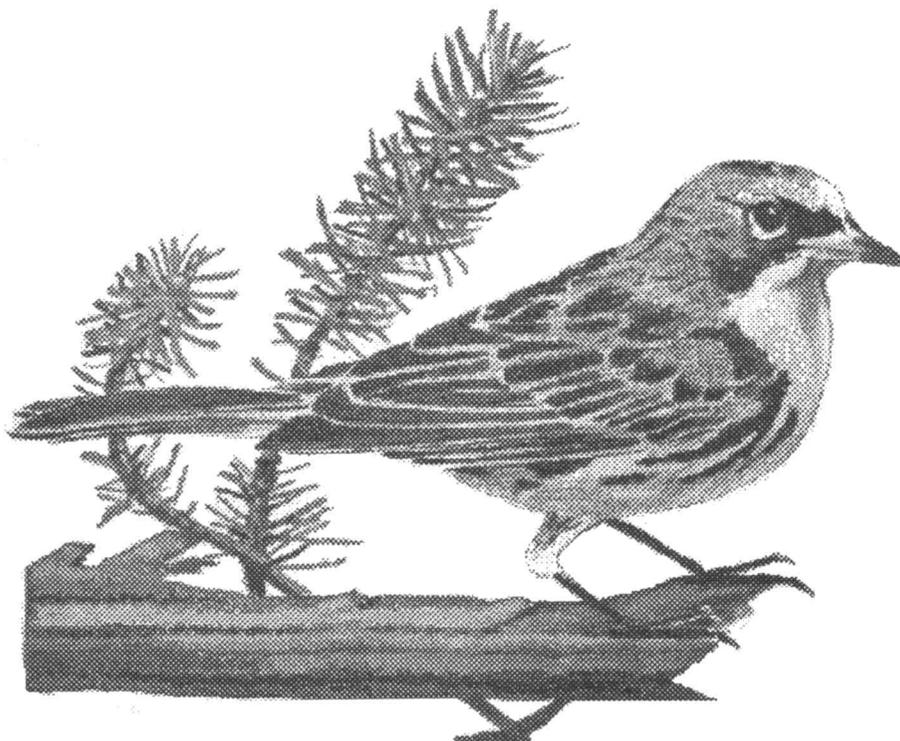


**SUMMARY OF RECOVERY EFFORTS  
KIRTLAND'S WARBLER 1999**



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**September 23, 1999**

## INTRODUCTION

The Kirtland's warbler, one of our nation's rarest songbirds, was one of the first species to be placed on the endangered species list in 1973. This highly specialized blue and yellow sparrow-sized bird nests nowhere in the world but northern Michigan. The warbler prefers stands of jack pine trees 6 to 20 years old, which are the natural result of forest fires. Modern forest fire suppression, necessary to protect human life and property, prevents natural regeneration. Intensive management of the forested lands in Michigan is necessary to provide sufficient breeding habitat for this bird. The U.S. Fish and Wildlife Service (Service), U.S. Forest Service (USFS), Michigan Department of Natural Resources (MDNR)

## HABITAT MANAGEMENT

There are approximately 157,000 acres of jack pine stands designated for Kirtland's warbler nesting habitat on 24 management areas within state and federal lands. The management areas consist of 68,000 acres in the Huron-Manistee National Forests, 78,000 acres within the AuSable, Mackinac, and Pere Marquette State Forests, 4,000 acres of state military land, and 6,684 acres of Service land interspersed throughout the state forest areas. These areas are considered essential habitat and are being managed to provide a sustained, even flow of suitable nesting habitat. Management of warbler habitat consists of logging, burning when possible, and planting designated tracts of land on a 50 year rotation to provide about 30,000 acres of productive nesting habitat at all times.

The MDNR received \$58,125 in Endangered Species Act Section 6 funds in FY99 from the Service. In addition to funding, the Service purchased a TTS Sigma Seeder for \$9,350 for the MDNR to use. Further

and the Michigan Audubon Society have been cooperating since 1971 to ensure the future of the Kirtland's warbler. Department of the Interior recovery efforts include cowbird control, habitat management and an education and outreach program for the local communities situated in and around the Kirtland's warbler nesting area. This report will summarize the recovery efforts conducted by the four cooperating agencies during fiscal year 1999 (FY99). The East Lansing Field Office spent \$109,338 in FY99 to carry out activities relating to the recovery of the Kirtland's warbler. The approximate cost of project efforts are given when available.

contributions from Detroit Edison, through the U.S. Department of Energy carbon sequestration program, helped offset funding shortages. Funds were used to cover the cost of purchasing jack pine seedlings, maintaining tree planting equipment, and hiring short-term workers to work on tree planting crews.



