42). In June, it was learned the Indiana National Guard might cancel their training plans at Camp Grayling due to the restrictions, and a Detroit Free Press article at the time reported that a "…rare little Michigan bird has stymied the Michigan National guard and ruffled the feathers of Grayling businessmen." (43) This article featured the infamous editorial cartoon showing a bird on the muzzle of a tank gun shouting "About Face". This may have led to the lesser known military acronym for the warbler of "FLAW", flying lightweight anti-tank weapon (44). In July, the MDNR and the MDMA announced a compromise that reduced the acreage affected by the closure order, but it appeared tension was building between the MNG and the team.

In a January 1976 letter, the Military objected to a buffer around nesting areas proposed by the KWRT, saying it would effectively eliminate the tank training range. In order to work out this situation, two people from the MNG were to be assigned to work with the KWRT on a habitat plan that would attract KW elsewhere, moving the birds out of the tank range. There does not appear to be a response from the team to this suggestion in the archive. After the warbler census in July, Byelich reported a 12% increase in the KW population and gave credit for the positive change to "…the 'battle' with the National Guard tanks which kept guardsmen from maneuvering in Kirtland's habitat until after Aug 15…" (45) In August, a 335-acre fire on Camp Grayling burned into habitat occupied by warblers. A newspaper editorial criticized the Guard's negligence and suggested such highly disruptive activities as tank runs and artillery shelling shift to another site (46). Though the Guard reported they could not ascertain the cause of the fire, they admitted conducting tank maneuvers in the area. This prompted a "concern alert" to be issued to the KWRT by the Regional Director of the USFWS. Essentially, this was a formal notification that MNG activities may have adverse impacts on critical habitat and they would be required to enter into a consultation process. This appeared to result in a stream of written communications about the legal interpretation of this process for several years and the archive is not clear on how it was resolved.

In March 1977, the MNG gave a presentation at the Natural Resources Commission meeting and offered to alter training schedules and make modifications to equipment that would reduce fire risk during training maneuvers. The Guard also suggested a fence be built by the MDNR around the nesting area. This discussion was misreported by the MDNR as Camp Grayling would not use the tank and helicopter range before August 15 (47). The Military attempted to correct the misunderstanding but not before at least one article reflecting on the MDNR report, commended the MNG for a change in attitude toward the warbler. The fence was not built but the nesting area was heavily posted with "No Entry" signs.

The confused and rocky relations persisted but communications improved when the MNG hired Greg Huntington as an environmental manger in 1983, to help with environmental law compliance. He worked with the KWRT as an ex-officio member until his retirement in 2010. A notable achievement was the development of a cooperative agreement between the MDNR and MDMA in 1985. Huntington is the first to credit Ray Perez, then a MDNR Wildlife Field Biologist in Grayling with several years of experience with KW habitat management, for working out the land exchange concept involving Military land near Stephan Bridge Road and the area known as the Bald Hill Fire. Most of these lands had a history of KW use or were presently occupied by warblers and, in essence, the agreement allowed the Military to eliminate the potential for warbler habitat in one area in exchange for the creation of a new, dedicated KWMA in another. The negotiations may have eased some tension as it appeared no one was too excited when a tank commander was cited by a MDNR Conservation Officer

for illegal entry into the posted warbler habitat that summer. The platoon leader openly admitted his mistake and paid a fine (48). The Cooperative Agreement was endorsed by the KWRT and signed in May 1986 by the Adjutant General of the MDMA and the Director of the MDNR.

Huntington and other environmental program staff helped on the KW census, developed a comprehensive pine barrens management strategy for a portion of Camp Grayling, and were involved with several other formal agreements, including an important amendment to the 1986 document that was eventually signed in 1997. The MNG had agreed to eliminate the natural development of potential KW habitat on land where military maneuvers resulted in wildfire, a costly management option. The amendment employed the concept of "safe harbor" in that warbler habitat would not be destroyed, rather the Military could continue to train in such areas until the birds were found and restrictions on further use would be at the discretion of the military. What was clearly reflected in Huntington's approach was the defusing of the "us versus them" concept, the practice of the fine art of compromise, and getting all parties to accept that long-term goals far outweigh short-term benefits.

