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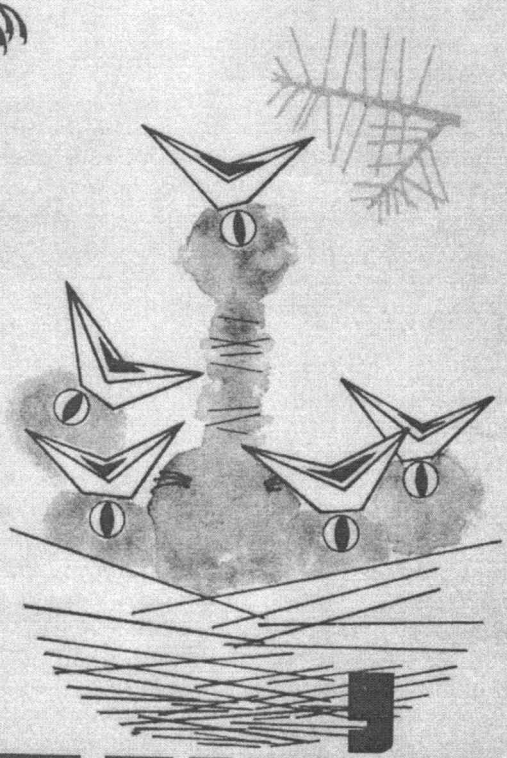
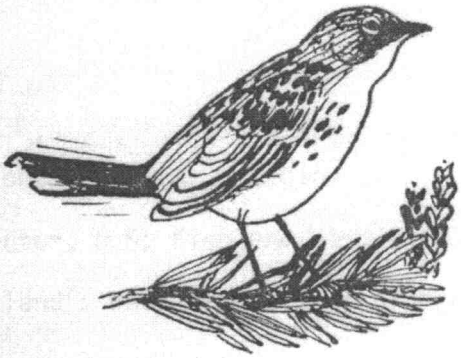


# KIRTLAND'S WARBLER...

## recovery plan

# KIRTLAND'S WARBLER

# RECOVERY PLAN



Prepared by

Kirtland's Warbler Recovery Team

1976 Date?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ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

In Reply Refer To:
FWS/OES 310.6

Memorandum

To: Regional Director - Region 3

From: Director, U.S. Fish and Wildlife Service

Subject: Kirtland's Warbler Recovery Plan

We fully agree with your memorandum of June 16 on the general quality of the subject plan, and concur with its adoption with only one major exception. We feel that the portion of the plan proposing a transplant outside the species known historical range using a foster parent approach needs further study before it can be considered for implementation. You already acknowledge that the proposed funding schedule is unrealistic as to timing.

The general format of the plan is excellent. The introduction is well written and the narrative explanation of objectives and actions identified in the outline is good.

We have a number of more specific comments and requests relative to implementation and refinement of the plan.

As mentioned above, we cannot accept, pending further evaluation, item 5 of the outline which calls for a transplant. This second echelon objective is captioned as a reintroduction, but in terms of known historical range appears to be a true introduction. The means by which this objective would be attained are unclear. While we understand the rationale to be a safety valve in the event of a catastrophic situation, we question the wisdom of initiating the project at all. If done, it should be initiated with some long term research projects that again might well tell us such a project would be unwise. Work with captives would almost surely be advisable in advance of actual trials. Various alternative transplant methods should be considered of which the proposed foster parent approach would be only one. As a matter of both policy and practical biology,

we question introducing the species outside its historical range. If there were other areas suitable for the Kirtland's Warbler in Michigan, Wisconsin and Minnesota, it would be there now. There are, in addition, some potential hazards to the foster parent approach including possible hybridization and imprinting. This could present a difficult problem to cope with for such a small and elusive species. We feel the possibility of safely establishing a second population is remote. Unless you and the team can present acceptable arguments to the contrary, it should not be initiated without thorough study. There is some risk in this position because this could leave us without a fall-back population. Certainly, a more thorough discussion of the pros and cons is in order.

The step-down outline, while largely sound, should be revised and refined. There are some inconsistencies and instances where actions identified will not meet stated objectives. In some areas, the outline needs more specifics, or follow-up documents are needed. To explain, the following examples are provided.

Item 1.1 reads "Determine total acreage of jack pine stands suitable for managing for K. W. nesting habitat," yet item 1.3 and the text on page 8 indicates this is known and amounts to 120-135,000 acres plus a limited amount of private land. Perhaps the intent of item 1.1 is to map, or otherwise refine and delineate this acreage. The primary objective calls for establishing a minimum population of 1,000 pairs. With respect to breeding habitat, the 1,000 pairs are fully accommodated under item 1.3, which covers public lands only. Item 1.4, to manage jack pine on private lands, therefore, appears extraneous. If private lands do not fit into the primary objective, item 1.4 and associated costs can be dropped. This is an important matter to clarify since land acquisition is proposed and scheduled several years in advance.

A number of job assignments are too vague at this stage of the plan development to enable an agency to proceed without additional direction. Either a land-use plan or the recovery plan must schedule for the manager the specific areas or sites that are to be treated by burning, thinning, etc.. Likewise, we need to have the tracts to be purchased or leased identified. No provision is made for this in the step-down or implementation schedule. Although the schedule identifies land acquisition to be a joint responsibility of the Department of Natural Resources and Forest Service, the Forest Service does not have authority to purchase lands for Endangered species using LWC funds. This would be a FWS responsibility using the above funds or of the DNR, presumably using grant-in-aid funds.

At several points, the step-down outline carries only one sub-objective or task under a given objective. For example, there is no 2.111-2 to go with 2.111-1. Item 2.111-1 should either be combined with 2.111 or

placed on a parallel basis between 2.111 and 2.112. Other examples include 2.124-1 that should be combined with 2.124, and 3.211-1 that should be combined with 3.211(1). Trapping cowbirds, as called for by 3.211-11. will not accomplish the monitoring objective of 3.211-1. Items 3.211-3 and 3.211-4 call for determining what animals other than cowbirds and blue jays are adversely affecting the warblers, but does not suggest any action be taken against such animals. It would appear appropriate action should be taken if such animals prove to be a menace. We wonder if there is any evidence such animals are a problem, and if so, how a $1,000 annual expenditure can determine if these animals are having a long-range adverse affect. A certain amount of predation or competition could be healthy.

Item 2.21 reads "Protect key habitat components along the migration route," but actions identified to accomplish this only define the migration route and would not protect it. Likewise, item 2.22 calls for eliminating or reducing adverse environmental factors during migration, but action objectives 2.221 and 2.222 call only for monitoring and fact finding. This could be rectified with a 2.223 to read, "Develop and implement feasible corrective measures for any significant adverse factors found." However, we know nothing can be done to change weather hazards; and there is nothing to lead one to believe pesticides are a problem from the information provided. If pesticides are a potential problem, wouldn't egg shell thickness and blood sampling be a starting point?

Item 3.211-2 covers transportation of blue jays and indicates they adversely affect the warblers. The text does not indicate jays are a problem. Perhaps this action should be identified as a part of the cowbird control operation.

While we like the radio telemetry proposal, this appears to be a few years off pending development of satisfactory packages small enough for birds of this size.

Page 20 calls for research on soil and vegetation, but we did not locate such research in the outline. Is it needed? It appears information on soil and vegetation as related to the warbler is already known.

The 45 to 50 year jack pine rotation proposal for public lands, as covered on page 18 needs clarification. Considering the fact Kirtland's Warblers use pine stands in the 8 to 21 year stage, what is the purpose of maintaining stands over 21 years of age? If maintaining trees to the 45 to 50 years age class is for timber production, is this consistent with Section 7 of the Endangered Species Act? What would be the result of a 21-year rotation on the entire acreage; could a

sufficiently large and secure population be maintained to qualify the Kirtland's Warbler for Threatened rather than Endangered status or even removal from the list?

We were disappointed in reading the letters from cooperating agencies that none commented on funding possibilities for actions proposed for them. There are no letters from some of the proposed cooperators. We wonder if they were contacted relative to funding. This is your responsibility and not that of the team leader. Please follow up on this.

This memo should accompany the plan which can be released as an approved interim plan with the provision that it is further refined in accordance with the above comments. We need a response to our questions at an early date, and would like a date for a plan revision.

We are in full agreement on the urgency of implementing at this time items identified on page 31.

Please express our gratification to the recovery team for a job well done to this point. Please consider our long list of questions and comments as completely constructive. In perspective, this plan is one of the best received to date.

Please send 25 additional copies of the current version of the plan.

Keith M. Schreiner

KIRTLAND'S WARBLER
RECOVERY PLAN

KIRTLAND'S WARBLER
RECOVERY PLAN

PART I

INTRODUCTION

## Status

The Kirtland's Warbler, Dendroica kirtlandii, discovered in 1851 when a migrant was taken near Cleveland, Ohio, probably has never been an abundant bird. No serious attempt to estimate its numbers was made until 1951. At that time, on the hundredth anniversary of its discovery, it became the first songbird in the world to have its entire population censused. Several groups of ornithologists working in cooperation visited all the suitable habitat within the known nesting range and counted the singing males. Four hundred thirty-two males were found. The number of females was judged to be about equal to the number of males, and so the total population was put in the neighborhood of 1,000 birds (Mayfield, 1953).

Nest observations made during the 1940's and 50's showed that the production of young was so low as to raise doubts if the species could maintain itself. However, a repeat census in 1961 revealed 502 males. Hence, the total population was still in the vicinity of 1,000 birds (Mayfield, 1962).

The third decennial census was held in 1971. At this time the dire predictions of the previous decade came true. The count showed a 60 percent decline to 201 singing males (Mayfield, 1972). The population was down from about 1,000 birds to about 400. Immediately the frequency of the censuses was stepped up to yearly, and the count from 1971 to 1975 has been essentially level although with some decline in 1974 (Mayfield, 1973a, 1973b, 1960; Ryel, 1976).

In the decline between 1961 and 1971 the population did not simply thin out across its entire nesting range but collapsed back into the center of its range. Here, nesting continued at normal density. The reduction in numbers and area utilized is as follows:

Population Trend, Kirtland's Warbler 1951-1975

| Year | Males | Counties | Sections (sq. mi.) |
|---|---|---|---|
| 1951 | 432 | 8 | 91 |
| 1961 | 502 | 9 | 86 |
| 1971 | 201 | 6 | 27 |
| 1972 | 200 | 4 | 27 |
| 1973 | 216 | 4 | 25 |
| 1974 | 167 | 5 | 27 |
| 1975 | 179 | 6 | 31 |

## Past and Present Distribution

The narrow habitat requirements of the Kirtland's Warbler have always limited its range severely. Presumably the bird nested in the conifer zone on the sandy outwash plains in the wake of the Wisconsin Ice Sheet. This conifer zone was a comparatively narrow strip across the north central states, and the amount of this specific habitat suitable to the warbler at any one time probably was small. The few specimens taken east and west of the present migration path suggest the possibility of former nesting grounds in Minnesota, Wisconsin and Ontario, but there is no hard evidence of any nesting outside Michigan.

The nesting ground was discovered in 1903 near the Au Sable River almost on the boundary of Crawford and Oscoda counties. Fully 90 percent of all the nests found since that time have been located in the drainage of this stream (Mayfield, 1960). Since 1903, nests have been found in the following 13 counties but not in all of them at one time (Fig. 1):

| | | | |
|---|---|---|---|
| Alcona | Crawford | Montmorency | Otsego |
| Alpena | Iosco | Ogemaw | Presque Isle |
| Clare | Kalkaska | Oscoda | Roscommon |
| | | | Wexford |

In the 1970's virtually all the nests have occurred in Crawford, Oscoda and Ogemaw counties (Fig. 2).

In migration the bird travels a fairly direct route between its nesting and wintering ranges, entering and leaving the continent at the coast of North and South Carolina (Mayfield, 1960).

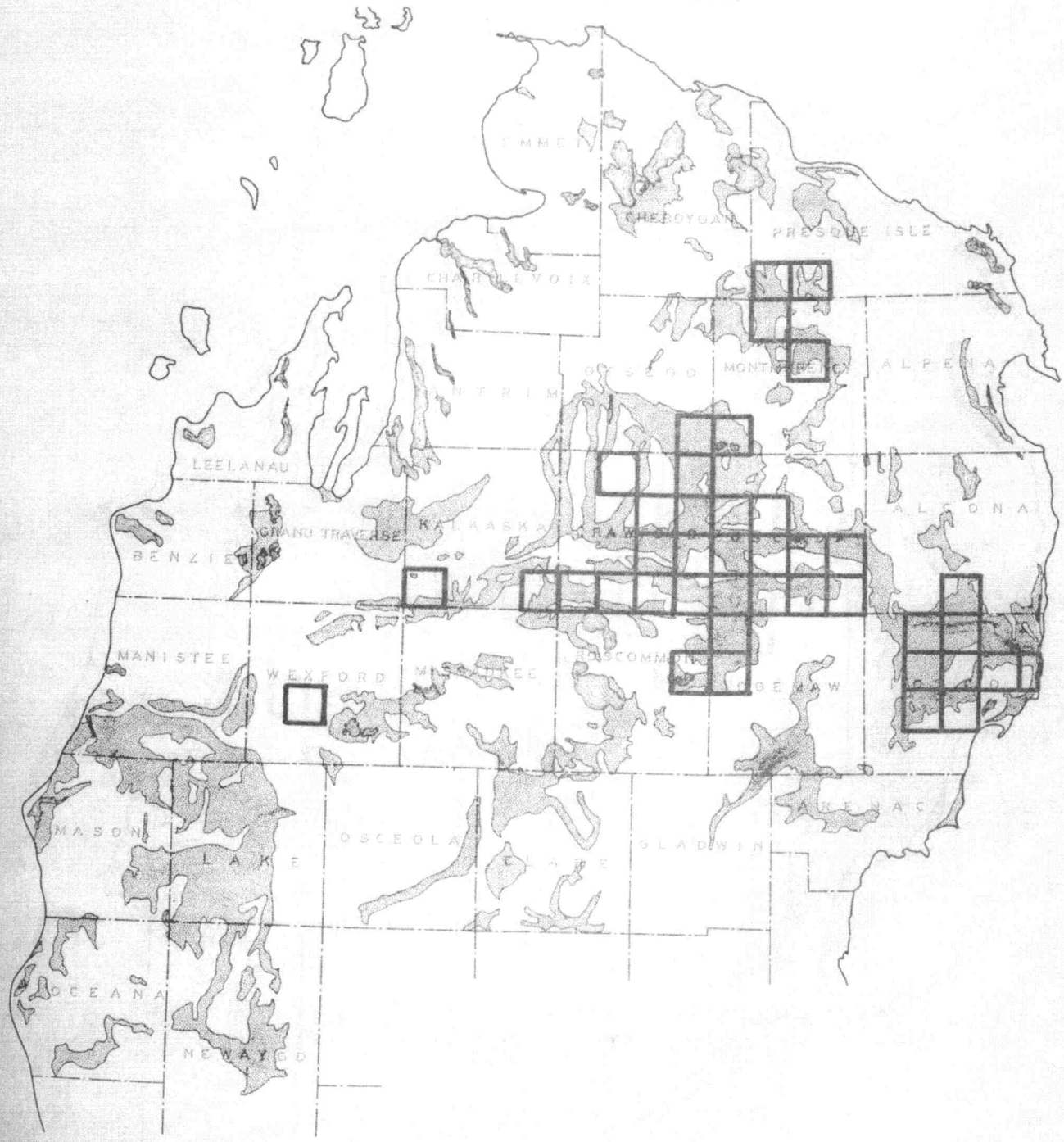
The wintering range of the Kirtland's Warbler is believed to be limited to the Bahama Islands. Between September and April the bird has never been seen anywhere else. In the 1880's and 1890's specimens were taken on nearly all the larger islands in the Bahama group, and there have been many subsequent chance sightings by tourists. It has been extremely difficult, however, to find the bird in recent years, so little information about its wintering behavior and habitat requirements is available. Apparently, it occupies low broad-leafed scrub which is the prevailing vegetation type in that region (Radabaugh, 1974).

## Habitat Requirements

The breeding habitat of the Kirtland's Warbler is highly distinctive. Nearly all of the nests have been found in jack pine stands 5 to 20 feet in height (8-21 years old) which have resulted from forest fire. Fire also maintains the low ground cover that must be just adequate to conceal the nest which is usually imbedded in the soil. Nearly all the pines in the stand must be small, and the occurrence of deciduous trees must be limited. A tract must be at least 80 acres and preferably much larger to attract the warbler. Ideal breeding habitat consists of homogeneous thickets of small jack pine interspersed with many small openings.