The MDNR's Division of Wildlife planted trees on 3,120 acres of state forested lands designated as Kirtland's warbler management units (KWMU) (Table 1). The TSS Sigma seeder helped MDNR directly seed 2,550 acres of state land and 200 acres of Service land. The MDNR crews hand planted an additional 46 acres of Service land with fill-in trees. The MDNR conducted a prescribed burn on 50 acres and logged approximately 2,500 acres of Kirtland's warbler nesting habitat. A total of 8,220 acres of state land was managed for Kirtland's warbler nesting habitat in FY99.

In FY99, the USFS seeded 379 acres, logged 1,511 acres and had a wildfire on 300 acres (Table 1). Certified natural revegetation occurred on 312 acres for a total of 2,502 managed acres on USFS land.

Service lands are administered by Seney National Wildlife Refuge and cooperatively managed by the Refuge and MDNR. In addition to the 200 acres of direct seeding and 46 acres of fill-ins planted by the MDNR, 280 acres of Service land were logged and 616 acres of trees were planted (Table 1). Total managed Service land in FY99 was 1,142 acres.

Table 1. Federal and state Kirtland's warbler nesting habitat management practices. (Numbers in parentheses indicate acres treated).

	Michigan DNR (82,000 acres)	US Forest Service (68,000 acres)	US Fish and Wildlife Service (6,684 acres)
Logging	2500	1,511	280
Plant	3120	0	616
Fill-in Plant	0	0	46
Trench	2550	379	200
Prescribed Burn	50	0	0
Wildfire	0	300	0
Natural Revegetation	0	312	0
Totals	8,220	2,502	1,142

## **COWBIRD CONTROL**

Brown-headed cowbirds, obligate nest parasites, were reducing warbler annual production to less than one young per pair prior to 1972. Each year since 1972, Service biologists have trapped and removed cowbirds from warbler nesting areas.

Survival of the Kirtland's warbler is unlikely without cowbird control. Sixty-seven cowbird traps, including 14 new ones, were activated during the week of April 19, 1999. The Service contracted for the construction of trap panels (\$1,120) that were assembled on-site by Service personnel. A total of 340 cowbirds (start-up decoys for the cowbird traps) were trapped during March and early April in Sandusky, Ohio by U.S.

Department of Agriculture Wildlife Services biologists. White millet was placed in each trap to attract cowbirds and to feed decoys (\$475). Miscellaneous supplies purchased (\$2,591) included tools, staples, tape, nails, and research equipment.

Six temporary employees (four cowbird trappers, one trapper/tour guide and one supervisor) were hired for the trapping season of April 19 - June 30. The supervisor worked from March 25 through

## **CENSUS**

The annual Kirtland's warbler census was June 6 - 15th. Service, MDNR, and USFS biologists participated in the census along with volunteers from the Michigan Audubon Society and local communities. The participants counted an unprecedented record high of 904 singing males in Michigan and one singing male in Ontario, Canada. There were 885 singing males recorded in the lower peninsula and 19 in the upper peninsula. This was an increase of 11% from last year's record high of 804.

The 1980 Mack Lake Burn habitat had only 14 males this year. Most of the habitat is

December 31, 1999 to assist permanent staff with pre/post season activities (\$13,363.20). Travel expenses during the trapping season were \$6,444. Another \$41,173 was used to cover partial salaries of other permanent staff.

Seven vehicles were used to carry out cowbird control activities in FY99. A total of 56,789 miles were accumulated on the seven project vehicles during the trapping season. To keep these vehicles in operating condition, funds were used for gas (\$3,800) and vehicle maintenance (\$6,250). Seven cellular phones were used to facilitate communication with and safety of temporary employees who had no office in the project area (\$2,325).

A total of 4,399 cowbirds were captured in 1999 compared to 3,143 in 1998. The average annual cowbird catch for 28 years is 4,030. Since 1972, 112,851 cowbirds have been removed from Kirtland's warbler nesting areas.

now unsuitable. Managed habitat in the Mack Lake area held 88 males. Loss of the Mack Lake Burn habitat which held 300 males in 1994 (Figure 1) has been compensated for by an increased acreage of managed habitat. Only one quarter of the population of singing males was found in wildfire regenerated sites while planted jack pine stands provided nesting habitat for 73% of singing males in 1999. The overall Kirtland's warbler population increase indicates that the population can be sustained with good management practices and without absolute dependency on wildfires.