Involving the Public

The KWRT's concern for disturbance to KW by field researchers or military maneuvers also extended to the general public. The earliest organized recovery efforts attempted to discourage nest photographers and in 1973, MAS sold sets of slides that were intended to satisfy this interest. In 1975, the KWRT recommended to the MDNR and the USFS to begin using existing regulations and land closure orders to prohibit entry into habitat and block trails, mostly during the nesting season. As Byelich explained in a public meeting in 1981, "… it seemed that we were constantly trying to resolve problems caused by people…" and he listed several activities that could have negative impacts on KW's such as berry picking, bird watching, photography, song recording, and motorcycling. His argument about this form of recreation were stated simply, "…motorcycles love these open plains… and they enjoy riding through these areas and it's fun, I suppose. But, also the warbler's in these areas." (49) In 1990, after much internal debate the KWRT recommended to extend the closure dates into September in areas of highest bird concentrations to protect young warblers. But as the KW population grew, and to avoid any unintended conflict with hunters, closure dates were relaxed and have remained consistent from May 1 to August 15.

Restricting public use in KW habitat may have protected the warbler but it did not address the need for educating the public about why the protection was necessary nor, in general, what the warbler was all about. To control the demand to see the rare bird and share information about it, guided tours have been provided by the USFWS and the USFS with the help of MAS, Detroit Audubon, and others since 1975. People from all over the US and several foreign countries have participated in the tours, contributing to a small but locally important eco-tourism business. The KWRT has helped develop informational pamphlets. Agency personnel have given many presentations to school groups, service organizations, and the like. The KW story has been told often in the popular press and continues to be featured, as in an article entitled "One Persnickety Bird" (50). When the Michigan Living Resources program was launched in 1975, it provided an opportunity for education and fund-raising by selling patches and posters of selected Michigan wildlife, fish, and flora. The first species chosen for the promotion was the KW and in August 1976, at a ceremony at KCC, Byelich accepted a check for $10,000 from the program to aid the warbler. That year, a very limited edition of a color photo of the warbler taken by Bob Harrington, the MDNR photographer, was released for sale. In 1993, the "Bird of Fire" rose, specifically developed by Tom Taylor to honor the KW, was introduced and sold as a truly unique fund-raising idea.

The most structured public relations campaign with which the KWRT has been involved began in 1991 when DJ Case and Associates presented a proposal to market the

KW. An information and education plan was developed recommending the formation of partnerships among governmental agencies, the business community, and local residents to communicate the ecological and economic value of the bird and its management and "… broaden the ownership of conservation objectives." (51) In 1994, Virgie Purchase and Holly Gomez, Mio business owners, with Bob Hess, MDNR District Wildlife Biologist, and many others successfully organized the first KW Festival in Mio. Several special events were held, including the inauguration of the self-directed Auto Tour that took visitors through a variety of forest communities, and a visit from US Secretary of the Interior, Bruce Babbitt. He explained his "Mio Model", a standard for the country that stressed the importance of shared responsibility between government and private interests in conserving biodiversity. The festival moved to KCC in 1996 under the able direction of Jim Enger, director of marketing for the college, and with the financial support of the college. In May 2011, the 18th annual KW Wildlife Festival, "A Celebration of Nature" was held with much the same enthusiasm as in the past but under the cloud of future funding shortages. The success of the festival has strengthened the partnerships among and with KCC, the KWRT, supporting government agencies, and the public, and remains an example of Babbitt's vision of the "Mio Model". The present challenge for public involvement with warbler recovery is to keep these relations strong and the overall program relevant as funding priorities change.