Figure 1

# FORMER STATUS OF KIRTLAND'S WARBLER NESTING RANGE IN MICHIGAN (since 1951)

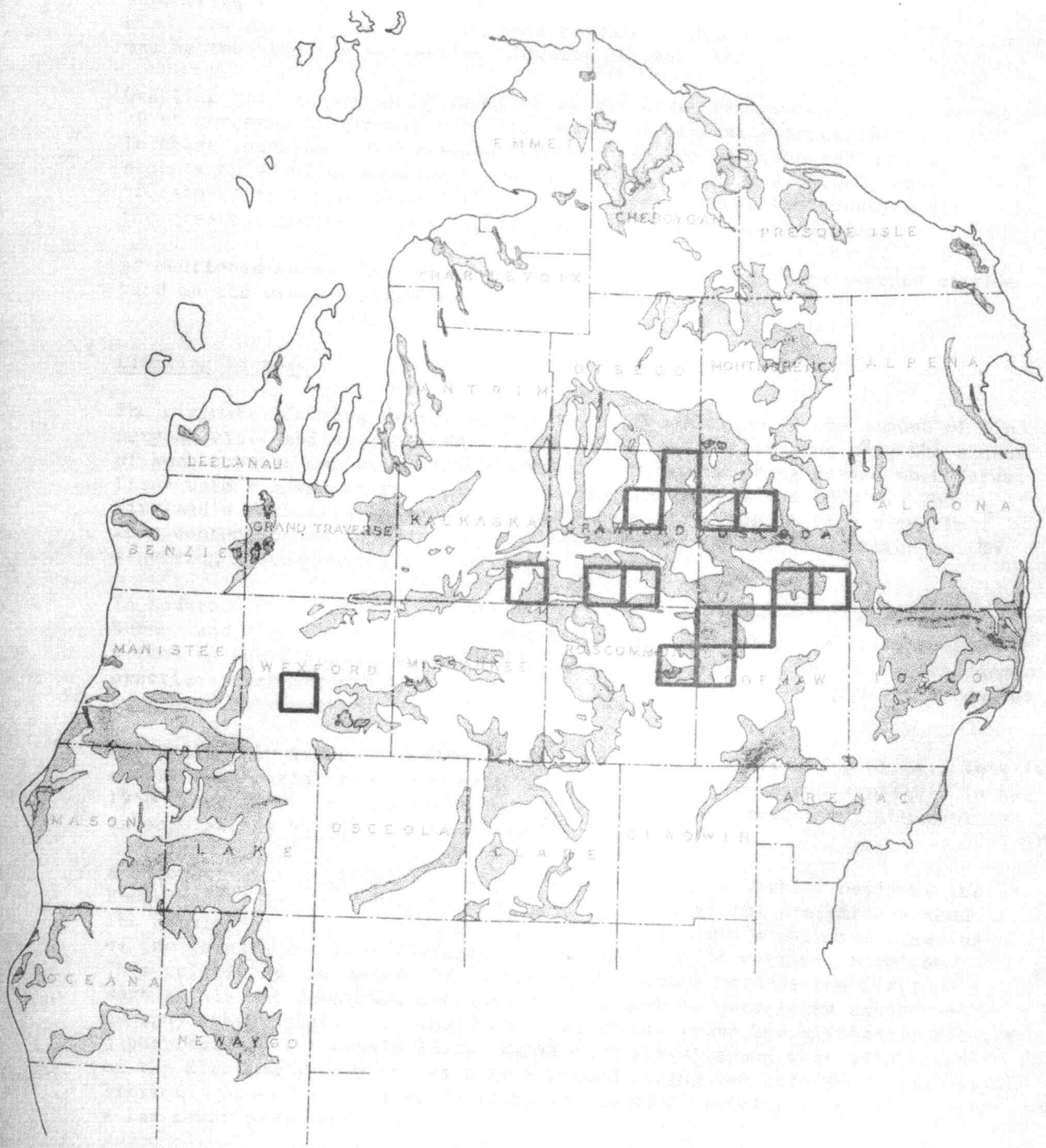



DISTRIBUTION OF GRAYLING SAND TYPE SOIL IN NORTHERN LOWER PENINSULA

1951-1974 TOWNSHIPS WHERE KIRTLAND'S WARBLER WAS KNOWN TO NEST

Figure 2

# CURRENT STATUS OF KIRTLAND'S WARBLER NESTING RANGE




DISTRIBUTION OF GRAYLING SAND TYPE SOIL IN NORTHERN LOWER PENINSULA

1975 TOWNSHIPS WHERE KIRTLAND'S WARBLER WAS KNOWN TO NEST

Kirtland's Warbler nesting habitat is also limited to a specific soil type. With one or two exceptions all nests have been found on Grayling sand soil. This very poor soil is extremely pervious to water. Thus, in addition to supporting the jack pine and the low, sparse gound cover required by the bird, the capacity of Grayling sand to quickly drain during summer downpours may be important in preventing flooding of nests set in the soil.

Grayling sand occurs in 29 counties of the Lower Peninsula, and the amount of it corresponds closely with the amount of naturally occurring jack pine in those counties. For example, Crawford and Oscoda counties have large amounts of Grayling sand soil and have 95,000 acres and 90,000, respectively, of natural jack pine forest (Zimmerman, 1956). These two counties also have the greatest number of nesting Kirtland's Warblers at this time.

As mentioned under "Distribution," the precise habitat requirements of the bird on its wintering ground are not known.

## Limiting Factors

The ultimate limiting factor on the nesting population is the amount of the very special habitat required. There is persuasive evidence that the amount of such habitat was at maximum during the brief lumbering period when forest fires were rampant in the pinelands during the 1880's and 1890's. The Kirtland's Warbler also appears to have been at a peak at that same time. This contention is supported by the large number of specimens taken on the wintering ground during that period.

In modern times, forest fire control has greatly reduced the total acreage burned and also the size of individual burns. Both of these factors have worked to the disadvantage of the Kirtland's Warbler. Also, forest management practices that encourage the conversion of jack pine to red pine or hardwoods have been detrimental.

Currently only 4,000 to 5,000 acres are suitable for breeding birds. This is a very substantial reduction from the 10,000 to 15,000 acres available in the 1950's and 1960's and is probably the most important reason for the decline in populations of the Kirtland's Warbler.

A second limiting factor is parasitism of Kirtland's Warbler nests by the Brown-headed Cowbird, Molothrus ater. This bird of the prairies reached the Kirtland's Warbler nesting range in the late 1800's with the clearing of the forests and the development of agriculture in northern Michigan. This relatively new threat is particularly ominous because the Kirtland's Warbler has not developed defenses against cowbird parasitism exhibited by many other songbirds. Thus, the cowbird has found the Kirtland's Warbler a particularly vulnerable host. Walkinshaw (1972) found that 69 percent of the Kirtland's Warbler nests he examined during the 1966-1971 were parasitized. Other host species nesting in the same vicinity at that time had a far lower parasitism rate.

Cowbird parasitism was reducing Kirtland's Warbler production by at least 40 percent and in some years was almost completely wiping out the warbler's reproductive effort. It appeared almost certain the Kirtland's Warbler population could not endure for long under this extremely heavy burden.

Third, there may be a limiting factor, as yet unidentified, on the wintering ground. Since 1972, about 1,200 warblers have gone south each fall, but only 400 have been found in the census in Michigan the next June. This could indicate that some returning birds cannot find territories because of limited breeding habitat. Also this could indicate that two-thirds of the fall population is lost on the winter range or during migration, but we have no direct evidence of the cause; nor do we know if this is an excessive overwinter mortality rate for this bird. All hypotheses to explain the situation: dry weather, increasing competition for food with other species of warblers, hurricanes and development in the Bahamas seem to be grasping at straws. If a problem exists, perhaps it is temporary or the cause or causes can be determined so corrective action can be taken. An immediate and intensive effort should be made to investigate the ecology of the Kirtland's Warbler during migration and on its winter range.

## Conservation Efforts

In 1957, the Michigan Department of Natural Resources set aside three tracts of four square miles each in each forest lands to be managed for the benefit of the Kirtland's Warbler (Radtke and Byelich, 1963; Mayfield, 1963). In two of them, jack pine was planted in a special arrangement to leave numerous small openings. All have attracted nesting warblers since that time.

At about the same time, the U. S. Forest Service began a study of the problem and in 1961 dedicated a management area of more than 4,000 acres in the Huron National Forest in Oscoda County. Efforts in behalf of the Kirtland's Warbler here have included cutting, burning and planting with the goal of maintaining a portion of the tract in suitable condition for the nesting warbler at all times. The birds have nested here every year, also. Planning is in progress to increase the areas of suitable habitat in the near future.

When the census of 1971 showed such an alarming decrease in the Kirtland's Warbler population, a meeting of all interested groups was held to consider emergency measures to halt and, hopefully, reverse the slide. One outcome of the meeting was a program beginning in the spring of 1972 to reduce cowbird parasitism by trapping and removing cowbirds from the principal nesting areas of the Kirtland's Warbler. The major agency in this effort was the U. S. Fish and Wildlife Service. Other contributors were the Michigan Department of Natural Resources, Michigan Audubon Society and U. S. Forest Service.

Previous research had shown that removal of cowbirds from a nesting area was beneficial to the production of young warblers in nests. The results of systematic cowbird trapping 1972 were an outstanding success. Nesting studies on selected tracts showed virtually no parasitism of warbler nests and an unprecedented yield of young warblers per pair of adults.

In 1973 and 1974 the cowbird control program was expanded to more effectively cover the nesting areas. Now, virtually all nesting areas of the Kirtland's Warbler receive cowbird control. In the nesting seasons of 1973 and 1974, the monitoring studies of nesting birds showed continuing effectivenss in restoring the reproductive capability of the species to what it must have been before the cowbird arrived (Mayfield, 1975; Shake and Mattsson, 1975; Walkinshaw and Faust, 1974 and 1975; Orr, 1975).

Thus, the program to increase Kirtland's Warbler production by reducing cowbird parasitism has been an unqualified success. However, it has not, as yet, caused a substantial increase in the spring population. It appears that the downward slide has been checked and the increase of 12 pairs from 1974 and 1975 may be the first sign of an upward trend. The results of the 1976 census may give additional assurance that the Kirtland's warbler can ultimately be restored to a non-endangered status.

PART II

THE RECOVERY PLAN

## Objectives and Rationale

The first objective of Kirtland's Warbler management is to reverse the downward trend of the population. This is our greatest concern for the next 8 to 10 years. It is urgent because existing birds are at a very low level and they are the only source of stock we can draw upon to occupy new habitat as it develops. From this beginning it is our ultimate goal to develop enough breeding range habitat to support a stable wild population of 1,000 pairs. The Recovery Team recognizes this is a great increase over the present population of 179 pairs. We feel, however, that it is a realistic goal, and it can be reached if the breeding range is the principal limiting factor in their growth. The Team believes it is the most important known limiting factor.

The most recent survey shows that active and potential Kirtland's Warbler summer habitat is relatively limited. Jack pine cover with potential to provide the known nesting requirements occupies about 135,000 acres. This area includes all of the best sites on state and national forest lands. An additional several thousand acres of privately owned lands could have a potential for supporting the species but are not included in the total. At this time, the public lands offer the best, and perhaps only, opportunity for a successful management program. Even though acreage available for summer range development is limited, it is quite adequate to support our ultimate goal of 1,000 pairs.

In an intensively managed forest the land manager has a number of options available concerning the distribution and size of harvest, the tree species to favor and the schedule of harvesting. All of these management options can directly affect the habitat of the Kirtland's Warbler. Commercial harvest, special plantings, various stand treatment techniques, together with direct wildlife habitat management for the warbler, offer the most realistic means of attempting to meet the objectives of the Recovery Plan. A coordinated timber-wildlife management plan can achieve the desired nesting habitat objective of the Recovery Plan. This plan will also provide a continuous supply of forests products.

## Recommendation

In order to reverse a population trend leading to extinction, the Recovery Team strongly recommends that 135,000 acres be designated for management of the Kirtland's Warbler. This is necessary to develop and maintain between 36,000 to 40,000 acres of habitat active and productive at all times.

By sustaining the amount of acreage through a planned rotation, an adequate amount of nesting habitat will be provided to maintain a secure Kirtland's Warbler population. This will be most feasibly accomplished through carrying the jack pine to a commercial rotation age.

# KIRTLAND'S WARBLER RECOVERY PLAN OUTLINE

PRIMARY OBJECTIVE: REESTABLISH A SELF-SUSTAINING WILD KIRTLAND'S WARBLER POPULATION THROUGHOUT ITS KNOWN FORMER RANGE AT A MINIMUM LEVEL OF 1,000 PAIRS.

1. MAINTAIN AND DEVELOP SUITABLE NESTING HABITAT FOR THE KIRTLAND'S WARBLER THROUGHOUT ITS FORMER KNOWN RANGE.

1.1 Determine total acreage suitable for managing for Kirtland's Warbler nesting habitat.

1.11 Prepare maps of suitable areas on Grayling soils by size class and density.

1.111 Locate areas of potential habitat on public lands with use of vegetation and soil maps. Field check data.

1.112 Locate areas of potential habitat on private lands with use of soil maps and air photos. Field check data.

1.2 Protect, improve and where possible, expand areas that are now or will become usable within 7 years by Kirtland's Warbler.

1.21 Protect existing nesting habitat.

1.211 Fire control.

1.212 Insect and disease control.

1.22 Develop habitat potential of existing jack pine reproduction, particularly those areas adjacent to or within occupied habitat.

1.221 Spot burning.

1.222 Create openings in dense stands.

1.223 Sanitation treatments in reproduction (remove oak sprouts, etc.)

1.224 Overstory removal.

1.23 Provide informational services for:

a. Public review and comment.
b. Public acceptance.

1.3 Provide nesting habitat for 1,000 breeding pairs of Kirtland's Warbler. Incorporate into forest management plans on public lands the management of 120 - 135,000 acres of jack pine for Kirtland's Warbler. Provide 36 - 40,000 acres of suitable habitat on a sustained basis. Achieve goal by 1990.

1.31 Utilize commercial logging where feasible (clearcuts or seed trees) to create suitable habitat.

1.311 Cut and prescribe burn; followed by:

a. Natural regeneration
b. Seeding
c. Planting

1.312 Mechanical treatment with seeding or planting where burning is not feasible.

1.311-1 and 1.312-1 Undertake sanitation treatment of stands, if needed.

1.32 Undertake non-commercial treatments where desirable.

1.321 Treat non-merchantable stands (prescribed burning, cutting, etc.).

1.322 Rehabilitation of burns (wildfire).

1.323 Rehabilitation of previously cut or burned areas not adequately regenerated.

1.33 Provide information service for:

a. Public review and comment.
b. Public acceptance.

1.331 Prepare Environmental Impact Assessment and, if required, Environmental Impact Statement.

1.4 Manage suitable jack pine stands on private lands, where feasible, utilizing the same techniques as for public land; or acquire key tracts.

1.41 Purchase or lease key tracts for habitat management.

1.411 Acquire key tracts usting state endangered species funding.

1.412 Acquire key tracts using Land and Water Conservation Funds.

1.42 Develop a cooperative program with private landowners to manage Kirtland's Warbler habitat.

1.421 Provide technical services.

1.422 Provide financial aid.

1.423 Offer tax incentives.

1.424 Direct habitat work on private lands with State-owned equipment and manpower.

1.43 Provide information service for:

a. Informing public of programs available.
b. Informing public of management needs on private lands.

1.5 Meet research needs and habitat evaluation.

1.51 Evaluate the results of habitat management.

1.511 Identify stocked areas and areas needing planting and sanitation.

1.511-1 Make stocking surveys of treated areas.

1.52 Improve cultural treatments for habitat development.

1.521 Develop improved guidelines for cultural treatments to produce better plant communities most productive as nesting habitat.

1.521-1 Refine knowledge of soil and vegetative structures of Kirtland's Warbler nesting habitat.

2. PROTECT THE KIRTLAND'S ON ITS WINTERING GROUNDS AND ALONG THE MIGRATION ROUTE.

2.1 Provide and protect adequate wintering habitat to support the nesting populations (Bahama Islands).

2.11 Locate and monitor wintering populations to determine mortality factors and identify habitat.

2.111 Evaluate and follow-up reliable sightings on the wintering grounds.

2.111-1 Develop system for reporting sightings of Kirtland's Warbler on wintering grounds.

2.112 Develop inventory techniques, including radio telemetry, to inventory the wintering population.

2.113 Establish a cooperative winter survey for the Kirtland's Warbler.

2.12 Protect the Kirtland's Warbler and its critical wintering areas.

2.121 Establish cooperative programs with other countries to protect critical wintering habitat of the Kirtland's Warbler.

2.121-1 Develop cooperative programs with foreign countries and International conservation organizations, such as the World Wildlife Fund, to protect the Kirtland's Warbler and its wintering habitat.

2.121-2 Establish a cooperative agreement between National Audubon Society and Bahamas National Trust to protect the Kirtland's Warbler and its habitat.

2.122 Delineate critical wintering habitat.

2.123 Identify and monitor land use changes on known wintering grounds.

2.123-1 Classify and map the vegetation of known historical wintering areas.

2.123-2 Map the broad vegetation zones of the Bahamas using ERTS or high level photos.

2.124 Reduce mortality on wintering grounds.

2.124-1 Determine factors affecting wintering mortality of the Kirtland's Warbler.

2.2 Protect the Kirtland's Warbler during migration.

2.21 Protect key habitat components along the migration route.

2.211 Define the migration route of the Kirtland's Warbler.

2.211-1 Establish procedure to accumulate and verify sighting records of Kirtland's Warbler during migration.

2.211-2 Initiate research program (radio telemetry) to determine migration route.

2.22 Eliminate or reduce adverse environmental factors during migration.

2.221 Determine hazards adverse to Kirtland's Warbler during migration. Monitor major weather conditions.

2.222 Monitor pesticide levels along known migration routes.

3. REDUCE KEY FACTORS ADVERSELY AFFECTING REPRODUCTION AND SURVIVAL OF KIRTLAND'S WARBLER.

3.1 Control human activities which may be detrimental to Kirtland's Warbler population.

3.11 Provide an Information and Education Program for protection on the breeding and winter range and during migration.

3.111 Publish notice of land closures and all other public restrictions in all news media.

3.112 Provide informational material on protection.

3.112-1 Printed material.

3.112-2 Audio visual programs.

3.112-3 Film and photo library to meet public demands.

3.113 Provide visitor informational program at the field level.

3.113-1 Conduct guided tours on pre-selected routes.