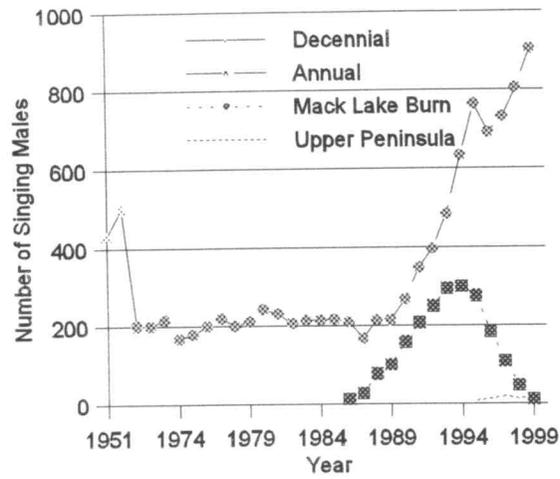


Figure 1. Census of male singing Kirtland's warbler, 1951-1999, with Mack Lake Burn Census. (Michigan Department of Natural Resources)

## RESEARCH

### Banding and Simulation Model

From 1995 - 1997 an intensive banding project took place to develop a Kirtland's warbler population model. The Recovery Team recommended supplemental banding operations to continue in the wake of the three year banding project. Supplemental banding will help monitor the colonization of Kirtland's Warblers in Michigan's upper peninsula (U.P.). It is funded mostly by the USFS, while USGS-BRD trains the banders. USGS-BRD and USFS research personnel provide advice and write up and/or report results. Researchers must continue to search for and identify banded Kirtland's warblers in order to get the best possible survival and dispersal data.

In 1999, a total of nine Kirtland's warblers were banded in the U.P. Eight previously banded birds were also observed during the

banding season. At least four of the previously banded birds were banded in the lower peninsula. Banding results document movement from the lower to the upper peninsula and help refine survival and dispersal estimates.

During banding, inventorying and monitoring in the upper peninsula, cowbird locations were recorded in the Rapid River area. In the Gwinn area a cowbird egg was found in a Kirtland's warbler's nest. This situation will be monitored in future years. Possible cowbird trapping efforts will need to be reinitiated for the 2000 trapping season.

## **Graduate Studies**

### Habitat Management

Gregory Houseman from the Department of Biological Sciences out of Illinois State University completed his studies: The Effects of Pre-harvest Shade, Planting Delay, and Prescribed Burning on Ground Cover Preferred by Kirtland's Warbler. This study focused on management techniques that created preferred nesting cover for the Kirtland's Warbler.

### Jack Pine Growth Factors

Glenn Palmgren of the University of Michigan is finishing a study concerning the factors that affect the growth response of jack pine. His studies revealed that jack pine height and growth is different in different ecosystems due to physiography, climate, soil and biota. With this knowledge, managers can make accurate predictions on when Kirtland's warblers will occupy a jack pine stand.

### Kirtland's Warbler Diet

Christie Deloria (Michigan State University) is analyzing fecal samples to study Kirtland's warbler diet and its relationship to the warbler age, sex and jack pine stand characteristics. The fecal samples were collected in 1995-1997 during the population simulation model banding project. The basis of the study is to determine Kirtland's warbler diet during the breeding season in Michigan. She is analyzing diet comparisons between and among males, females and different age classes. Deloria is also comparing diet composition between and among assorted jack pine stand characteristics. The

information should help managers make recommendations to assist in the recovery of the Kirtland's warbler.

### Allegheny Mound Ant

Heather Rowe from Michigan State University is studying how mound ant production is affected by aging/succession of jack pine habitat. The Allegheny ant is a predator species. One aspect of Rowe's study is to determine if the Kirtland's warbler and the Allegheny mound ant have the same diet and if they compete for the same prey.