Kirtland's Warblers Everywhere

The above discussion is primarily focused on KW nesting habitat in the core range of central Northern Lower Michigan where today, a healthy warbler population is restored resulting in a dispersal of birds to the Upper Peninsula (UP) of Michigan, Ontario, and Wisconsin. In 1982, Probst reported a singing male in Marquette County in the UP, a first in the history of the species account. Subsequent searches over the years resulted in records of lone males until 1995 when the first KW nest was found in the Baraga Plains. More males, females and successful nests were found in the next several years, confirming the range expansion of the KW to the UP. Banding efforts were initiated by Bocetti and movement between the Upper and Lower Peninsulas was documented (52). Cowbird trapping was started but abandoned due to shortage of funds and trap vandalism. Questions on KW habitat management in the UP were discussed at Team meetings. Steve Sjogren, Wildlife Biologist on the Hiawatha NF, emphasized the value of a large scale management approach to promote KW with pine barrens and expansive temporal openings for species like Sharp-tailed Grouse (53). Sjogren's appointment to the RT in 2006 supported a leadership role for the Hiawatha NF in KW recovery outside of the core range.

A pair of adult KW and one fledgling were observed in Barrie, Ontario, in Aug 1945 (54) and this sighting is considered the first record of a breeding pair outside of Michigan. In 1977, Aird found a lone singing male on CFB Pettawawa that appeared to be maintaining a territory. Byelich and Walkinshaw visited the site with Aird that summer, banded the bird but never found a mate. Subsequent searches over the years in jack pine habitat detected other males with no evidence of females. In June 2006, CFB Pettawawa implemented a KW presence or absence survey and three lone males were found, one of which was banded by the observers. This bird was found again on the base in 2007 without a mate. However, while banding yet another male KW, a female with a brood patch was captured incidentally in the mist net. A nearby search uncovered the first KW nest in Ontario and it contained 2 unhatched eggs and 2 nestlings (55). The Canadians had prepared for the eventual nesting for several years. In 1977, shortly after the lone male was found, the Ontario government added the KW to the list of species protected under the province's Endangered Species Act (56). Aird joined the KWRT in 1978. A recovery plan for KW in Ontario was written and habitat inventories were conducted. In 2009, Ken Tuininga, Canadian Wildlife Services, was appointed to the Michigan KWRT.

A remarkably similar pattern of search and historic discovery was made in Wisconsin. Encouraged by Aird's report of a lone male on territory in 1977, the WDNR conducted a survey in late May and June 1978 to determine if KW were present in Wisconsin. Two lone males, one of which had been banded in Crawford County, Michigan, were found that year in Jackson County (57). In Sept 1978, the KWRT met in Black River Falls, WI, to discuss habitat management options, the possibility of reintroducing warblers to Wisconsin, and future monitoring efforts. An interest in looking for warblers was expressed but no other commitments were made at the time.

Survey work in Wisconsin was intermittent for several years and, as in Ontario, searches produced lonely males. Then, in May 2007, an avid birder working on private industrial forest land found three singing males and reported the sightings to the WDNR. Under their guidance, observations continued into June and three other males, females, and nests were discovered but no definite evidence of KW fledglings was reported. (58) By 2010, at least 24 males, 13 females, and 16 nesting attempts were recorded in Wisconsin and an active recovery program had begun. Cowbird trapping was initiated by US Department of Agriculture-Wildlife Services. Volunteers helped with the census, banded adults, monitored activities on the nesting area, and raised funds. Plum Creek Timber Co allowed access to the birds on their lands and supported outreach efforts (59). Dan Ecklund, Chequamegon-Nicolet NF, was recently appointed to the Recovery Team and has reported on habitat development activities on the forest.