3.113-2 Provide other public informational programs (talks, displays, etc.).

3.12 Provide protection of the Kirtland's Warbler and its breeding habitat.

3.121 Protect occupied nesting areas.

3.121-1 Close State and National forest lands from May 1 - August 15.

3.121-11 Post and enforce regulations on closed lands.

3.121-2 Encourage cooperative agreement in closure of private lands to conflicting uses.

3.121-21 Post and enforce regulations on closed lands.

3.121-3 Regulate Michigan National Guard use of nesting areas.

3.121-31 Revise Cooperative Agreements between public agencies involved.

3.122 Eliminate taking of the Kirtland's Warbler as defined in Public Law 93-205.

3.122-1 Post and enforce regulations.

3.122-2 Develop guidelines on activities which may adversely affect the Kirtland's Warbler, including pesticide use.

3.132 Coordinate all land use plans and policies involving critical habitat.

3.2 Control factors other than man which adversely affect the Kirtland's Warbler.

3.21 Reduce all predators and parasites adversely affecting Kirtland's Warbler production.

3.211 Control avian predators and parasites on selected critical habitat.

3.211-1 Monitor effects of cowbird removal on Kirtland's Warbler nesting success.

3.211-11 Trap and remove cowbirds.

3.211-2 Transport bluejays, captured in cowbird traps, to areas where they will not adversely affect Kirtland's Warblers.

3.211-3 Determine if avian predators adversely affect Kirtland's Warblers on the breeding range.

3.212 Reduce stresses caused by animals other than birds to a level that will not adversely affect Kirtland's Warbler nesting success.

3.212-1 Determine what other animals are adversely affecting Kirtland's Warblers' nesting success.

3.22 Identify habitat modifications which will reduce parasitism and predation on Kirtland's Warblers.

4. MONITOR BREEDING POPULATIONS OF THE KIRTLAND'S WARBLER TO EVALUATE RESPONSES TO MANAGEMENT PRACTICES AND ENVIRONMENTAL CHANGES.

4.1 Determine overall population level on nesting range by counting singing males annually.

4.11 Evaluate census data, prepare reports.

4.111 Conduct surveys.

4.111-1 Develop census procedures and establish time schedules.

4.111-2 Recruit, train and assign personnel.

4.111-3 Prepare report forms and instructions.

5. REINTRODUCE KIRTLAND'S WARBLERS INTO AREAS IN THE UPPER PENINSULA OF MICHIGAN OR IN OTHER STATES IN AN ATTEMPT TO ESTABLISH INDEPENDENT SELF-SUFFICIENT POPULATIONS.

5.1 Implement research to develop reintroduction methods to establish an independent population of Kirtland's Warblers, using a species of similar nesting behavior.

5.2 Monitor production of fledged Kirtland's Warblers and return of yearlings.

5.21 Transport Kirtland's Warbler eggs and substitute for eggs of host.

5.211 Monitor Kirtland's Warbler nests for a source of supply of eggs.

5.212 Concurrently, monitor host species' nests in reintroduction areas to select potential foster parents.

5.213 Determine location of suitable habitat, preferably centering on lands in public ownership.

## NESTING HABITAT MANAGEMENT

Kirtland's Warbler habitat management can be divided into short term (next 7 years) or emergency objectives and into long term (beyond 7 years) objectives. The short term objectives are to maintain, improve and expand areas that are now providing or have the potential to provide suitable nesting habitat during the critical period between now and 1982. Hopefully, this emergency effort will help to arrest the downward slide of the population and even provide for some immediate improvement. The long term objective is to generate new Kirtland's Warbler nesting habitat that will eventually provide for a minimum of 1,000 pairs on a sustained basis.

### Short Term Objectives

The first step will be to determine, by location and condition, the total acreage of potential Kirtland's Warbler breeding habitat in northeastern Lower Michigan. This will require the identification of jack pine forest types on Grayling sand soils and the selection of those stands which can be grouped into manageable units (320 acres or more preferred). First priority will be directed to areas that are now providing, or were formerly known to provide warbler breeding habitat. This basic inventory and selection of areas for habitat management will be done by the U. S. Forest Service and the Michigan Department of Natural Resources on the public lands under their respective jurisdictions, and these agencies will share the task for private lands.

On public lands, areas of potential breeding habitat will be located by the use of existing vegetation and soils maps and aerial photographs followed by field examinations. New aerial photographs of specific areas will be taken, if necessary.

Potential areas for breeding habitat development on private lands will be identified from existing soils maps and new aerial photographs which will be obtained as in above paragraph.

Maps will be prepared showing jack pine stands on Grayling sand soils by size and density classes.

From these maps the total acreage of manageable units of jack pine with potential for Kirtland's Warbler habitat will be computed and classified by land ownership.

### Emergency Measures

The first (emergency) priority for habitat management is to protect, improve and, where possible, expand all areas of breeding habitat of manageable size that are now used, or will become usable within 7 years by Kirtland's

Warblers. The USFS and the DNR will modify existing forest management plans to incorporate these emergency measures, and these agencies will jointly develop a similar plan for private land.

Habitat Protection

Every possible effort will be made to insure maximum potential of presently occupied breeding habitat by protecting it from destruction or degradation.

Fire management plans will call for the vigorous suppression of wildfires which threaten to burn over presently occupied breeding habitat and areas that will become usable in seven years. (As additional breeding habitat comes into production, and if the Kirtland's Warbler populations respond favorably, this practice may be modified in order to use wildfire management as a habitat development tool.)

Insects and diseases which may threaten occupied breeding habitat will be controlled, if the control can be effected without adverse influence to the breeding population either directly or indirectly.

All developments such as campgrounds, ORV trails, highways, etc., will be banned in and near occupied breeding habitat on public lands and vigorously discouraged on private lands.

Habitat Improvement

The breeding habitat potential of existing stands of jack pine will be fully developed, particularly those adjacent to or within occupied habitat. This work will be done during fall and winter to avoid harassment of breeding warblers.

Small openings will be created where necessary and suitable ground level vegetation encouraged by spot burning. Sanitation treatments will be made to remove or eradicate oak stump sprouts, or other unwanted hardwood trees and sprouts. Overstory pines or hardwoods will be removed or eradicated.

An information program will be developed to allow public review and input and public acceptance of the emergency habitat program. A similar effort should also be made to increase awareness and acceptance of the program within the involved agencies. (It is not expected that this phase of the habitat program will become highly controversial since relatively small acreage is involved.)

Long Term Objectives

Using the data obtained from the inventory of potential Kirtland's Warbler breeding habitat, the USFS and DNR will select and incorporate into their forest management plans 135,000 acres. The goal is to reach 36,000 to 40,000 acres of suitable nesting habitat by 1990, which will support and sustain a breeding population of 1,000 pairs. To reach this goal,

approximately 3,500 acres of suitable jack pine would be regenerated annually for the next seven years, and then 2,800 acres per year on a sustained basis. (This time frame will be modified in either direction, if necessary to keep pace with the anticipated expansion of the total Kirtland's Warbler population.)

Most jack pine stands that have been identified as essential nesting habitat are to be managed on a 45 to 50 year rotation. These stands will provide nesting habitat between 8 and 21 years of age. The regeneration method will normally involve prescribed burning. The surest and possibly quickest, but most costly method will be to clear-cut, burn and plant seedlings. Another method would be to retain seed trees when stands are cut and burn to prepare the site and release seed for natural regeneration. Where natural regeneration fails, planting will be done. In areas where prescribed burning may not be feasible, mechanical site preparation followed by seeding or planting may be used. This is a silvicultural decision to be determined for each site.

Additional cultural treatments may involve some sanitation treatment to remove excess oak or other deciduous sprouts in regenerated stands. Overly dense stands may be improved by thinning and fully stocked stands may need scattered openings developed. Such treatments should be made before the stand reaches a height of five feet.

Non-commercial treatments will have to be used as the primary tool for Kirtland's warbler habitat regeneration on poor sites, or on areas lacking commercial products because of past history.

Prescribed fire will be the primary tool used to regenerate non-merchantable jack pine stands on poor sites. Areas burned by wildfires will be direct seeded or planted if natural regeneration fails. The removal of "skips" will be accomplished by commercial logging, if possible, and sanitation treatments will be made if needed.

An information program for public input, review and acceptance will be required at an early date as well as inhouse information program to gain acceptance and to facilitate the habitat program within the agencies involved.

Habitat Management Rotation Cycle

The following table is an example of managing 135,000 acres of jack pine stands on a 45 to 50 year rotation (48 year rotation would give an average of regenerating 2,800 acres per year.) A new stand is usually eight years old before warblers start to occupy it. A small number of birds first occupy the site and their numbers increase rapidly the first three or four years. The population then remains fairly constant for nine years and declines rapidly in the next two years. After a stand reaches 22 years of age it is usually past the stage it can support nesting warblers. Jack pine stands on these poor sites will usually reach merchantable size for pulpwood at age 45.

This table is also based on an average population density of one breeding pair per 30 acres during the nine years a stand is in its optimum stage for nesting habitat. Thus, in the last column the estimated population for each year class takes into account a less dense population during establishment and declining habitat stages. The total population objective cannot be achieved until 35,000 acres are in developing and optimum stages. This will necessitate accelerating the development of habitat to regenerate an average 3,500 acres per year over the next 10 years.

Table 1

| Stand Age Years | Acres Available Each Year | Acres/pair | Est. of br. pairs per stand yr. class |
|---|---|---|---|
| 1-7 | | | 0 |
| 8 | 2,800 | 165 | 17 |
| 9 | 2,800 | 83 | 34 |
| 10 | 2,800 | 42 | 67 |
| 11 | 2,800 | 30 | 93 |
| 12 | 2,800 | 30 | 93 |
| 13 | 2,800 | 30 | 93 |
| 14 | 2,800 | 30 | 93 |
| 15 | 2,800 | 30 | 93 |
| 16 | 2,800 | 30 | 93 |
| 17 | 2,800 | 30 | 93 |
| 18 | 2,800 | 30 | 93 |
| 19 | 2,800 | 30 | 93 |
| 20 | 2,800 | 62 | 45 |
| 21 | 2,800 | 127 | 22 |
| 22-48 | (maturing stand--too large for occupation) | | 0 |
| Sub-Totals: | | | |
| 1-7 | 19,600 | - | 0 |
| 8-10 | 8,400 | - | 118 |
| 11-19 | 25,200 | - | 837 |
| 20-21 | 5,600 | - | 67 |
| 22-48 | 75,600 | - | 0 |
| TOTALS | 134,400 | | 1,022 prs. |

Management Evaluation

Since large acreages must be treated to sustain a breeding population of 1,000 pairs of Kirtland's Warblers, an environment impact assessment and possibly an environmental impact statement will be required.

## MIGRATION AND WINTERING CONDITIONS

Little is known of the migration route or wintering grounds of the Kirtland's Warbler. Although this songbird spends approximately four months (May-August) on the nesting range and eight months on its known wintering range in the Bahamas, information about its wintering behavior and habitat requirements is very scanty. It is possible that factors on the wintering grounds at times may tend to limit the population of this species. There has been little change in the habitat in the Bahamas since the 1800's. Survival of the Kirtland's Warbler may depend upon protection of its wintering range, as well as its nesting habitat.

### Wintering Grounds

The wintering grounds of the Kirtland's Warbler were known long before the discovery of its nesting area; yet today, little is known of the wintering habitat of this species, while considerable information is available about the bird's nesting requirements.

Numerous efforts have been made to learn about the wintering habitat of this species with little success. During the late 1800's a number of collectors took specimens of the Kirtland's Warbler in the Bahama Islands (Mayfield, 1960). The first Kirtland's collected was from Andros in 1879 (Mayfield, 1960). The last was taken in 1965 from San Salvador, an island near the southern end of the Bahama chain.

Some 71 museum specimens are known to have been collected from the Bahama Islands. Most (66 of 71) were collected prior to 1900. They include the following islands (from Mayfield, 1960):

| Island | No. Taken | Year |
|---|---|---|
| Andros | 1 | 1879 |
| Berry | 3 | 1891 |
| Caicos | 2 | 1891 |
| Cat | 1 | 1891 |
| Eleuthera | 10 | 1891-97 |
| Great Abaco | 1 | 1891 |
| Great Cay | 2 | 1886 |
| Little Abaco | 1 | 1902 |
| New Providence | 46 | 1884-1915 |
| Watlings | 4 | 1886 |

Radabaugh (1974) summarizes the winter records of known collections and sightings in the Bahamas since 1879.

Van Tyne reported a sighting of a Kirtland's Warbler on Great Inagua sometime during the period 1935-40. Three were seen on New Providence in 1941 (Radabaugh, 1974). In 1949, Van Tyne and Mayfield spent some

57 man-days searching various habitat types on New Providence and Eleuthera without finding the Kirtland's. Since 1959, there have been several sightings on Grand Bahama and two on Eleuthera. Three were sighted on Andros from 1968-1971 by Andrew Paterson (Radabaugh 1974). Radabaugh (1974) stated that, "Dr. Paul Fluck has observed at least five on Grand Bahama since taking up residence there in 1969. Fluck caught two of these in mist nets and banded them."

Radabaugh visited the Bahamas in 1972 and 1973 under a contract with the National Audubon Society to: (1) survey and assess habitat changes; (2) find the Kirtland's and (3) try to determine the warblers' requirements in winter and correlate them with land use changes.

During 800 hours of field work, only one Kirtland's was observed on Crooked Island. Three observations were made with the aid of a tape recorder. "The habitat (of this male) has somewhat the same configuration as do the jack pine--areas on a typical, optimal breeding territory, i.e., there were thickets and openings." (Radabaugh 1974).

Radabaugh reports that the major land use change in the Bahamas has been the cutting of Caribbean pine in three northern islands--Grand Bahama, Great Abaco and Andros during the period 1956 to 1974. Only four islands support Caribbean pine, and extensive logging may have an impact on the Kirtland's. Regeneration has been generally good.

Sightings of the Kirtland's among the Caribbean pine suggest that some portion of the population utilizes this habitat in the winter. Many of the wintering records, however, are from the scrub habitats of the Bahamas--where Caribbean pine does not exist. Even on the "pine islands" many of the Kirtland's collected have been in broad-leaved scrub. Some 24 specimens have been taken on islands which lack pine. Mayfield (1972b) concludes that, "the Kirtland's Warbler usually inhabits low, broad-leaved scrub in the Bahamas..it is significant that no one has reported them in the high scrub or coppice, trees 15 feet or more in height, that abound in these islands."

The Bahama Islands consist of some 700 islands and 2,400 cays and rocks. Only 15 of them have an area of more than 10 square miles. The largest (Andros) is 1,600 square miles. The smallest cannot be ignored because one of the specimens from the last century was taken on Athol near Nassau, which is so small that all parts of it are swept at times by salt spray, stunting the vegetation--and perhaps improving it for the Kirtland's Warbler (Mayfield, 1975).

Very little is known about the ecological changes that may have occurred in the Bahamas in the last century. Most of the settlements are located along the shore, with very few areas developed inland because of poor soil and lack of fresh water. Inagua, the third largest of the islands is 560 square miles in size, but its entire human population and road system is confined to about one square mile.

Although development and pine lumbering have occurred, resort development occupies only a very small portion of some islands. Cutting occurred over a period of some 25 years, with less than five percent of the islands

subject to cutting at any one time. No islands were stripped of all pine. Areas of uncut pine are at least three times the total area of occupied habitat on the nesting grounds. Most of the islands have no pine.

It appears, from the above analysis, that the Kirtland's may utilize several habitats--including the Caribbean pine ecosystem and the broad-leaf scrub areas. To determine the wintering habitat of this species will require extensive surveys. The initial step should be to obtain an accurate vegetative and land use map of the Bahamas. From this intensive survey efforts might better identify the type of habitat used by the Kirtland's. Recent high level photos (E.R.T.S., Satellite and Skylab) can be used to obtain cover and land use data. A survey of this type would then provide the best opportunity for identifying the wintering habitat of the Kirtland's and insuring its future protection.

## Migration

The Kirtland's Warbler leaves its nesting grounds in late August and early September (Fig. 3). Fall migration sightings occur mainly in Ontario, Ohio, the South Atlantic states--the general direction of the Bahama Islands from central Michigan (Mayfield, 1960).

There have been a number of observations during the spring migration. Recent reports include birds from the Lake Erie (Ohio) area and Point Pelee, Ontario. Several early reports (1890's) include reported sightings in Minnesota, Wisconsin, northern Illinois, Indiana and at St. Louis.

Contributing factors to the recent Kirtland's Warbler decline may be drought and hurricanes. Heavy losses among various species of warblers occurred during the spring migration of 1970-1971, due to drought conditions in the Bahamas and southern Florida.