### Brown-headed Cowbird Community Effects

This study was completed in 1998. It has not been reported in any previous Recovery Effort report. Krista DeGroot of the University of British Columbia completed a study on the affects the brown-headed cowbird may have on songbird communities. By using existing cowbird removal sites as study areas, DeGroot ascertained that a greater number of suitable songbird hosts species were present at cowbird removal sites but songbird diversity at control sites was similar to those at removal sites. Management implications conclude that if budget constraints limit cowbird removal efforts, the habitat needs of other preferred hosts should be considered. Those species would act as buffers for Kirtland's warblers; taking some parasitism pressure off Kirtland's in the event that cowbird trapping can no longer be funded.

Appendix 1 lists additional pending publications of Kirtland's warbler research.

## **PUBLIC AWARENESS**

### **Tours**

In 1999, guided tours to Kirtland's warbler habitat were conducted by the Service twice daily from May 15 - July 4. The Service hired one temporary biological technician to give these public tours. Through a cooperative agreement with the Service, Michigan Audubon Society provided \$1,500 to help cover the salary of the tour guide. Grayling Holiday Inn provided a meeting place for the tours. The 1999 Service tours were used by 917 people from 42 states, 3 Canadian provinces, Australia, Germany and England. Tour attendance increased 18.6% from 1998. The USFS tour, offered in Mio five days per week at 7:00 a.m. only, was

taken by 485 people in 1999. The USFS charged \$5.00 per person for the tours under the Recreation Fee Demonstration Project.

The tours were publicized by distribution of specific tour information to local and national bird related groups. Also, a tour flyer was distributed to Michigan State Highway information centers and local chamber of commerces and businesses. The Holiday Inn contributed \$200 towards the production of these flyers. Tour information can also be found on Service and USFS Internet web pages.

### **Kirtland's Warbler Festival**

The Sixth Annual Kirtland's Warbler Festival was held May 22 - 23, 1999 at the Kirtland Community College. Over 100 volunteers and groups were involved in this year's festival such as the local chamber of commerce, community organizations, schools, and local, state and federal agencies. Environmental issues, the AuSable River and the jack pine ecosystem were the focus of this year's festival.

Vendors displayed nature books, arts and crafts, wildlife art, wood carvings, pottery and informational booths. Approximately 5,000 people attended the events at the Kirtland's Warbler Festival this year. Future concerns of the success of the Kirtland's warbler festival are the need for new membership and new funding sources.

### **Auto Tour**

The Jack Pine Wildlife Viewing Auto Tour is a 58 mile long habitat-forestry learning experience designed to generate support for, and an understanding of, jack pine management. This auto tour not proceeds you through areas inhabited by the endangered Kirtland's warbler, but through a variety of habitats providing opportunities to see many kinds of wildlife including bald eagles, white-tailed deer, bluebirds and beavers. The tour has thirteen specific interpretive stops along the route with

several stops offering scenic overlooks of the Au Sable River. Brochures for the tour were updated in 1999.

The National Fish and Wildlife Foundation awarded a \$1,000.00 grant and the Service provided \$1,250.00 to hard surface the AuSable Scenic Vista tour stop, which offers a view of the Alcona pond and AuSable River.



## RECOVERY TEAM MEMBERSHIP CHANGES

Three Recovery Team members resigned in 1997 - William Mahalak and Gary Boushelle retired and Tom Weise had a transfer of duties. The Service appointed

Donald Hennig, Raymond Rustem and Jerry Weinrich, all of the MDNR, to fill the vacancies.

## PLANS FOR 2000

In 2000, a project to construct a history of the Kirtland's Warbler Recovery Team will get underway. History will cover a listing of team members and dates in which they served on the Recovery Team. Participants will be asked to prepare write-ups on their association with recovery efforts. The end result will be a compilation of the Recovery Team in book form.

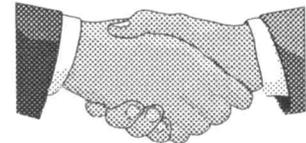
A revision of USFS and MDNR habitat management plans should be in effect by 2000. It will schedule out the next 10 - 20 years of habitat management activities. The revision will also include land acquisition recommendations.

The Recovery Team will consider a revision of the Kirtland's Warbler Recovery Plan in order to clarify or amend the recovery goal. The Kirtland's warbler population is approaching the current recovery goal of 1000 pairs. In spite of this, the Recovery Team does not believe that delisting or reclassification would be immediately

appropriate upon attainment of 1000 pairs.

The USFS contracted a translation of the Kirtland's warbler simulation model to ArcView. A first draft of the instruction manual has been written and is available for use. The MDNR jack pine stand data needs to be entered into the database to complete the model. This tool is used to facilitate Kirtland's warbler management efforts.