The Winter Range

Though KW have expanded their core summer nesting range, the Bahamas remain as the known winter range. There was some formal cooperation with the Bahamian government and early researchers including Mayfield, Radabaugh, Mary Clench, Paul Sykes, and others. In 1970, the warbler was involved with a diplomatic gesture on the part of the State of Michigan that was extended to the Prime Minister of the Bahamas who was in the state giving a lecture. The official greeting included a presentation of a KW carving, Mayfield's KW book, and other materials. It was noted the Prime Minister was very appreciative of the gifts and he "…apparently recognized the bird and referred to it by a local dialect name." (60)

The most recent efforts by the KWRT to develop a cooperative relationship for KW conservation in the Bahamas began in 1996. David Lee with the North Carolina State Museum made contacts in the Bahamas through professional associations and became concerned about threats on the wintering range. Lee approached the KWRT for support and in the winter of 1997, two team members, DeCapita and Phil Huber, USFS Biologist, traveled to the Bahamas to examine habitat and discuss issues with the Bahamas Ministry of Agriculture and the Bahamas National Trust. With the indispensable assistance of Dave Ewert from The Nature Conservancy (TNC), four Bahamians were able to visit Michigan in June 1997. Another rapport-building trip to the Bahamas was made by KWRT members, Ewert, and Lee in February 1998. As a result of these efforts, Eric Carey of the Bahamian National Trust, was appointed to the KWRT in 2000. Carey, Ewert, and Dr. Joe Wunderle, USFS Biologist, developed a neotropical bird research proposal for the Bahamas. This study was initiated in 2001-2002 and included characterizing KW winter habitat, identifying and mapping areas for birds of conservation concern, and training Bahamians as field biologists to build the capacity to support local conservation efforts (61). Eight students have assisted with field studies during the winter in the Bahamas and participated in a summer internship with the Huron-Manistee NF that is organized by Huber, a personal recovery effort high point (62).

The Bahamas connection extended to the KW Festival and KCC when they helped host the student scientists and a Bahamian teacher. The "international flavor" spread to the annual calendar poster art contest sponsored by the Festival when Bahamian school children were asked to contribute original artwork for the promotional program. This resulted in

drawings of KW with beaches and palm trees, something not seen from previous entries by Michigan-only students. The connection also serves as a reminder that the KW spends more time in the Bahamas than in Michigan, a point of growing pride in the Bahamian archipelago (63).

A Work in Progress

The KW population goal of 1000 pairs was reached in 2001 but the Recovery Plan objective called for this population to be "self-sustaining". The KWRT and those associated with warbler management recognized early on the future of this bird will be a managed future (64), a truly self-sustaining population was not possible, and the need for intensive management would continue. In 2002, the team recommended to the USFWS Regional Director the primary KW recovery objective read, "… establish and sustain a KW population throughout its known range at a minimum level of 1000 pairs using adaptive management techniques." As further clarification, the team recommended that the warbler status be classified to *threatened* when population estimates are sustained at or above 1000 pairs for 5 years and to remove the species from the endangered species list when mechanisms were in place to assure continuity of habitat management. An interagency Memorandum of Understanding (MOU) was suggested and due to fiscal uncertainties faced by the cooperating agencies, a privately endowed trust fund recommended (65).

The KW population has exceeded the clarified goals since 2006 (Fig. 1) and the KWRT has asked for help from the USFWS on delisting and down-listing processes. A threats analysis was initiated in 2007 and submitted to USFWS Regional Office in 2011. To secure funding, an initiative with the National Fish and Wildlife Foundation (NFWF) was begun in 2007 to establish a new paradigm for endangered species management that supports a partnership to manage KW and the Jack Pine ecosystem independent of the federal status of the warbler. The conservation goal was to create a new model that addressed management needs after de-listing by increasing the active involvement of citizens and private organizations (66). Bocetti was very instrumental in organizing the partnership with NFWF and getting keystone designation for the KW. Christie Deloria, USFWS Biologist, led the development of the MOU (67) signed by the three cooperating agencies on May 21, 2011, at the KW Wildlife Festival at KCC, ushering in the start of a new era in KW conservation.

Summary

In a perspective on re-designing recovery teams, Westrum (1994) suggested four shortcomings that led to team failure: poor intentions, ignorance, incompetence, and bad luck. Poor intentions were defined as contrary or inadequate motivations of those in control. The collective KWRTs and their leadership were models of good intentions toward species recovery. Recommendations were based on what was best for the bird and outweighed personal interests. There were strong and confident personalities on and associated with the teams and such traits reinforced long-term commitment to the program.