The Kirtland's migrates north and south through the hurricane zone. During the height of migration, such storms might decimate the population, although this is unlikely since migration extends over several weeks

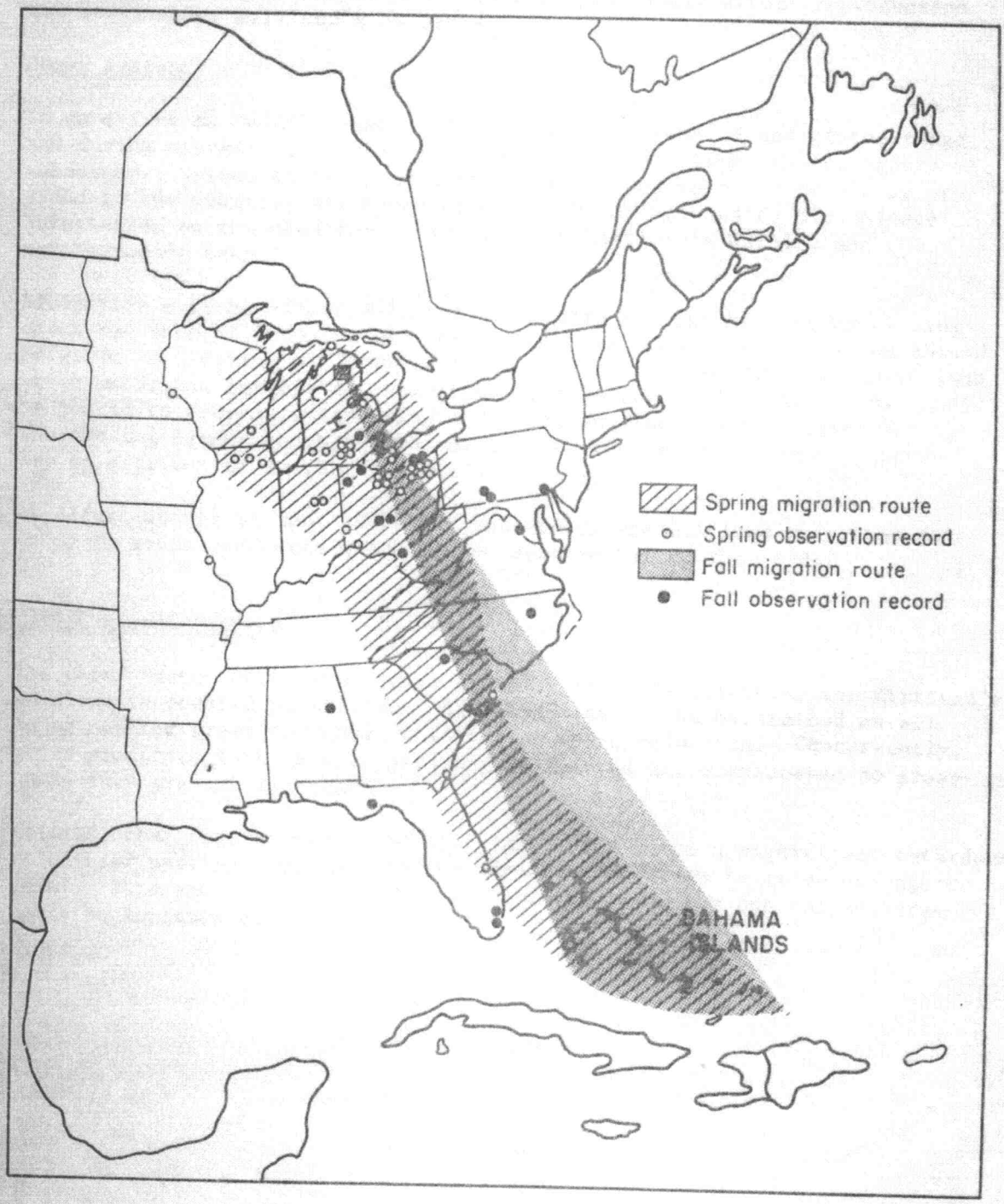
Exposure to pesticides along the migration route may take its toll. In the United States spraying of southern agricultural lands is much more prevalent than on the northern breeding grounds (Mayfield, 1975). However, no known eggshell thinning has been detected or nesting mortality attributed to chemical poisoning.

## Summary

We need to know more about the birds' requirements and behavior during migration and on the wintering grounds. A major aspect of the Recovery Plan will be to initiate surveys and studies to try to locate this birds' wintering grounds and determine its habitat requirements.

Figure 3

KIRTLAND'S WARBLER MIGRATION ROUTE BETWEEN WINTERING AND BREEDING GROUNDS



## BREEDING BIRD CENSUS

Annual monitoring of the breeding population is used to evaluate responses to management practices and environmental changes. Overall population levels on nesting range are determined by counting singing males. Doubling the number of singing males gives a close approximation to the total breeding population. Annual summaries of the census data are provided to planners, administrators, managers and others interested in the status of the species (Tables 2 and 3).

### Methods

Census methods have been developed which combine high accuracy of counting with low disturbance of birds. The timing of counts is attuned to the breeding cycle of the birds. Counts are made by competent workers who are assigned certain areas of the bird's range. This insures complete coverage and avoids duplication.

In 1975, the breeding range was divided into manageable-sized blocks and teams were assigned to each block. Scouting for likely areas was carried out in early June, with the actual census made between June 14 and 22. Since the Kirtland's warbler chooses for its breeding activities a very specific and short-lived niche, it allows crews to rapidly screen large areas when searching for warbler colonies.

The field work of the census program takes 30 people about two days to complete. Personnel are supplied with forms and instructions which describe the proper methods to use. Accurate results and rapid analysis depend on all personnel following the same procedures and using the same report forms.

Table 2

KIRTLAND'S WARBLER

Counts of Singing Males by County

| County | 1951 | 1961 | 1971 | 1972 | 1973 | 1974 | 1975 |
|---|---|---|---|---|---|---|---|
| Crawford | 142 | 52 | 101 | 101 | 114 | 88 | 90 |
| Oscoda | 103 | 152 | 48 | 48 | 47 | 41 | 35 |
| Iosco | 74 | 30 | 1 | | | | |
| Montmorency | 43 | 61 | 1 | | | | |
| Presque Isle | 34 | 34 | | | | | |
| Roscommon | 4 | 13 | | | | 1 | 4 |
| Alcona | 4 | | | | | | |
| Kalkaska | 28 | 32 | | | | | 3 |
| Ogemaw | | 114 | 47 | 49 | 51 | 35 | 46 |
| Otsego | | 14 | 3 | | | | |
| Wexford | | | | 2 | 4 | 2 | 1 |
| TOTAL | 432 | 502 | 201 | 200 | 216 | 167 | 179 |
| Counties | 8 | 9 | 6 | 4 | 4 | 5 | 6 |
| Sections* | 91 | 86 | 27 | 27 | 25 | 27 | 31 |

*Surveyed square miles

Table 3

KIRTLAND'S WARBLER

Counts of Singing Males by Land Ownership
1974 and 1975

| Colony | Year | State | | Federal | | | |
|---|---|---|---|---|---|---|---|
| | | within management areas | outside management areas | within management areas | outside management areas | Private | Total |
| Fletcher Burn | 1974 | - | - | - | - | - | - |
| Kalkaska Co. | 1975 | - | 3 | - | - | - | 3 |
| Lovell's Mgmt. Area & adjacent | 1974 | 23 | - | - | - | - | 23 |
| Crawford Co. | 1975 | 31 | - | - | - | - | 31 |
| Pere Cheney Area | 1974 | - | 2 | - | 13 | 6 | 21 |
| Crawford Co. | 1975 | - | 3 | - | 5 | 1 | 9 |
| Artillery Range | 1974 | - | 44 | - | - | - | 44 |
| Crawford Co. | 1975 | - | 50 | - | - | - | 50 |
| Muskrat Lake Mgt. Area & adjacent | 1974 | 14 | 2 | - | - | - | 16 |
| Oscoda Co. | 1975 | 16 | 5 | - | - | - | 21 |
| Luzerne Burn | 1974 | - | - | - | 6 | - | 6 |
| Oscoda Co. | 1975 | - | - | - | - | - | - |
| Mack Lake Mgmt. Area & adjacent | 1974 | - | - | 19 | - | - | 19 |
| Oscoda Co. | 1975 | - | - | 14 | - | - | 14 |
| Ogemaw Mgmt. Area & adjacent | 1974 | 29 | 2 | - | - | - | 31 |
| Ogemaw Co. | 1975 | 16 | 5 | - | - | - | 21 |
| Misc. areas | 1974 | - | 4 | - | - | - | 4 |
| Ogemaw Co. | 1975 | - | 5 | - | - | - | 5 |
| Damon Burn | 1974 | - | - | - | - | - | - |
| Ogemaw Co. | 1975 | - | 18 | - | - | 2 | 20 |
| St. Helen Burn | 1974 | - | 1 | - | - | - | 1 |
| Roscommon Co. | 1975 | - | 4 | - | - | - | 4 |
| Boon Area | 1974 | - | - | - | 2 | - | 2 |
| Wexford Co. | 1975 | - | - | - | 1 | - | 1 |
| TOTAL | 1974 | 66 | 55 | 19 | 21 | 6 | 167 |
| | 1975 | 63 | 93 | 14 | 6 | 3 | 179 |

With such a small remaining population of Kirtland's warblers, it is possible a catastrophic situation could develop that would lower the world's population of Kirtland's warblers to a level from which they would be unable to recover. Plans should be made to effect a transplant if the population does not properly respond to current management efforts. Research will be initiated with other species of similar nesting behavior.

Large blocks of jack pine habitat on soil types similar to Grayling Sand should be located on cover type maps of the Upper Peninsula of Michigan, and in Wisconsin and Minnesota, and then examined in the field.

Existing field studies to determine current nesting success can be expanded to indicate the best source of supply of eggs.

The nests of potential foster parents can be monitored so that an adequate supply of nests with eggs in the same state of incubation as the warblers would be available.

Clutches of eggs from nesting Kirtland's warblers will be substituted for the eggs of the host species. Renesting of the warblers can be expected. Immediate consideration should be given to develop potential techniques using eggs of a local unendangered species.

The success of development of fledged Kirtland's warblers to a self-sufficient age should be determined.

A follow-up will need to be made the next season to determine if yearling birds return to their reintroduction area or join other warblers in the current Au Sable area breeding grounds.

## PART III

## SCHEDULE OF PRIORITIES, RESPONSIBILITIES, AND COSTS

The environmental requirements for the survival of the warbler are precise. They are so exact that without some manipulation of habitat there is a real possibility that the species could disappear. Much is known about the warbler's breeding habitat requirements, and a great deal can be done to improve the present cover conditions. The situation of this endangered species today leaves us no alternatives. We must apply those treatment techniques which we know will work while there are still enough warblers available to respond to the improved habitat.

From the schedule of priorities, responsibilities and costs the following activities should get immediate consideration. These activities are designed to take advantage of every opportunity to improve conditions for the warblers.

1. Identify, improve, expand and protect the active nesting habitat.

2. Develop detailed plans for expanding suitable nesting habitat.

3. Protect the Kirtland's Warbler on the existing breeding ground from any disturbances during nesting season.

   (a) Post the active breeding range against all trespass without permission.

   (b) Maintain a high nest productivity of Kirtland's Warblers by controlling cowbirds on the nesting grounds.

   (c) Develop and maintain an Information and Education program to keep the people informed on the plight of the Kirtland's Warbler.

   (d) Provide an opportunity for the public to see the species in its habitat through conducted field tours.

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility | | Target Date | Estimated Costs $ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lead | Coop. | | FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond |
| | HABITAT MAINTENANCE AND DEVELOPMENT | | | | | | | | | |
| | 1. Determine total acreage of jack pine stands suitable for managing for Kirtland's Warbler nesting habitat. | 1.11 | FS | | 1978 | 6,000 | 1,000 | 500 | - | - |
| | | | DNR | | | 6,000 | 1,000 | 500 | - | - |
| | | | | FWS | | - | 1,000 | 1,000 | - | - |
| | 2. Select 135,000 acres of publicly owned jack pine having the best potential for managing for Kirtland's Warbler nesting habitat (critical habitat). | 1.1 | FS | | 1977 | 7,500 | 7,500 | 2,500 | - | - |
| | | | DNR | | | 7,500 | 7,500 | 2,500 | - | - |
| | | | | FWS | | - | - | - | - | - |
| | 3. Protect existing jack pine stands that are now occupied or are likely to be occupied in the next 8 years from fire, insects and disease. | 1.21 | FS | | On-going | From existing agency protection funds | | - | - | - |
| | | | DNR | | | | | - | - | - |
| | | | | FWS | | | | - | - | - |
| | 4. Develop habitat potential of existing jack pine reproduction, particularly those areas adjacent to or within occupied habitat. | 1.22 | FS | - | On-going | 3,000 | 10,000 | 10,000 | 5,000 | 5,000/ yr. |
| | | | DNR | | | 4,000 | 10,000 | 10,000 | 5,000 | 5,000/ yr. |
| | 5. Prepare and carry out plans for managing the critical habitat so as to provide 36,000 to 40,000 acres of suitable nesting habitat on a sustained basis. | 1.3 | FS | - | On-going | 30,600 | 30,000 | 45,000 | 50,000 | 50,000/ yr. |
| | | | DNR | | | - | 30,000 | 55,000 | 75,000 | 75,000/ yr. |
| | 6. Prepare environmental impact assessment/statement. | 1.331 | FWS | | 1977 | - | 5,000 | - | - | - |
| | | | | FS DNR | | | | | | |

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility Lead | Responsibility Coop. | Target Date | Estimated Costs $ FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond - |
|---|---|---|---|---|---|---|---|---|---|---|
| | 7. Evaluate the results of habitat improvement through stocking surveys and inventory subsequent work needed. | 1.51 | FS | NCFES | On-going | 500 | 500 | 500 | 600 | 600/ yr. |
| | | | DNR | WL Div. Res. | | - | 500 | 500 | 900 | 900/ yr. |
| | 8. Identify soil and vegetative structures of Kirtland's Warbler nesting habitat. | 1.521 | NCFES | | 1978 | 5,000 | 10,000 | - | - | |
| | 9. Develop a cooperative program for private landowners. | 1.42 | FS | (S & PF) | On-going | - | 2,000 | 4,000 | 4,000 | * |
| | | | DNR | | | - | 3,000 | 6,000 | 6,000 | |
| | | | | SCS | | - | | | | |
| | | | | Ext. S. | | - | | | | |
| | | | | FWS | | - | | | | |
| | | | | Forest Industry | | - | | | | |
| | 10. Purchase or lease key tracts for habitat management. | 1.41 | DNR FS | BOR FWS | On-going | Identify key tracts for purchase or lease. Acquire, when available, through L & WC and other funding. | | | | |

*Ongoing projects funded through Forestry Incentive Programs.

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility | | Target Date | Estimated Costs $ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lead | Coop. | | FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond - |
| | WINTERING GROUNDS AND MIGRATION | | | | | | | | | |
| | 1. Classify and map the vegetative zones of known wintering areas. | 2.123-1 | FWS<br>FS | - | 1978 | -<br>- | 2,500<br>2,500 | 2,500<br>2,500 | -<br>- | -<br>- |
| | 2. Classify and map broad vegetative zones - Bahamas. | 2.123-2 | FWS<br>FS | - | 1977 | -<br>- | 1,000<br>1,000 | -<br>- | -<br>- | -<br>- |
| | 3. Evaluate historical weather records to determine potential effects of major storms on Kirtland's Warbler. | 2.221 | FWS | <br>NOAH | 1977 | -<br>- | 1,000<br>- | -<br>- | -<br>- | -<br>- |
| | 4. Establish cooperative programs with other countries to protect wintering habitat. | 2.121 | FWS | <br>DNR<br>FS<br>NAS | 1977 | - | | | | |
| | 5. Initiate cooperative winter survey to locate Kirtland's Warbler. | 2.113 | FWS | <br>DNR<br>FS<br>NAS | On-going | - | | | | |
| | 6. Establish system for reporting and varifying sightings of Kirtland's Warbler during migration on wintering grounds. | 2.211-1<br>2.111 | FWS | <br>NAS | 1977 | - | | | | |
| | 7. Develop cooperative agreement between U.S. and Bahamas' Govt. to protect wintering habitat. | 2.121 | FWS | <br>DNR | 1978 | - | - | 2,000 | - | - |

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility | | Target Date | Estimated Costs $ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lead | Coop. | | FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond |
| | 8. Identify and monitor land use changes in known wintering grounds. | 2.123 | FWS | FS | On-going | - | - | 5,000 | 3,000 | 3,000/yr. |
| | 9. Monitor major weather patterns covering wintering and migration areas. | 2.221 | FWS | NOAA | On-going | - | - | 500 | 500 | - |
| | 10. Establish cooperative project with World Wildlife Fund and other conservation organizations to support protection of Kirtland's Warbler on its wintering grounds. | 2.121-1 | FWS | Cons. org. | On-going | - | 1,000 | 200 | 200 | 200/yr. |
| | 11. Initiate studies to determine factors affecting wintering mortality of Kirtland's Warbler. | 2.124-1<br>2.11 | FWS | NAS | On-going | -Unknown- | | | | |
| | 12. Initiate research program to determine more precisely the migration route and wintering areas. | 2.211-2<br>2.112 | FWS | Cons. org. | 1979 | - | - | 25,000 | 25,000 | 5,000/yr. |
| | 13. Review status of pesticide levels along migration route. | 2.222 | FWS | - | 1977 | - | 20,000 | 10,000 | 10,000 | - |
| | 14. Delineate critical wintering habitat. | 2.122 | FWS | Cons. org. | 1977 | - | 2,000 | - | - | - |
| | | | | | | - | 1,000 | - | - | - |