The Recovery Team hopes to continue communication with the Canadian Wildlife Service (CWS), Bahamian government and Bahamian National Trust personnel. The Recovery Team reviewed and commented on a CWS draft document entitled "National Recovery Plan Strategy for Kirtland's Warbler". Efforts to identify new potential partners that are interested in assisting with future recovery efforts of the Kirtland's warbler will continue.



**Appendix 1**  
**Kirtland's warbler Recovery Team Publications in progress**

**Evaluation of mist net sampling as an index to productivity.**

Auk

Bart, Kepler, Sykes and Bocetti. (Submitted May 1998)

**Foraging ecology of Kirtland's warbler in managed and natural breeding habitat.**

Auk

Fussman, Grubb and Bocetti. (Submitted June 1998)

**Effects of population and habitat characteristics on density of Kirtland's warblers in Michigan.**

Conservation Biology

Bocetti, Bart and Probst. (Submitted spring 1999)

**Expansion of Kirtland's warbler breeding range in Michigan's upper peninsula.**

Wilson's Bulletin

Probst, Bocetti and Sjogren? (Submitted spring 1999)

**Development of a population simulation model for Kirtland's warbler: decreasing parameter space provides less uncertainty.**

Ecological Applications or Conservation Biology

Bart, Bocetti, Kepler, Sykes and Probst. (Submitted spring 1999)

**Survivorship estimates for Kirtland's warblers using capture-recapture procedures.**

Auk

Kepler, Bocetti, Sykes, Bart and Probst. (Submitted September 1999)

**Habitat features preferred by Kirtland's warblers on breeding territories in Michigan.**

Wilson Bulletin

Kepler, Sykes, Bocetti and Remillard. (Submitted September 1999)

**A stepwise approach to patterns of Kirtland's warbler habitat occupancy.**

Journal of Biogeography

Probst, Donner-wright, Bocetti and Gustafson? (Draft by 2/00)

**Kirtland's warbler arrival times on the breeding grounds relative to habitat quality and male age.**

Auk?

Probst and Donner-Wright. (Draft fall 1999)

**Pattern of male plumage variations in Kirtland's warbler.**

Journal of Field Ornithology?

Probst and Donner-Wright? (Analysis complete, figures drafted by 1/99)

**Review of sight records of Kirtland's warbler in winter: a problem of correct identification.**

Wilson Bulletin

Sykes, Kepler, White and Clench. (Early writing stage)

**Food and foraging by Kirtland's warbler during winter in the Bahamas.**

Wilson Bulletin

Sykes, et al. (Early writing stage)

**Dispersal rates and the process of site selection by Kirtland's warblers on the breeding grounds.**

Ecology

Bart, Bocetti, Kepler, Sykes and Probst. (Analysis stage)

**Dynamics of Kirtland's warbler stand colonization and duration of use.**

Landscape Ecology

Probst, Barnes, Kashian, Walker and Palmgren. (August 2000)

**Evaluation of the annual Kirtland's warbler singing male census.**

Journal of Wildlife Management

Probst, Weinrich, Bocetti?, Worland?, and Donner-Wright? (Draft by November 1999)

**Diet analysis of Kirtland's warblers in late summer and early fall.**

(Author's first choice of journal)

Deloria, Bocetti, Sykes and Kepler. (Analysis stage)

**Genetic diversity of Kirtland's warblers in colonies on the breeding grounds.**

(Author's first choice of journal)

Barrowclough, Bocetti, Sykes and Kepler. (Analysis stage)

**Site fidelity of a male Kirtland's warbler on the breeding and wintering grounds.**

Wilson Bulletin

Sykes. (Writing stage)

**Plant succession and fire influence on ground cover components in Kirtland's warbler habitat.**

American Midland Naturalist

Probst. (Drafted - to reviewers January 1999)

**Development of an over-wintering technique for Kirtland's warblers: a compromise between translocation and captive breeding.**

Wildlife Society Bulletin

Bocetti. (Writing stage)

**Pairing success and reproductive success of male Kirtland's warblers in managed and natural breeding habitat.**

Condor

Bocetti. (Writing stage)

**Density and demography of Kirtland's warblers: evaluating the habitat management program.**

Conservation Biology

Bocetti. (Writing stage)

**Patterns of Kirtland's warbler nest site placement.**

Animal Behavior

Bocetti and Bart? (Writing stage)