Ignorance was defined as lacking knowledge. The early team had basic information about the bird's biology, a population trend, cowbird control techniques, habitat management experience, and knew that they had to do something to secure and restore the warbler population. Subsequent teams took advantage of new information and improved technology for science-based recovery recommendations.

Incompetence meant lack of skill. Clark (1997) reminds teams the skills required for species recovery are not simply those of the scientific technician. They include deliberation, problem solving, decision making, flexibility, competence, and the ability to carry out reflective conversations with oneself, clients and society. The KWRTs have had members who are skilled in science, land management, pest control, administration, and policy. They sought out expertise in public relations and outreach, collaborated with academia, and are working with

non-governmental organizations to think differently about the future. At least some interpersonal skills were used to "guide the passion and cool the anger" the warbler can evoke. The courage to innovate, be flexible, and learn new skills remains challenging.

Bad luck happens. If the Mack Lake Fire had been a true wildfire, it would still have been tragic from a human point of view and fortuitous for the warbler. A key decision-maker may think warbler recovery will create problems rather than a desired outcome. Another may consider recovery accomplished. There has been more "good luck" for the KW recovery program. The Jack Pine ecosystem preferred by the warbler was a "barrens" to early settlers and large tracts remained in the public domain. By the time the 1975 KWRT was formed, a legacy of consensus and interagency cooperation was well established (Solomon 1998). Major long-term resource investments in funds and personnel by cooperating agencies and several private entities have contributed significantly to program success.

It may have been unrealistic for the USFWS to expect the role of the KWRT to be one of "coordination as opposed to directing" recovery plan implementation, as early guidelines had suggested. When Byelich referred to the team as a "vehicle" to recovery, he was confident they had the necessary support and tools on board and were comfortable in the driver's seat. The KWRT remains the recognized authority on warbler management. Meetings provide a forum for discussion, the opportunity to engage partnerships, and demonstrate that cooperation among federal, state, and private entities is doable and productive.

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Apendix A

Interview Questions for Kirtland's Warbler Archive and Summary

What was Inherited:

1. Describe the situation faced by the Kirtland's warbler population during the decades before recovery efforts began.

2. Set the stage in regards to the general atmosphere surrounding Kirtland's warbler issues (the state of available habitat, interagency/stakeholder cooperation and conflict, public involvement, etc.) during the years before the establishment of the recovery team.

3. Prior to the Endangered Species Act, what initial steps had already been taken toward setting the Kirtland's warbler recovery process in motion (research, land management efforts, etc.)? How did these inherited practices influence the early direction of the team (were they continued, modified, etc.)?

4. What role did you and other original KWRT members play in Kirtland's warbler (or other species) research or conservation efforts before being appointed to the team?

Beginnings: Establishing the Team:

5. What criteria were used in selecting members of the original recovery team?

6. In regards to the particular combination of agencies represented within the team (MDNR, USFWS, USFS, Michigan Audubon), how was this decision made and why was it determined to be the best arrangement? In your opinion, why did (or didn't) it turn out to be the most effective combination to start with in terms of the work that had to be done?

7. What kinds of previous knowledge/experience brought to the team by individual members proved to be most beneficial to early tasks of the recovery? For what tasks did the group seek outside expertise?

Writing the Recovery/Habitat Management Plans:

8. What (if any) other conservation groups, or habitat management plans written for other species, were consulted during the writing of the KW plans? In what ways did these lend to the process, and how did they influence the final product?

9. How did the team arrive at specifics of the Recovery Plan objectives (for example,why was it decided that reestablishing 1,000 breeding KW pairs would be the goal versus any other number)?

10. Describe the process of writing the original Recovery Plan and Habitat Management Plan in terms of how it was decided which team members would work on which sections, which ideas/variables would be discussed and which eliminated and why, etc.