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility Lead | Responsibility Coop. | Target Date | Estimated Costs $ FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond - |
|---|---|---|---|---|---|---|---|---|---|---|
| | HUMAN DISTURBANCE | | | | | | | | | |
| | 1. Close State and Federal lands (post and enforce). | 3.121-1<br>3.121-11 | FS | | On-going | 1,400 | 2,000 | 2,000 | 2,000 | 6,000/ yr. |
| | | | DNR | | | 2,000 | 2,000 | 2,000 | 2,000 | 6,000/ yr. |
| | | | | FWS | | - | - | - | | |
| | 2. Cooperative agreement to close private lands. | 3.121-2 | DNR | | Unknown | | 400 | | 400 | 400/ yr. |
| | 3. Coordinate with Michigan National Guard. | 3.121-3 | DNR | | On-going | 500 | 500 | 500 | 500 | 500/ yr. |
| | | | | FWS | | | | | | |
| | 4. Eliminate taking of Kirtland's Warbler as defined in P.L. 93-205. | 3.122 | FWS | - | On-going | 2,000 | 2,000 | 1,000 | 1,000 | 1,000/ yr. |
| | 5. Conduct guided tours. | 3.113-1 | FWS | | On-going | 2,000 | 2,500 | 2,500 | 3,000 | 3,000/ yr. |
| | | | FS | | | 2,000 | 2,500 | 2,500 | 3,000 | 3,000/ yr. |
| | | | | DNR | | 200 | 200 | 200 | 200 | 300/ yr. |
| | | | | MAS | | 1,000 | 1,000 | 1,000 | 1,500 | 1,500/ yr. |
| | 6. Guidelines on activities adversely affecting Kirtland's Warblers. | 3.122-2 | FWS | | On-going | 400 | - | | | |
| | | | | DNR | | 400 | - | | | |
| | | | | FS | | 400 | - | | | |
| | 7. Coordinate all land use plans on critical habitat. | 3.123 | DNR | | On-going | 500 | 500 | 500 | 500 | 500/ yr. |
| | | | FS | | | 500 | 500 | 500 | 500 | 500/ yr. |

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility | | Target Date | Estimated Costs $ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lead | Coop. | | FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond - |
| | PUBLIC RELATIONS | | | | | | | | | |
| | 1. Public land closures and other restrictions. | 3.111 | DNR | | On-going | 250 | 250 | 250 | 250 | 250/ yr. |
| | | | FS | | | 250 | 250 | 250 | 250 | 250/ yr. |
| | | | | FWS | | - | - | - | - | - |
| | 2. Provide informational material on protection - printed, audio visual. | 3.112-1 | FWS | | On-going | 300 | 400 | 600 | 600 | 600/ yr. |
| | | | DNR | | | 300 | 400 | 600 | 600 | 600/ yr. |
| | | | FS | | | 300 | 400 | 600 | 600 | 600/ yr. |
| | 3. Other information programs, talks, etc. | 3.113-2 | FWS | | On-going | 2,000 | 2,000 | 2,000 | 2,000 | 2,000/ yr. |
| | | | DNR | | | 2,000 | 2,000 | 2,000 | 2,000 | 2,000/ yr. |
| | | | FS | | | 1,000 | 1,000 | 1,000 | 1,000 | 1,000/ yr. |
| | 4. Film library. | 3.112-3 | FWS | | On-going | - | 5,000 | 1,000 | 1,000 | 1,000/ yr. |
| | | | DNR | | | | 100 | 100 | 100 | 100/ yr. |
| | 5. Provide information services for public review and reaction. | 1.23 1.33 | DNR | | On-going | - | 2,000 | 2,000 | 2,000 | 2,000 |

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility | | Target Date | Estimated Costs $ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lead | Coop. | | FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyon |
| | FACTORS OTHER THAN MAN | | | | | | | | | |
| | 1. Trap cowbirds. | 3.211-1 | FWS | | On-going | 32,000 | 34,000 | 36,000 | 38,000 | 40,0 yr. |
| | | | | FS | | - | | | | |
| | | | | DNR | | - | | | | |
| | 2. Trap and move bluejays. | 3.211-2 | FWS | | On-going | 1,500 | 2,000 | 2,000 | 2,500 | 3,0 yr |
| | | | | FS | | - | | | | |
| | | | | DNR | | - | | | | |
| | 3. Determine if other avian predators affect Kirtland's Warblers. | 3.211-3 | FWS | | On-going | 300 | 500 | 500 | 500 | 5 |
| | | | | FS | | - | | | | |
| | | | | DNR | | - | | | | |
| | 4. Determine if other animals adversely affect Kirtland's Warbler nesting success. | 3.212-1 | FWS | | On-going | 200 | 500 | 500 | 500 | 5 |
| | | | | FS | | - | | | | |
| | | | | DNR | | - | | | | |
| | 5. Determine effects of cowbird removal. | 3.211-1 | FWS | | On-going | 500 | 1,000 | 1,000 | 1,000 | 1,( yr |
| | | | | FS | | - | | | | |
| | | | | DNR | | - | | | | |
| | 6. Identify habitat modifications to reduce parasitism and predation. | 3.22 | | FS | On-going | - | 2,000 | 2,000 | 2,000 | 2,( yr |
| | | | | DNR | | | | | | |
| | | | | FWS | | | | | | |

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility | | Target Date | Estimated Costs $ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lead | Coop. | | FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond - |
| | MONITOR POPULATIONS TO EVALUATE RESPONSES TO ENVIRONMENTAL CHANGES | | | | | | | | | |
| | 1. Conduct surveys of singing males over total range. | 4.111 | DNR | | On-going | 1,500 | 1,500 | 1,500 | 1,500 | 1,500/ yr. |
| | | | | FS | | 1,000 | 1,000 | 1,000 | 1,000 | 1,000/ yr. |
| | | | | FWS | | 1,000 | 1,000 | 1,000 | 1,000 | 1,000/ yr. |
| | | | | Other (cooperators) | | | | | | |
| | 2. Evaluate census data, prepare reports. | 4.11 | DNR | | On-going | 500 | 500 | 500 | 500 | 500/ yr. |
| | | | | FS | | | | | | |
| | | | | FWS | | | | | | |
| | | | | Other | | | | | | |

SCHEDULE OF PRIORITIES, RESPONSIBILITIES AND COSTS

| Group Priority | Name of Action | Plan Desig. | Responsibility | | Target Date | Estimated Costs $ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Lead | Coop. | | FY 1976 | FY 1977 | FY 1978 | FY 1979 | Beyond |
| | REINTRODUCTION | | | | | | | | | |
| | 1. Implement research to develop reintroduction methods. | 5.1 | FWS | FS<br>DNR | 1977 | - | 10,000 | 7,000 | - | - |
| | 2. Locate suitable habitat. | 5.213 | FWS | FS<br>DNR | Unknown (*) | 4,000<br>-<br>- | - | - | - | - |
| | 3. Monitor Kirtland's Warbler nests for Source of eggs. | 5.211 | FWS | FS<br>DNR | | 1,000<br>-<br>- | 1,000 | 1,000 | - | - |
| | 4. Monitor host species. | 5.212 | FWS | FS<br>DNR | | 2,000<br>-<br>- | 2,000 | 2,000 | - | - |
| | 5. Transport eggs and substitute. | 5.21 | FWS | FS<br>DNR | | 500<br>-<br>- | 500 | 500 | - | - |
| | 6. Monitor production and determine return of yearlings. | 5.2 | FWS | FS<br>DNR | | 1,000<br>-<br>- | 3,000 | 3,000 | 2,000 | - |

*To be initiated if population drops below 100 pairs.

SUMMARY

| | FY '76 | FY '77 | FY '78 | FY '79 |
|---|---|---|---|---|
| Fish and Wildlife Service | 50,700 | 101,900 | 107,300 | 91,300 |
| Forest Service | 54,450 | 64,150 | 75,350 | 70,450 |
| Mich. Dept. of Natural Resources | 25,650 | 62,350 | 84,650 | 97,450 |
| Other (cooperators, etc.) | 6,000 | 11,000 | 1,000 | 1,500 |
| TOTALS | $136,800 | $239,400 | $268,300 | $260,700 |

Costs include all overhead, administration, and supervision.

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------ and W. R. Faust. 1974. Some aspects of Kirtland's Warbler breeding biology. Jack-Pine Warbler. 52:64-75.

------ and W. R. Faust. 1975. 1974 Kirtland's Warbler nesting success in northern Crawford County, Michigan. Jack-Pine Warbler. 53:54-58.

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# APPENDIX B

## ESSENTIAL HABITAT

(1) Description of Essential Habitat

## DESCRIPTION OF ESSENTIAL HABITAT

The Kirtland's Warbler does not adapt to a variety of environmental conditions. Its requirements for breeding habitat are quite specific, so exact that its numbers will probably always be limited. The essence of its habitat is the jack pine forest. For this reason it is often called the Jack Pine Warbler. However, its habitat is more than just jack pine. The bird requires certain exacting conditions for nesting Almost without exception, it is found only in extensive, homogeneous stands of young jack pine located on some of the poorest soil in Michigan--the Grayling Sand.

The plant community attractive to this warbler developed in the past from repeated and extensive forest fires. Historically, wildfires have been the most important factor in the establishment of natural jack pine. These fires played an important role in past survival of the warbler, since under natural conditions suitable habitat was produced only by forest fires. With the advent of fire protection there was a drastic decline of such suitable habitat. Nesting habitat generally consists of young jack pine stands between 5 and 20 feet in height. Dense stands with the pines in close juxtaposition yet interspersed with small openings are best, the pattern which often results from forest fires. Such cover is not attractive to many other species of wildlife, resulting in less competition than might otherwise be expected. A breeding pair of warblers require about 30 acres of this habitat type for its nesting territory.

The low-growing, sparse vegetation that occurs in association with the young Christmas tree-size jack pine on the relatively level sandy outwash plains is an important component of the habitat necessary for the warblers. The delicate combination of required conditions exists for a relatively short period of time, lasting only 10 - 15 years before it is no longer acceptable.

Habitat for the Kirtland's Warbler is considered essential where its destruction, disturbance, modification, or subjection to human activity might be expected to result in a further reduction in numbers of this species, or in a restriction of its potential for expansion or recovery. Essential habitat is defined to mean areas that are presently occupied by nesting pairs, and areas that can be expected to be utilized at some future time. The designation of such potential nesting areas is essential because the birds' occupancy of any tract is temporary, extending through only one early stage of the jack pine growth cycle.

Potential habitat consists of those stands of jack pine that, through management, will provide acceptable habitat at some future date. Such stands can be managed for eventual harvest of the timber resource, with economical harvest at 45-50 years of age. Since the warbler occupies a tract for only about 12 years, within this age span to achieve a stable population of 1,000 pairs will require 36,000 - 40,000 acres of managed habitat at all times. To meet an objective of a sustained supply of

nesting habitat sufficient to support 1,000 pairs will require the designation overall of some 135,000 acres as essential habitat (Fig. 4).

The criteria use for designation of essential habitat include:

1. Soil type - Grayling Sand.

2. Forest cover currently in jack pine, and where management for jack pine is feasible. Areas may contain a limited hardwood (oak) component.

3. Areas currently occupied or previously used by the species.

4. Tracts of about 320 acres or larger, preferably where five or more of them lie within two miles of each other. Tracts less than 320 acres, but not less than 80 acres, where they occur in close proximity to the larger tracts.

5. Lands preferably in public ownership (state or national forests).

6. Limited development potential or where development could be controlled.

7. Relatively level topography.

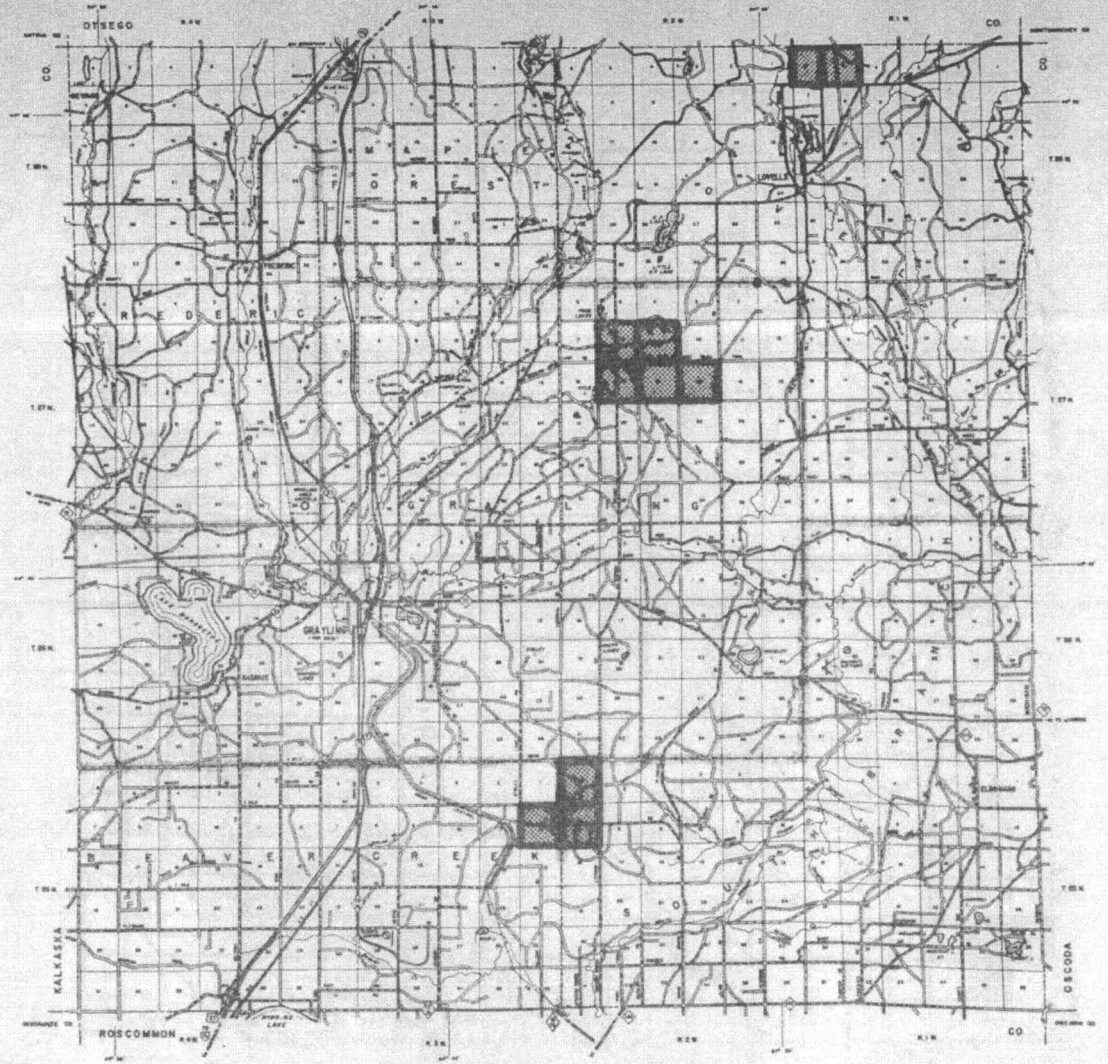
Appendix B deals with the Recovery Team's recommendation for Critical Habitat. As the possibility exists that concurrence of the plan with these recommendations might be construed as concurrence on critical habitat, this section has been deleted. The Team's recommendations for Critical Habitat has been forwarded to the Director of the Fish and Wildlife Service for his consideration but the recommendations will be considered as a separate part of the plan.

Jack E. Hemphill
Regional Director

# APPENDIX C

## 1975 Breeding Range

# 1975 BREEDING RANGE

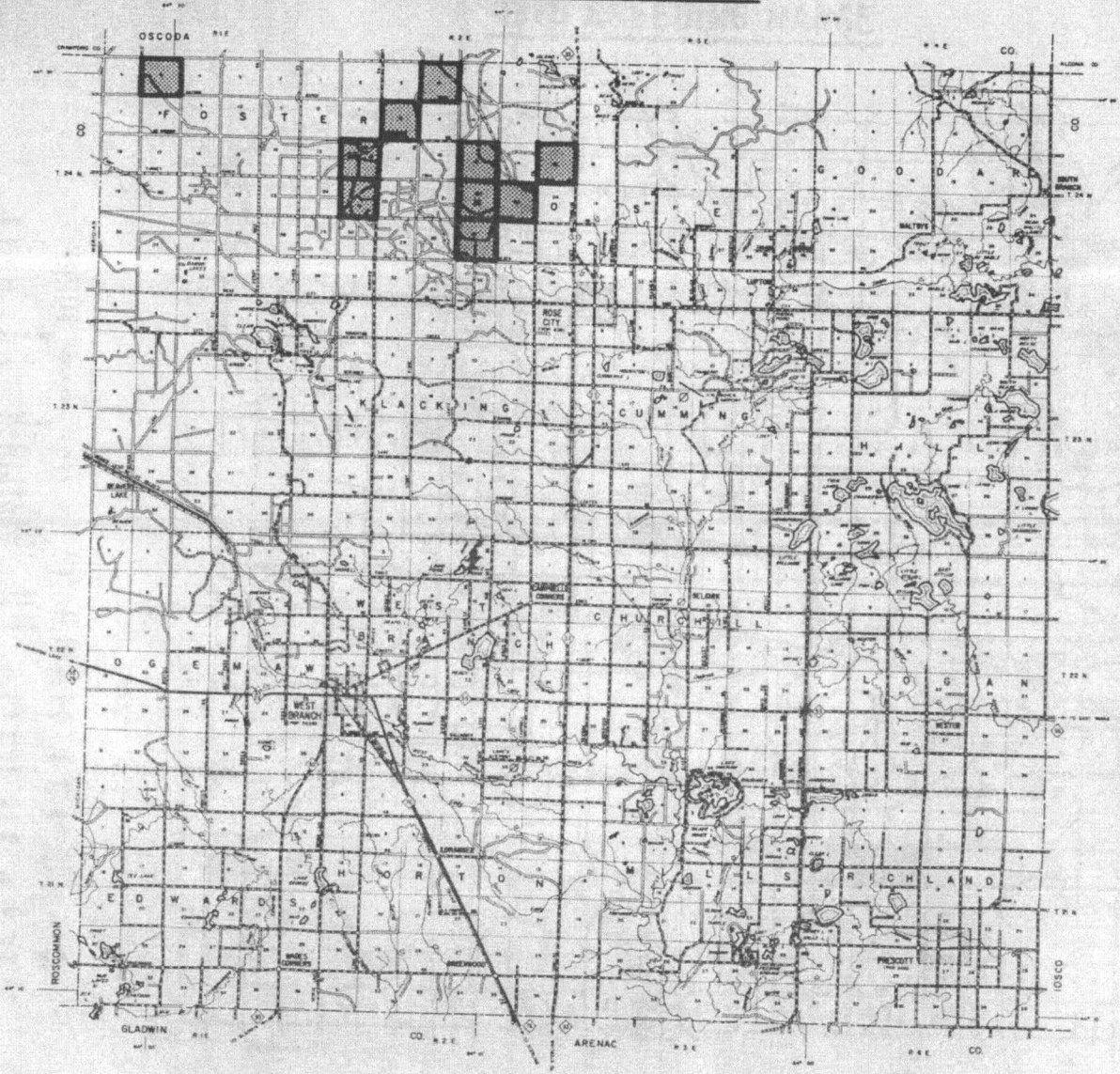


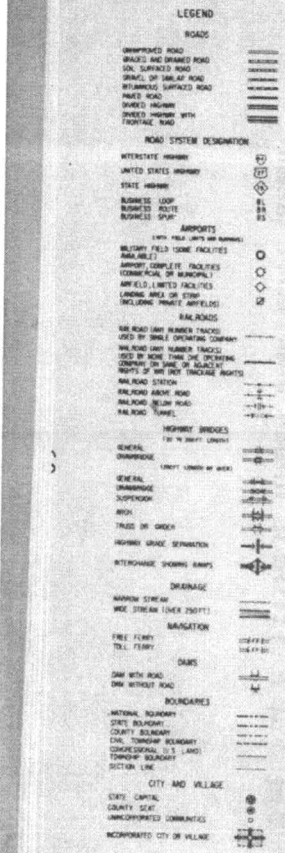

KEY TO COUNTIES

GENERAL HIGHWAY MAP
CRAWFORD COUNTY
MICHIGAN
STATE HIGHWAY COMMISSION
DEPARTMENT OF STATE HIGHWAYS
DATA OBTAINED FROM
HIGHWAY PLANNING SURVEY
PRODUCED IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

Sections occupied by active breeding pairs in 1975

# 1975 BREEDING RANGE





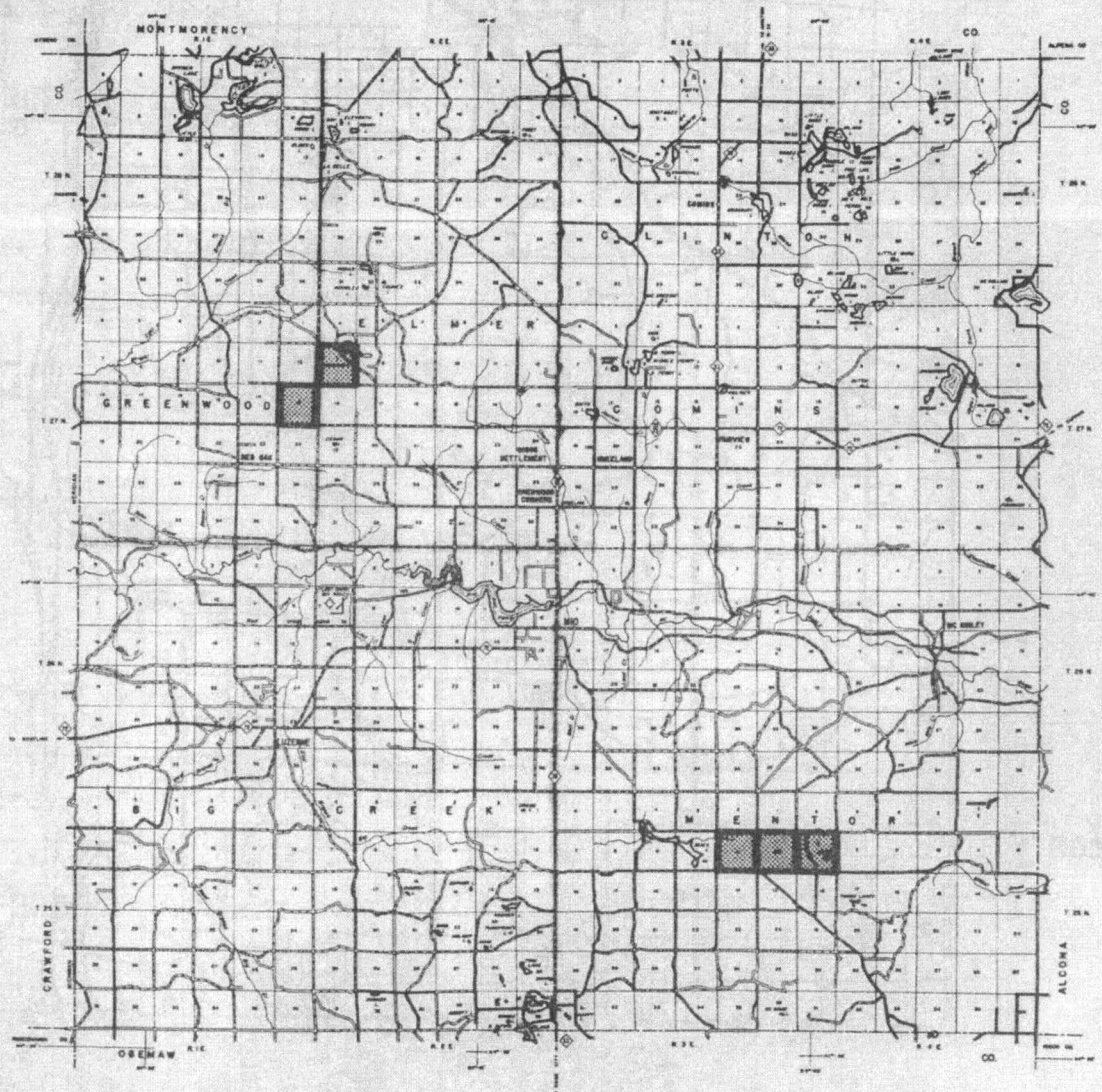
GENERAL HIGHWAY MAP
**OGEMAW COUNTY**
MICHIGAN
STATE HIGHWAY COMMISSION
DEPARTMENT OF STATE HIGHWAYS

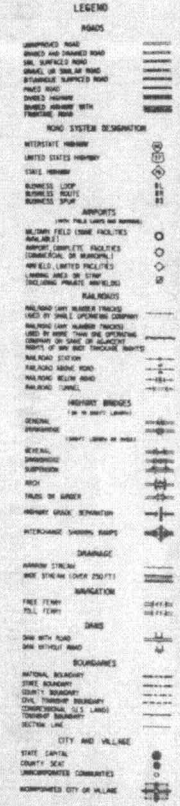
DATA OBTAINED FROM
HIGHWAY PLANNING SURVEY
CONDUCTED IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

SCALE 1" = 2 MILES
1/4" TO MILE
POLYCONIC PROJECTION

Sections occupied by active breeding pairs in 1975

# 1975 BREEDING RANGE



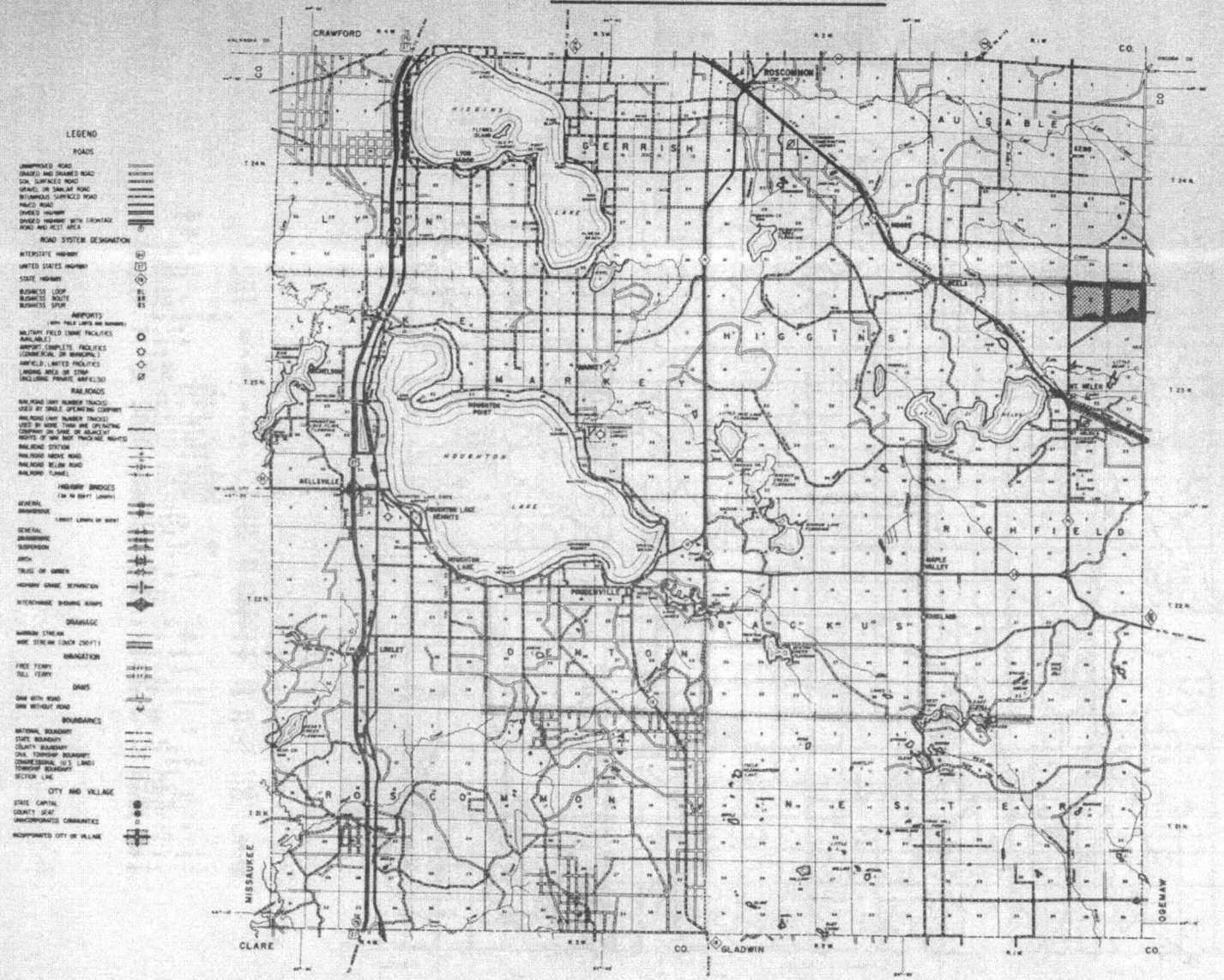





GENERAL HIGHWAY MAP
**OSCODA COUNTY**
MICHIGAN
STATE HIGHWAY COMMISSION
DEPARTMENT OF STATE HIGHWAYS
BASE OBTAINED FROM
HIGHWAY PLANNING SURVEY
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS
1" = 2 MILES

Sections occupied by active breeding pairs in 1975

# 1975 BREEDING RANGE




KEY TO COUNTIES

LEGEND

ROADS

- UNIMPROVED ROAD
- GRADED AND DRAINED ROAD
- SOIL SURFACED ROAD
- GRAVEL OR SIMILAR ROAD
- BITUMINOUS SURFACED ROAD
- PAVED ROAD
- DIVIDED HIGHWAY
- DIVIDED HIGHWAY WITH FRONTAGE ROAD AND REST AREA

ROAD SYSTEM DESIGNATION

- INTERSTATE HIGHWAY
- UNITED STATES HIGHWAY
- STATE HIGHWAY
- BUSINESS LOOP
- BUSINESS ROUTE
- BUSINESS SPUR

AIRPORTS

- MILITARY FIELD (SOME FACILITIES AVAILABLE)
- AIRPORT, COMPLETE FACILITIES (COMMERCIAL OR MUNICIPAL)
- AIRFIELD, LIMITED FACILITIES (LANDING AREA OR STRIP)
- (INCLUDING PRIVATE AIRFIELDS)

RAILROADS

- RAILROAD (ANY NUMBER TRACKS) USED BY SINGLE OPERATING COMPANY
- RAILROAD (ANY NUMBER TRACKS) USED BY MORE THAN ONE OPERATING COMPANY ON SAME OR ADJACENT RIGHTS OF WAY (NOT TRACKAGE RIGHTS)
- RAILROAD STATION
- RAILROAD ABOVE ROAD
- RAILROAD BELOW ROAD
- RAILROAD TUNNEL

HIGHWAY BRIDGES

- GENERAL
- DRAWBRIDGE
- SUSPENSION
- ARCH
- TRUSS OR GIRDER
- HIGHWAY GRADE SEPARATION
- INTERCHANGE SHOWING RAMPS

DRAINAGE

- MARSH STREAM
- WIDE STREAM (OVER 250 FT.)

IRRIGATION

- FREE FERRY
- TOLL FERRY

DAMS

- DAM WITH ROAD
- DAM WITHOUT ROAD

BOUNDARIES

- NATIONAL BOUNDARY
- STATE BOUNDARY
- COUNTY BOUNDARY
- CIVIL TOWNSHIP BOUNDARY
- CONGRESSIONAL (U.S. LAND) TOWNSHIP BOUNDARY
- SECTION LINE

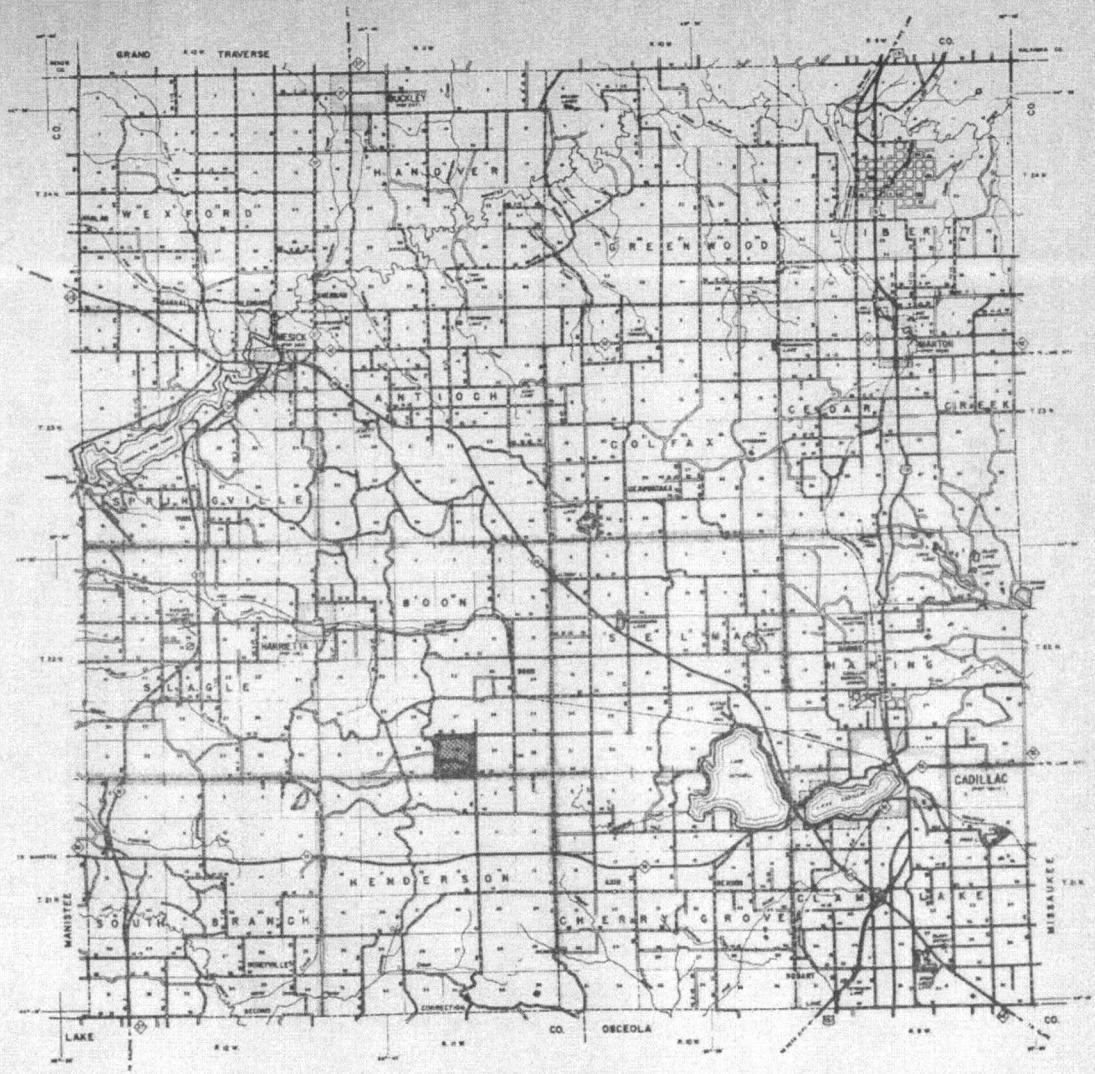
CITY AND VILLAGE

- STATE CAPITAL
- COUNTY SEAT
- UNINCORPORATED COMMUNITIES
- INCORPORATED CITY OR VILLAGE

GENERAL HIGHWAY MAP
ROSCOMMON COUNTY
MICHIGAN
STATE HIGHWAY COMMISSION
DEPARTMENT OF STATE HIGHWAYS
DATA OBTAINED FROM
HIGHWAY PLANNING SURVEY
CONDUCTED IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS
1" = 2.75 MILES