11. What difficulties arose during the planning/writing process and how were they resolved (team or inter-agency disputes, research needs, etc)?

12. In your opinion, what key elements of the Recovery Plan and Habitat Management Plan proved most helpful in using it as a roadmap for putting the plans into action and why?

13. How was it decided that the particular management practices described in the Recovery Plan would be the best? What other possible solutions were eliminated and why?

14. If you had to write it over again, is there anything you would do differently (elaborate on, add or eliminate, etc.)?

Early Work: Putting the Plans into Action:

15. What were some of the early partnerships forged in the recovery process? Why were these particular partnerships sought? What methods were used to bring them on board? What were the results?

1**6.** What factors (land cover, ownership, etc.) were evaluated in deciding which plots to include in the KW Management Area and which to eliminate? How were these deciding factors determined to be the most significant and have they changed over time with additional research?

17. Describe the process by which management area lands were first acquired?

18. Describe the process of implementing management plans on the units?

1**9.** Throughout the process of choosing and establishing KW management units, how did the KWRT determine which human uses were to be accommodated and which forbidden? What strategies were used for dealing with previously-established human uses of the habitat? Results?

20. During the initial phases of the recovery process, what (if any) level of public participation was sought, and what types?

21. In general, how would you describe the level of public awareness/support of the warbler's situation during the early years of the recovery? How did the implementation of management practices affect area residents and what was the prevailing popular opinion of these practices at the time?

22. Describe some of the methods used to increase public involvement/support and the outcomes of each? Which programs would you consider most successful and why?

23. What methods were used in bringing landowners on board with managing for habitat on private property? Which methods seemed most successful and why?

24. Who from the Recovery Team or cooperating agencies handled public information/involvement and private landowners and how/why were these particular individuals chosen for the task?

2**5.** What groups/agencies were selected as partners in protecting the KW and its habitat along its migration route and on wintering grounds and why? How were they approached and how were the partnerships maintained?

26. What unexpected obstacles arose in carrying out the Recovery Plans and how were they handled? Outcome?

Keeping It Going Through the Years:

27. In what ways did inter-agency/stakeholder cooperation forged early in the recovery process continue to influence its direction? What conflicts of interest between various cooperating groups arose throughout the years and how were they dealt with?

28. During your time working on the recovery, were there mutually beneficial agreements reached between stakeholders with seemingly incompatible goals? If so, what were some successful methods of establishing and maintaining these agreements?

29. Describe some compromises that had to be made and the results.

30. What are some recovery strategies that worked smoothly from the very beginning and are still going strong? What strategies from the earlier years of the recovery had to be discontinued or modified because they were unsuccessful in their original form? If modified, in what ways?

31. In what ways has public involvement helped and hindered recovery efforts over the years?

32. Describe some high and low moments of the recovery that stand out in your memory. How were difficult periods dealt with?

33. How have habitat management techniques and other aspects of the recovery effort been adjusted through the years in response to updated research on the species, improved technology, changes in conservation methodology, etc.?

34. How have habitat management techniques been altered to accommodate multiple species? How have conservation needs of other pine barren species been met?

Legacy:

35. How will the direction of Kirtland's warbler protection and habitat management have to change if is to be continued into the future (especially if species is delisted)?

36. What do you feel has been your greatest contribution to the recovery process?

37. What other recovery teams/conservation groups have sought advice from the KWRT?

38. What advice would you give to other groups seeking to manage for an endangered species, based on your experience working with the KWRT?

39. How would you defend the management efforts to those who think the extensive human intervention that has been necessary to save the KW is over-the-top (in other words, what makes this bird so special!)?

Summary of 8 interviews for Kirtland's Warbler Archive (May-August 2011)

(Participants included Bill Irvine (USFS), Jerry Weinrich (MDNR), Carol Bocetti (CA University of PA), Phil Huber (USFS), Dave Ewert (The Nature Conservancy), Greg Huntington (MDMA), Paul Aird (University of Toronto), and Mike DeCapita (USFWS). Interviews were accomplished by Elaine Carlson and Jerry Weinrich.