Sections occupied by active breeding pairs in 1975

# 1975 BREEDING RANGE




Sections occupied by active breeding pairs in 1975

LEGEND

ROAD SYSTEM DESIGNATION

AIRPORTS

RAILROADS

HIGHWAY BRACKETS

BOUNDARIES

CITY AND VILLAGE

GENERAL HIGHWAY
WEXFORD COU
MICHIGAN
STATE HIGHWAY COMMISS
DEPARTMENT OF STATE HIGH
HIGHWAY PLANNING SUR
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
BUREAU OF PUBLIC ROADS

# APPENDIX D

Letters of Comment

United States Department of the Interior
FISH AND WILDLIFE SERVICE
17 EXECUTIVE PARK DRIVE, N. E.
ATLANTA, GEORGIA 30329

March 12, 1976

Mr. John Byelich, Team Leader
Kirtland's Warbler Recovery Team
Michigan Department of Natural Resources
Wildlife Division
Mason Building
Lansing, Michigan 48926

Dear Mr. Byelich:

We appreciate the opportunity to review the recovery plan for the Kirtland's Warbler. The limited time available for responce precluded thorough circulation and review. Our comments, including some editorial ones, follow. I hope they prove helpful to you.

pp. 3-4 - These figures fail to point out the relationship between soil type, jack pine and nesting. I assume part of the reason is that nesting is shown by township and, thus, does not show the specific nest locations. However, the fact that some townships containing an abundance of the Grayling sand soil and no nests and other townships show nesting but little or no Grayling soil (Wexford) seems to conflict with the stated relationship. Why are there no nests in certain counties containing abundant Grayling soil, i.e., Lake County for example? Is jack pine present on these soils? We suggest that some thought be given to improving visual representation of the relationship between nesting, soil and pines, perhaps mapping specific locations of nestings. Also, a vegetation type map showing where jack pine occurs would be helpful.

p. 6, 1st sentence, 8th word - Should be "as" instead of "a".

p. 6, 9th sentence, 3rd word - Should be "seems", i.e., plural.

p. 8, 4th paragraph - Unnecessary material already presented in Part I.

p. 10, item 1.22 - "," after reproduction instead of ".".

p. 10, item 1.23 and p. 11, item 1.33 - These items seem out of place here. We suggest a separate primary item or step dealing totally with public relations, information services, and education.

p. 11, item 1.3 - The statement concerning incorporating 100-120,000 acres conflicts with all other references in the plan to 135,000 acres. Also, this sentence (2nd sentence) is meaningless as stands unless the phrase "for Kirtland's Warbler" is added to the end of the sentence. This acreage is probably already incorporated into forest management plans, but for what?

p. 11, item 1.331 - Is this a recovery team function? We have been advised that it is not. If necessary to the plan, who is responsible? It is not addressed in the "Schedule of Priorities, Responsibilities, and Costs".

p.13, item 2.22 - How will this be accomplished? The step-down outline (2.221 and 2.222) indicates that monitoring of adverse factors will be conducted but no provisions are included for eliminating or reducing them.

p. 14, item 3.121-1 - Need to be more specific, it is not necessary to close areas at all seasons since the birds are only present for four months.

p. 15, item 4.1 - At what intervals will this be done, every year?

pp. 16 and 30 - What is the rationale for this method of reintroduction, i.e., placing warbler eggs in nests of other species. This needs to be addressed in the plan. Why not transplant fledglings and/or adults (parents)? Also, will it always be reintroduction? How do you know that the transplant sites once had warblers; will transplants be confined to areas where nesting has been recorded or will suitable habitat elsewhere also be considered?

p. 19, 1st and 7th paragraphs - Conflicting statements are presented, i.e., 1600 acres in paragraph 1 and 2800 acres in paragraph 7 to be regenerated per year.

p. 20, Table 1, sub-totals - 2800 acres should be deleted from Dec. habitat, making a total of 2800 acres and this acreage should be added to Non-hab., bringing this total to 78,400 acres since age 21 represents Non-hab.

p. 21, last paragraph - Superfluous statement needing elimination.

p. 22, 8th sentence, 3rd word - Should be "in" instead of "of".

p. 22, last paragraph - "Van Type" and "Van Tyne" are assumed to be the same person, which is it? Also, these two references, i.e., "Van Type" and "Van Tyne and Mayfield" are not listed in the Literature Cited. If personal communication, need to indicate such.

p. 23, 1st paragraph, 3rd sentence - "Paterson" not listed in Literature Cited.

p. 27, 4th paragraph, last sentence - Incomplete sentence, i.e., "very uncommonly in pine reproduction following timber operations" does not relate to rest of sentence.

p. 32, 4th sentence, 3rd word - "however" is a meaningless word needing elimination since the sentence does not relate to previous sentences.

p. 33, Action #4, 2nd line, 2nd word - Should be "for" instead of "of" to agree with p. 10.

pp. 37, 38, 39 - Headings do not agree with outline. However, we suggest revising the outline to conform with this presentation and include items 1.23 and 1.33 under Public Relations, p. 38.

p. 43 - References Berger and Radabaugh and Walkinshaw and Faust, 1974 are not cited in plan.

p. 46, item 5. - Critical habitat determination should not be confined to public lands, although, admittedly the control over private lands would be little or none under the Act depending upon whether Federal actions or funds were involved. However, critical habitat on private lands would support land acquisition and/or leasing proposals and may also serve to garner support from private individuals to protect and manage for the bird.

p. 48 - Can maps be made a part of the Notice and published in the Federal Register or is legal descriptions necessary. If maps are suitable, would not it be necessary to show exact, instead of approximate, locations in order for the area so designated to hold water in a legal sense?

If we can be of further assistance, please advise.

Sincerely yours,

Harold W Benson

Harold W. Benson
Assistant Regional Director
Federal Assistance

Harold W. Benson
Assistant Regional Director
Federal Assistance
Fish and Wildlife Service
Atlanta, Georgia 30329

p. 3-4 Extensive areas of Grayling sand soils are found throughout the Lower Peninsula (Figure 1). Jack pine exists on these soils, as well as other soil types. Although a highly significant correlation exists between Grayling soils, jack pine and warbler nesting, a number of other factors such as climate and ground vegetation also influence the habitat preferred by the Kirtland's Warbler. This complex interrelationship between soils, vegetation and warbler habitat is not fully understood and requires additional study. This relationship is briefly discussed on page 5.

The Kirtland's Warbler has been found only in a limited number of townships. Present populations (Figure 2) are restricted to remaining areas of suitable habitat.

Specific nest locations have not been shown in Figures 1 and 2. The Recovery Team feels these current nest locations should not be publicized.

Nests within these townships are restricted to Grayling soils, with the exception of one nest located in Wexford County. This nest is located on a "blow out" on Kalkaska sand.

p. 6 1st sent. Corrected

p. 6 9th sent. Corrected

p. 8 4th para. Entire paragraph removed.

p. 10 Item 1.22 corrected.

p. 10 Item 1.23 and Item 1.33 - The information and education portion of the plan is best expressed under the separate categories. Specific information will be distributed by the lead agencies.

p. 11 Item 1.3 corrected.

p. 13 Item 2.22 - The Team does not recognize this as a problem. Item 2.221 change to " ...conditions."

p. 14 Item 3.121-1 Closure dates added.

p. 15 — Item 4.1 corrected.

p. 16-30 — This reintroduction has been established for other species and its implicability to Kirtland's Warbler should be investigated. Modifications have been made in the step down plan.

It was not our intent to design a work plan. A detailed action program is being designed by the U.S. Forest Service and the Michigan Department of Natural Resources based on the general guidelines of the Recovery Plan.

p. 19 — First paragraph - error corrected. Second and third paragraphs rewritten.

p. 20 — Table 1 - error corrected.

p. 20 — Last paragraph error corrected. Refer to a portion of text - stepdown related.

p. 22 — Last paragraph - error corrected.

p. 23 — Paterson citation was in the Radabaugh 1974 report.

p. 27 — The fourth paragraph was deleted.

p. 32 — Corrected as suggested.

p. 33 — #4 changed to read, "Develop habitat potential of existing jack pine reproduction, particularly those areas adjacent to or within occupied habitat."

p. 37, 38, 39 — For headings, we prefer a summary type statement.

p. 43 — Team agreed to delete Berger, et. al. in Literature Cited.

p. 46 — The criteria for the establishment of critical habitat are discussed on pages 45-46. The Recovery Team feels that control of development and use of forest management activities (cutting and prescribed burning) involving large tracts of land (320 acres or larger) can best be achieved on state and federal lands. The Plan (Item 1.4) does recognize the contribution that private lands could make toward the Recovery Plan objective. We plan to seek assistance of private landowners in the management of this species (Item 1.42).

An analysis of public lands has been made to determine suitable habitat. No similar analysis has been made on private lands. A detailed analysis is planned (Items 1.111 and 1.112).

Lands proposed for designation as critical habitat (Appendix B) are sufficient to meet the objectives established by the Recovery Plan. However, there are private lands within or adjacent to areas designated as critical habitat that would compliment habitat management on public lands. Acquisition of private lands is desirable where this will help achieve the Plan's objectives.

A detailed analysis of private lands will determine those tracts that would be desirable for acquisition (or leasing). These tracts can then be considered for acquisition and classified as critical habitat.

p. 48 Detailed map will be filed as part of designation of "critical" habitat. Legal descriptions are not appropriate.

# Wildlife Management Institute

709 Wire Building, 1000 Vermont Ave., N.W., Washington, D.C. 20005 • 202 / 347-1774

DANIEL A. POOLE
*President*
L. R. JAHN
*Vice-President*
L. L. WILLIAMSON
*Secretary*
IRA N. GABRIELSON
*Board Chairman*




March 31, 1976

Mr. John Byelich
Department of Natural Resources
Wildlife Division
Stevens T. Mason Building
Lansing, Michigan 48926

Dear John:

We appreciate the opportunity to examine the draft recovery plan for the Kirtland's warbler. Overall, it is an excellent statement. A few comments are offered below for your consideration.

1. The breeding population goal of 1,000 pairs is for Michigan's breeding range only. Using such a specific goal should be helpful.

2. Waiting to make the transplantation trials until after the Michigan breeding population has reached the minimum level of 100 pairs seem questionable. It would seem far better to complete some trials while there is a larger nucleus population in Michigan. This would provide an opportunity to gain experience while you have a more reasonable population margin to deal with. Of course, the trials should be made only after suitable breeding habitats have been defined in other locations, such as Wisconsin and Minnesota. Candidate sites for evaluation should include the sand plain areas in Minnesota and Central Wisconsin. Military lands may offer potential sites with a reasonable opportunity to carry out the required management.

3. The recovery team should explore the possibility of fitting the management of jack pine for the Kirtland's warbler into a system for producing Christmas trees. There may be an opportunity to market jack pine after their attraction for breeding Kirtland's warblers has declined. By purchasing these trees at that stage citizens would be given an opportunity to contribute to the regeneration of attractive breeding habitat for this warbler. This would require an extension effort to encourage people to use jack pines for Christmas trees. These possibilities did not seem to be explored in any depth in the draft recovery plan.

4. The statement calling for reduction of all predators and parasites effecting the production of Kirtland's warblers adversely needs modification. The bird must be recognized as a part of a biotic community. Most living organisms carry parasites. The goal should be to provide attractive breeding habitat and maintain the Kirtland's warbler population in a healthy situation so that the parasites which are present do not gain dominance and cause excessive mortality. Removal of predators should be evaluated carefully, with attention given only to those considered critical and having an unwarranted depressing influence on the population. A certain degree of predation is normal and should be accepted.

5. The evaluations recommended to determine the characteristics of the wintering range are timely. Those research efforts should be launched as soon as possible.

We appreciate the opportunity to comment on the draft recovery plan and wish you the best of success in completing the final statement. A copy of it would be welcomed and appreciated.

Sincerely yours,

Laurence R. Jahn
Vice-President

LRJ:dt

Laurence R. Jahn
Vice President
Wildlife Management Institute
709 Wire Building
1000 Vermont Ave., N.W.
Washington, D.C. 20005

p. 30 Your point about not waiting for the population to reach 100 pairs before taking action to reintroduce warblers into new areas is well taken. You have the support of several other people on this point. The Team agrees with you and is changing the plan to incorporate your suggestion by giving it immediate effect.

Quest.#3 We would be destroying Kirtland's Warbler habitat at its best, if we harvested Christmas tree-sized trees. Habitat becomes non-productive when it reaches approximately 15 feet. Today, the market for jack pine Christmas trees is almost non-existent. The tree is of such quality that it is not competitive with Scotch pine, Douglas fir, etc. We have structured the entire Plan toward achieving the acreage goal needed through commercial harvest. We feel this is the most feasible approach to achieving our objective.

Quest.#4 We propose to ease up on cowbird control just as soon as their effect on the warbler is no longer considered an endangering factor.

Quest.#5 At the present time, the warblers limited numbers are no match for the unlimited population of cowbirds that occupy the same area. (1) The cowbird is a relatively newcomer to this northern biotic community. (2) It is capable of surviving on a wide variety of habitat conditions,whereas the warbler is limited only to a small part of the cowbird's range.

THE CLEVELAND MUSEUM OF NATURAL HISTORY

WADE OVAL, UNIVERSITY CIRCLE
CLEVELAND, OHIO 44106
(216) 231-4600

April 5, 1976



Mr. John Byelich
Michigan Department of Natural Resources
Wildlife Division
Mason Building
Lansing, Michigan 48926

Dear John:

The following is a reaction to the Kirtland's Warbler Recovery Plan which you recently sent.

Basically, I find the plan very well thought out, carefully documented, and more important than anything else, logical. I agree with all of the steps that are outlined in the plan but I am very concerned about one aspect of the plan, that having to do with reintroduction of the Warbler into other areas. Like others, I do feel that if the population ever drops to a level of one hundred Warblers there should be some kind of drastic steps taken. On the other hand, I know of no study where that which has been outlined in the recovery plan has been attempted with any other species. I feel that it is critical to immediately begin an effort to develop techniques for trying what is proposed in the plan (on page 30) with another species, possible several species, prior to trying this sort of thing with the Kirtland's Warbler. I suggest that it be tried immediately and follow-up studies made in subsequent years so that if this situation does develop where such a technique is necessary for the Kirtland's Warblers there will be prior management techniques developed. Off hand I cannot suggest any species with which this could be done, but I think that there might be several species of the same genus where such possibilities exist. One suggestion I would like to offer is that birds transported from one locality to another be transported to areas where there is some hope of recovering such transported individuals in the future. Quite possibly this could be accomplished by moving eggs of another species of Warbler from an area near where the Kirtland's Warbler presently nests to let us say an island situation where the geography is limited and hence the recovery possibilities are enhanced.

Other than the above, I believe that the report is a very thorough one and I am very hopeful that the efforts that are detailed can be achieved.

With warm, personal regards,

Hal

Dr. Harold D. Mahan
Director

HDM/cjc

Harold Mahan
Cleveland Museum of
Natural History
Wade Oval, University Circle
Cleveland, Ohio 44106

p. 30 Reintroduction - study population before it drops to 100 pairs. We concur it should be done immediately. We have corrected the Plan to conform to your suggestion.

Folwell Ave.
St. Paul, Minn. 55108

2600
March 22, 1976

Mr. John Byelich
Wildlife Division
Mason Building
Lansing, Michigan 48926

Dear Mr. Byelich:

Thank you for the opportunity to review the preliminary draft of the Kirtland's Warbler Recovery Plan. We are impressed with the quality of the information assembled by the team and the effort put forth preparing this document. The following are intended as constructive comments for the team's consideration in developing a revised draft.

Although the specific breeding habitat required by the species and the restricted availability of this resource may be broadly limiting, adequate information is not presented to support the contention that breeding habitat is currently limiting populations (page 8). It would be more convincing if trends in available breeding habitat could be presented or if some other indicators from the species' natural history or biology could be presented to support the contention, i.e. a surplus of nonbreeding birds or other evidence of competition. Forest Survey records do show that the acreage of seedling and sapling stands of jack pine declined in Crawford, Oscoda, Roscommon, Ogema, and Alcona counties in 1966 to 43% of that in 1957, however this may not accurately reflect the trend for suitable habitat. In fact, Walkinshaw (1972) stated, "Since the available suitable habitat, in recent years of decline has, if anything, increased, we cannot blame habitat loss for this situation". Further, in spite of the institution of the cowbird control program in 1972, which dramatically increased the productivity of the population, spring breeding populations remained fairly stable at 190 $\pm$ 25 pairs from 1971-1975. This evidence seems to suggest a failure to return to the breeding grounds rather than the presence of a population of adults unable to find suitable breeding habitat.

There appears to be a basic inconsistency in the state of knowledge portrayed by the draft. The breeding habitat requirements are stated with considerable confidence...giving specific needs as to soil type, stand age, etc. and specific silvicultural techniques are listed. Yet the research needs statement (1.521-1) states a need to ...". Identify soil and vegetative structures of Kirtland's Warbler nesting habitat." While we comprehend the intent, it may not be obvious to the less informed in its present form. What should be conveyed is the need for a refinement of our present knowledge.