All interviewees were given the questions in advance. Dr. Aird replied that he would not be able to have much input on the questions as posed so the interview was significantly modified for him. Some wording was changed throughout the interview process to make the questions easier to read or relevant to the interviewee. Some questions were not asked, especially if the questions had already been answered earlier in the interview or the interviewee had indicated some lack of response to a related question. Giving the questions in advance did seem to make for some canned responses but there was much variability in preparation time per individual and overall, the interviewees appreciated the gesture.

What was inherited:

All but Greg and Dr. Aird repeated the history of population and issues. Bill had prepped the most, had been the most involved in the years before the Team, and his answers match archived information. Jerry was much the same with lots of details. Mike specifically mentioned that Cuthbert saved the Team a lot of time.

Beginnings: Establishing the Team:

Responses were somewhat repetitious from above. Criteria for the Team were listed by Bill as individual credentials. Jerry mentioned experience with the bird. Carol, Mike, and Dave suggested that the group had experience working together. Phil and Dave suggested that diversity was important. Bill said that the USFWS Regional Director decided on the mix for the Team but any rationale or explanation was not found in the archive.
Mike mentioned that John Byelich was the key.
Cowbird control was considered to be outside expertise.

Writing the Recovery/Habitat Management Plans:

Dave and Greg were not involved. Dr. Aird noted the lack of interest outside MI.
Jerry and Phil had numerous details on the habitat part. Bill and Mike both mentioned that FWS provided guidelines. Carol noted that the group had vision. Mike remarked on the importance of measurable goals and support from higher ups. Jerry and Bill knew who wrote what part and their comments mostly match some archived notes.
No one was too sure how goals were established. The population goal was thought to relate to available habitat and territory size and Jerry had a personal memory of a comment from Byelich that he thought may have been somewhat tongue-in-cheek. Bill remembered a life table exercise and mentioned sustainability.
Included in a do-over of the plan were size of cuts, connectivity, and public relations - responses reflecting more recent experiences.

Early Work: Putting the Plans into Action:

This section covered a lot of ground and was not easy to summarize. Experience with the program parts was on display in the interviews.

Partnerships – answers seemed to be related to more recent work but included Audubon groups, timber industry, research, NGO's, Wisconsin
There is a list of factors for designation criteria.
Closures – seasonal, if not detrimental activity would be allowed, military lands considered training first, Team was nervous about limiting too much, move ORV trails, restrict oil and gas development
Public participation – not much sought early, changed with Mack Lake Fire; tours were always important to inform the public
Awareness and support from the public – highly subjective; awareness seemed to increase with controversies like fire and clear-cuts; support was consistent from birding community
Defending the program – answers reflected personal views from honesty, its our job, human influence caused the problem so it is ours to fix, good for local economy, if this species goes, what's next?
Unexpected obstacles – funding, outside group with peripheral interests, personnel issues

Keeping It Going Through the Years:

Some conflicts discussed were military activities, red pine, size of cutting blocks, salvage, application of fire, census.
Most agreed that the recovery strategy that worked from the beginning was cowbird control.
Low points were the Mack Lake Fire, slow bird response in early decades, frustration with having to repeatedly make the same requests to the Team. High points were reaching the population goal, the present members of the Team, Bahamas connection.
Most knew of the adjustments to the habitat strategy and all felt that this management accommodated multiple species.

Legacy:

The interviewees have shared much information with other recovery teams, military colleagues, and through public contacts.
Advice to others included the need to develop cooperative and long-term partnerships, use a landscape approach, leave biases behind, be honest, do not wait for all the research to be completed – just do something.
Most recognized that a funding source would have to change, especially if species was de-listed.
The answers to "your greatest contribution to recovery efforts" followed the individuals' professional experience – shaped habitat, research, Bahamas, cowbird control, settle issue with Military, passion and persistence, being honest.