In the recovery plan outline, item (3.211-1) states, "Determine effects of cowbird removal on Kirtland's Warbler nesting success." Isn't this already known? Perhaps monitor would be more accurate. Also, item (3.211-2) states, "Trap and transport bluejays to areas where they will not adversely affect Kirtland's Warblers". In general, control measures should be consistent with the goals of warbler production and practiced to the extent necessary to achieve these goals. Control programs directed at species which minimally affect warbler productivity may require considerable effort to achieve only a small increase in productivity; perhaps effort which could be more profitably expended elsewhere in the program. While there is some evidence to indicate that bluejay removal is warranted if captured in conjunction with the cowbird control program, there does not appear to be enough information to indicate that they have enough of an impact on reproductive success to warrant a separate control program. Thus, it should be clarified that the present effort to remove bluejays is being accomplished in conjunction with the cowbird control program. If a separate and more intensive control program for bluejays is being contemplated, the outline should include a statement of a research need to determine the effects of bluejay removal on Kirtland's Warbler nesting success.

Narrative portions of the recovery plan should be restricted to considerations pertinent to the conservation of the species. In this regard, multiple use justification or the connotation thereof, need not be invoked. Statements such as on page 8, "This plan will also provide a continuous supply of forest products and support economic development of the local and state economy.",leaves one with the impression that they were a consideration in the plan. Such consideration is irrelevant and fortuitous. The same could be said for <u>commercial</u> harvests. Unless the audience of the recovery plan dictates otherwise, the emphasis of the plan should be directed to creating and maintaining adequate suitable habitat needed for the perpetuation of the species. Given this goal, the management alternatives to achieve it can be examined. Was this the case or was the suitable habitat required for the perpetuation of the species shaded by commercial harvest considerations as inferred on page 9,... "This seems to be the maximum area possible that can be maintained if we plan to use commercial harvest as the primary tool for habitat development." This consideration could invite considerable criticism if the acreage turns out to be inadequate.

The management options listed on pages 11, and 17-21 appear to be primarily a list of potential silvicultural tools which could be used in treating the landscape to arrive at suitable habitat. Of what real value is this listing in the absence of criteria suggesting in which cases they should be used? Perhaps it is even a bit premature to advocate any prescription unless it is made clear that management actions promoted are really interim guides until a firm scientific basis can be provided.

The creation of large tracts of breeding habitat (320 acres and larger) in close proximity to each other may have the undesirable side effect of increasing the potential for insect and disease epidemics in trees. We recommend that the Recovery Team request an evaluation of Kirtland's Warbler habitat for the current incidence of insects and diseases and the potential for epidemics from the State and Private Forestry branch of the U.S. Forest Service. The person to contact is:

Mr. Robert Anderson
U.S.F.S., State and Private Forestry
Forest Pest Management
Folwell Avenue
St. Paul, Minnesota 55108

Looking to the future, we see an additional area of research which should be investigated concurrent with research on the habitat requirements of the Kirtland's Warbler. From all appearances, cowbird parasitism is a relatively recent problem, one which will require continual vigilance. Although direct cowbird control measures are presently necessary and indeed may even be required in perpetuity to maintain a viable Kirtland's Warbler population, other alternatives should be investigated. Specifically, in conjunction with identifying and refining the habitat requirements of the Kirtland's Warbler, consideration should be given to determining whether it is also possible to concurrently reduce the success of nest parasitism through habitat manipulation, i.e. produce suitable habitat for the Kirtland's Warbler which is acceptably secure from cowbird nest parasitism.

We concur with the role identified in the plan for accomplishment by our Wildlife Habitat Research Unit. Stated in general terms, we currently see our role as refining what is currently known concerning the breeding habitat requirements of the Kirtland's Warbler in specific terms useful in formulating management prescriptions (perhaps including the cowbird aspect), as evaluating the adequacy of management actions in providing suitable habitat, and as providing input on the adequacy of habitat considered in potential reintroduction programs.

We hope these comments will be useful to you in finalizing the recovery plan and look forward to participating with the team in this cooperative effort.

Sincerely,

JOHN H. OHMAN, Director
USDA, Forest Service
North Central Forest Experiment Station

John H. Ohman, Director
USDA, Forest Service
North Central Forest Experiment Station
Folwell Avenue
St. Paul, Minnesota 55108

The statement in the plan regarding limited breeding habitat has been revised.

Your criticism of the plan regarding the lack of evidence to support the contention that breeding habitat is limiting the population is valid, however, we know that currently only 4,000 to 5,000 acres are suitable for breeding birds. This is a very substantial reduction from the 10,000 to 15,000 acres available in the 1950's and 1960's and is probably the most important reason for the decline in the population of Kirtland's Warblers.

While we realize the need for further research, we are faced with an emergency situation of a rapidly declining population. Therefore, we feel it is important that we immediately initiate management practices based on the present status of our knowledge of the species. We have no other choice.

p. 2 First paragraph - We have changed plan step 1.521-1 to read, "Refine knowledge of soils...." We have also changed plan step 3.211-1 to read "Monitor."

p. 2 2nd para. The trapping of cowbirds and blue jays is one operation. We collect cowbirds and blue jays in the same trap.

Blue jays were originally removed from the Kirtland's Warbler nesting area because they were interfering with efficient cowbird trapping operations.

We also recognize that their removal may have some benefit to Kirtland's Warbler nesting success. We have modified the plan to indicate this fact more clearly.

p. 2 Third paragraph - To achieve the goals of the Recovery Plan, the Recovery Team believes that a consistent production of Kirtland's Warbler habitat can be sustained using commercial harvest as the primary tool for habitat improvement. Wood production was not the primary consideration in establishing the <u>objective</u> of the Recovery Plan but was a strong consideration in developing the most realistic approach to achieving this objective.

p. 19 Second and third paragraphs - Most jack pine stands that have been identified as critical nesting habitat are to be managed on a 45 to 50 year rotation. These stands will provide nesting habitat between 8 and 21 years of age. The regeneration method will normally involve prescribed burning. The surest and possibly quickest, but most costly method will be to clearcut, burn and plant seedlings. Another method would be to retain seed trees when stands are cut and burn to prepare the site and release seed for natural regeneration. Where

natural regeneration fails, planting will be done. In areas where prescribed burning may not be feasible, mechanical site preparation followed by seeding or planting may be used.

Additional cultural treatments may involve some sanitation treatment to remove excess oak or other deciduous sprouts in regenerated stands. Overly dense stands may be improved by thinning and fully stocked stands may need scattered openings developed. Such treatments should be made before the stand reaches a height of five feet.

p. 11 First paragraph - The population of the Kirtland's Warbler is fast approaching a level from which it may not recover. The Team feels that we ought to do what we can now. We cannot wait for research to identify the best tools for improvement. We must use existing tools until better ones are identified. The best information in the world is not going to help us after the birds are gone.

p. 1 letter Second paragraph - Thank you for the reference. We will explore this problem.

p. 2 letter First paragraph - The plan has been modified to reflect the need for research to identify habitat modifications that could be made to reduce the impact of predation.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

MIGRATORY BIRD AND HABITAT RESEARCH LABORATORY
LAUREL, MARYLAND 20811

Bi-b-distr

March 23, 1976

RECEIVED
MAR 29 1976
WILDLIFE DIVISION

Mr. John Byelich
Kirtland's Warbler Recovery Team
Wildlife Division
Michigan Department of Natural Resources
Mason Building
Lansing, Michigan 48926

Dear John:

Thanks very much for sending me a copy of the preliminary draft of the Kirtland's Warbler Recovery Plan. Congratulations to you and your team for the excellent progress you have made in summarizing research and management needs for the Kirtland's Warbler. I have just a few suggestions, some of which you probably have already considered.

1. Blue Jay transport. I note that on page 15 under item 3.211-2 you recommend trapping and transporting Blue Jays to areas where they will not adversely affect Kirtland's Warblers. This is a good idea, and I would specify that when feasible the jays be released to the north of where they were captured. This is because I suspect many of the jays that are robbing Kirtland's Warbler nests are late migrants or other non-breeding individuals. In some years we have quite a noticeable Blue Jay migration in Maryland that continues into early June, and in some years migrants are still moving north in late June and early July. If a parallel situation exists in Michigan, any late migrants you might catch would not be likely to return to the area where they were trapped, and by releasing them to the north you would increase the chances of their continuing on their way rather than appearing again at the trap site. If, on the other hand, you learn from banding that some of the jays were on breeding territories and did return to the same spot, you might be justified in taking some action other than transporting them out of the area.

2. Migration map (Figure 3). In order to maximize the likelihood of getting additional reports of Kirtland's Warblers on migration, I recommend you revise Figure 3 so as to include all of the recent records and thus emphasize those localities where the Kirtland's has actually



TELEPHONE—AREA CODE 301 776-4880 (MARYLAND EXCHANGE)
TELEGRAMS—FISH AND WILDLIFE SERVICE, WASHINGTON, D.C. 20240

been recorded rather than simply connect the breeding ground with the wintering ground. I am sure you are familiar, for instance, with the recent record from Rector, Pa.

3. Spring migration sightings. Since most of the records of migrants have been from the spring migration, I would suggest that you include in your plan a campaign to stimulate observers in the migration path to make a concerted effort during the brief migration period to visit areas of suitable habitat in the Carolinas, Virginia, West Virginia, Ohio and southern Michigan in hopes that some migrating individuals can be found and more information obtained on their migration periods, length of stopover and habitat requirements. Since Kirtland's Warblers are said to sing during spring migration and since they probably are fairly specific in their habitat preferences, a brief search at exactly the right time in the right habitat by a large enough corps of interested observers might prove rewarding.

4. Island biogeography. In comparing your maps (Figures 1 and 2) showing the range withdrawal of the Kirtland's Warbler in the last 25 years, I am reminded of The Theory of Island Biogeography by R. H. MacArthur and E. O. Wilson (Princeton University Press, 1967). MacArthur and his associates have documented that species richness increases with island size and decreases with distance from the nearest large land mass. These relationships hold equally well to islands of a particular habitat surrounded by unfavorable land habitat. On isolated habitat islands as well as on isolated islands surrounded by water, the extinction rate of species exceeds the colonization rate so that the number of species that can survive on such an island is smaller than the number on a larger island or one closer to a source of colonists. In this context, it would seem desirable to concentrate your restoration efforts near the center of the Kirtland's Warbler range at first, and then when the population builds up a bit expand into those adjacent areas that are closest and preferably are connected by corridors of suitable habitat. I cannot help but be pessimistic over the future of the single pair that is still nesting in Wexford County.

5. Have you looked into the possibility of using satellite imagery to locate areas of suitable habitat? It is possible to get a printout exactly the same scale as on a 7½-minute topographic map and with 10 characters to the inch horizonally and 8 characters to the inch vertically. These characters are letters or symbols that correspond to various types of land use, such as fields, deciduous woods, conifers, marsh, buildings, open water, etc. We have found these printouts useful in experimental appraisal of habitat types along Breeding Bird Survey routes. They are generally more up to date than aerial photos.

May I suggest a slight change in wording at the top of page 9. I believe it would be preferable to recommend that 135,000 acres be designated for management of the Kirtland's Warbler rather than "set aside," which could be misinterpreted to suggest that that many acres be withdrawn from other productive use.

I wish you the very best of success in your noble efforts to increase the Kirtland's Warbler population.

Sincerely yours,

Chandler S. Robbins

Chandler S. Robbins
Non-Game Project Leader
Migratory Bird and Habitat
Research Laboratory

Chandler S. Robbins
Non-Game Project Leader
Migratory Bird and Habitat
Research Laboratory
Laurel, Maryland 20811

#1 Blue jays are now released to the north of the area trapped. We agree and our banding data supports this. Our current activities are now along this line.

#2 We have revised the migration map as you have suggested.

#3 Step 2.2 and subsequent steps cover your spring migration comments. As yet, detailed plans have not been designed.

#4 Island biogeography -

The Recovery Team concurs with your comment and "The Theory of Island Biogeography." The Kirtland's Warbler has "collapsed" to the center of its range. Detailed work plans are currently being developed to achieve the objectives of the Recovery Plan. Efforts to restore habitat will be concentrated near the center of its range. As populations build up, development of suitable habitat will be expanded into adjacent areas.

The single pair of Kirtland's Warblers in Wexford County is a unique and isolated case, and we are also pessimistic about its survival. This pair is located on an old sand "blow out" which is not typical of adjacent jack pine on Grayling or Kalkaska sand soils.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Washington, D. C. 20250

2630

March 25, 1976

Mr. John Byelich
Michigan Department of Natural Resources
Wildlife Division
S. T. Mason Building
Lansing, Michigan 48926

Dear Mr. Byelich:

We have reviewed the preliminary draft of the recovery plan for the Kirtland's Warbler. Your team has done a fine job with this first effort. Our comments, which follow, are from the technical standpoint only and do not, at this time, imply final Forest Service acceptance of the finished plan.

We believe you need to address these questions:

1. What evidence is there that human activity jeopardizes the species? Can realistic closure be realized at the cost indicated?

2. Have you addressed the question of genetic variability as it relates to potential vigor and survival of the species?

3. Is a better knowledge with eventual control of wintering losses not as important to the recovery effort as management of breeding habitat?

Thank you for an opportunity to comment. We look forward to receiving your final draft.

Sincerely,

MERRILL L. PETOSKEY
Director of Wildlife Management

RECEIVED
MAR 29 1976
WILDLIFE DIVISION



6200-11 (1/69)

Merrill L. Petoskey
Director of Wildlife Management
U.S. Forest Service
Washington, D.C. 20250

Quest.#1 The greatest effect of human disturbance on the Kirtland's Warbler is caused by people walking over the nesting range, seeking out nesting birds to photograph and record their songs. As the number of birds decrease, the public interest increases and disturbance becomes a major factor. Past experience has shown that even mild disturbances have been sufficient to cause nest abandonment. Also in view of the fact that the population is so low we have no choice but to afford maximum protection when quantitative data are not available.

Quest.#2 We do not have time to determine the genetic makeup of the present population. Our immediate concern is to provide for as much breeding habitat as soon as possible and protect the bird from all disturbances.

Quest.#3 It may be that control of the wintering losses are as important as the management of breeding habitat, but the limiting factors that we are aware of are restricted breeding range and parasitism by cowbirds.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Post Office and Courthouse Building
BOSTON, MASSACHUSETTS 02109

MAR 15 1976

Mr. John Byelich
Recovery Team Leader
Michigan Department of Natural Resources
Wildlife Division
Mason Building
Lansing, MI 48926

Dear Mr. Byelich:

Thank you for the opportunity to review the draft recovery plan for the Kirtland's Warbler. Our comments follow:

1. Page 27 - Do you also plan to assess productivity in addition to conducting the breeding bird surveys? Perhaps you have considered this already because we notice you have determined that 1,200 warblers migrate South each spring. However, you have not mentioned how this estimate was developed or how you would determine future nesting success.

2. Page 17 - As you inventory the suitable jack pine habitat, you might look at cowbird populations using particular portions of it. It might be that not all of the areas are inhabited by cowbirds during the warbler nesting season, and if that is the case, these areas should be given first consideration.

3. Is there anything unique about the warbler's feeding habits that might have contributed to its decline?

4. Could habitat management techniques be employed to make existing warbler nesting areas less attractive to cowbirds without reducing their utility for warblers?

Sincerely yours,

Robert H Stroh

ACTING Regional Director

CONSERVE AMERICA'S ENERGY

*Save Energy and You Serve America!*

Robert H. Shields
Acting Regional Director
Fish and Wildlife Service
Boston, Massachusetts 02109

p. 17 Cowbirds are well distributed throughout the critical jack pine habitat.

p. 27 To check the entire population for productivity would involve disturbing a lot of nests. Productivity checks will be on a limited basis to detect any gross changes in production.

Quest.#3 As far as the Committee knows, there is nothing unique about the warbler's feeding habits. We hope that future research efforts will determine the cause of the decline.

Quest.#4 Habitat manipulation for warbler management appears to attract cowbirds. Insofar as we can determine, the distribution of cowbirds is so uniform over the entire range that it is almost impossible to improve any habitat for the warbler witout attracting the cowbird.

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

March 11, 1976

TO: John Byelich
Kirtland's Warbler Recovery Team Leader
Wildlife Division

FROM: C. D. Harris
Chief, Bureau of Resources Management

SUBJECT: Kirtland's Warbler Recovery Plan

You and the Recovery Team are to be complimented for the excellent plan prepared for recovery of the Kirtland's Warbler.

Maybe the plan is not the place but I am concerned that it does not identify or suggest sources of funding for all three agencies involved - that is the Forest Service, U.S. Fish and Wildlife Service, and the Department of Natural Resources. None of these agencies is now adequately funded to carry out the program in the time frame established.

Does the Department of Natural Resources finance its share from game and fish funds? Somewhere this should be clearly stated and emphasized that it is not a game program and therefore should be financed from sources other than hunting licenses. Neither the Rare and Endangered Species Act, P.L. 93-205, nor the Sikes Act, P.L. 93-452, have been funded by Congress to finance those responsibilities of the Fish and Wildlife Service and the Forest Service on the program and neither has the Endangered Species Act been funded to date to provide, as intended, grants to state agencies.

It would seem in promoting the recovery plan the financing difficulties should be identified. Anyone not familiar with our funding problems will probably assume that funds are available to finance the costs identified in the plan. Therefore it is a bit misleading.

CDH:rp

C D Harris

Charles D. Harris
Chief, Bureau of Renewable Resource
Management
Michigan Department of Natural Resources
Lansing, Michigan 48926

The purpose of the plan is to provide the basis for various agencies to request funds other than Fish and Game Funds. The Team anticipates that other financial support will be forthcoming upon approval of the Recovery Plan.