Others interviewed for archive:

KCC - Jim Enger and Dennis Mansfield

MDNR, Wildlife Division – John Nellist, Keith Kintigh, Ray Perez, Pat Lederle, Nels Johnson, Elaine Carlson, Keith Fisher, Bob Hess, Sylvia Taylor

MDNR, Forest Resources Division – Jim Bielecki, Bill O'Neill, Susan Thiel, Mike Mang

USFS – Bill Jarvis, Rex Ennis, Steve Sjorgen, John Probst

USFWS – Christie DeLoria, Chris Mensing

Detroit Audubon – Jim Bull

Appendix B

List of Kirtland's Warbler Recovery Team Members 1975-2012

Name	Years on Team			Affliation
John Byelich	1975	1989	Leader 1975	MDNR
Nels Johnson	1975	1989		MDNR
Robert Radtke	1975	1990	Leader 1990	USFS
William Irvine	1975	1989		USFS
William Shake	1975	1975		USFWS
Wes Jones	1975	1989		USFWS
Harold Mayfield	1975	1989		Citizen
Jim Mattson	1976	1976		USFWS
Dick Winters	1977	1984		USFWS
Paul Aird, Associate Member	1978			Ontario
William Mahalak	1980	1997		MDNR
Michael DeCapita	1984	2008		USFWS
Rex Ennis	1990	2006	Leader 1991	USFS
George Burgoyne	1990	1993		MDNR
Gary Boushelle	1990	1999		MDNR
William Jarvis	1990	1993		USFS
Ron Refsnider	1990	1997		USFWS
John Probst	1990	2009		USFS
Paul Sykes/Cam Kepler	1990	1998		USFWS
Thomas Weise	1993	1999		MDNR
Phil Huber	1993			USFS
Michael Tansy	1997	2004		USFWS
Donald Hennig	1998	2003		MDNR
Carol Bocetti	1998		Leader 2006	University
Jerry Weinrich	1999	2003		MDNR
Raymond Rustem	1999	2001		MDNR
Eric Carey	2000			Bahamas
Patrick Lederle	2001	2005		MDNR
Elaine Carlson	2003	2010		MDNR
James Bielecki	2003	2010		MDNR
Tracy Casselman	2004	2009		USFWS
Todd Hogrefe	2005	2008		MDNR
Steve Sjogren	2006			USFS
Christie Deloria	2008			USFWS
Chris Hoving	2008			MDNR
Mark Vaniman	2009			USFWS
Ken Tuininga	2009			Ontario
Dan Ecklund	2011			USFS - WI
Keith Kintigh	2011			MDNR
Tim Greco	2011			MDNR

Appendix C

A Century of Kirtland's Warbler Highlights

Prepared by R.P. Moran

1903 - First nest discovered
1920 - Role of wildfire recognized
1921 - Cowbird parasitism observed
1930 - Life history field studies
1951 - First census of singing males
1956 - Dedicated lands and a Preserve Committee
1962 - Habitat is the key
1963 - Government agencies and public pull together
1967 - Declared endangered
1971 - Census sounds alarm and Advisory Committee formed
1972 - Cowbird nest parasitism a major target
1973 - Federal Endangered Species Act passed
1974 - Michigan enacts Endangered and Threatened Species law
1975 - Interagency Recovery Team, Recovery Plan, research postponed
1977 - Singing male found in Ontario
1978 - Singing males found in Wisconsin
1980 - Habitat management plans prepared; Mack Lake Fire setback
1981 - Research accepted and contributes
1982 - Singing male found in Michigan Upper Peninsula
1983 - MDMA hires "go-between" who helps change relations with RT
1991 - Kirtland's Warblers go public
1995 - First nest found in UP
1996 - Kirtland's Warbler Wildlife Festival at Kirtland Community College
2000 - Building relationship with the Bahamas
2001 - Kirtland's Warbler population goal reached
2002 - Population goals clarified and path to status change recommended
2007 - Kirtland's Warbler nests found in Ontario and Wisconsin
2011 - Cooperative partnership with National Fish and Wildlife Foundation developing