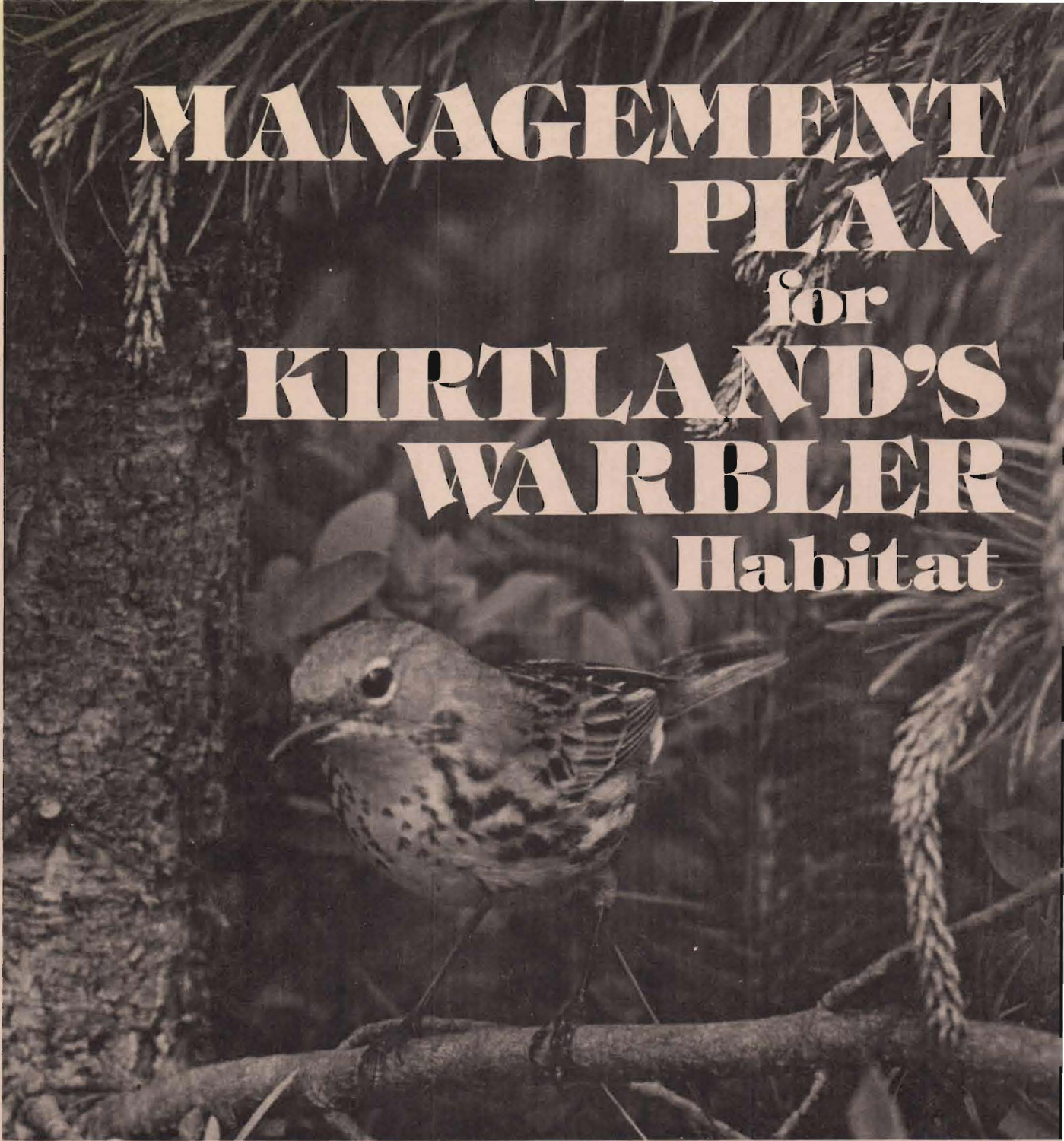


MANAGEMENT PLAN for KIRTLAND'S WARBLER Habitat



FOREST SERVICE



U.S. DEPARTMENT OF AGRICULTURE

MICHIGAN DEPARTMENT

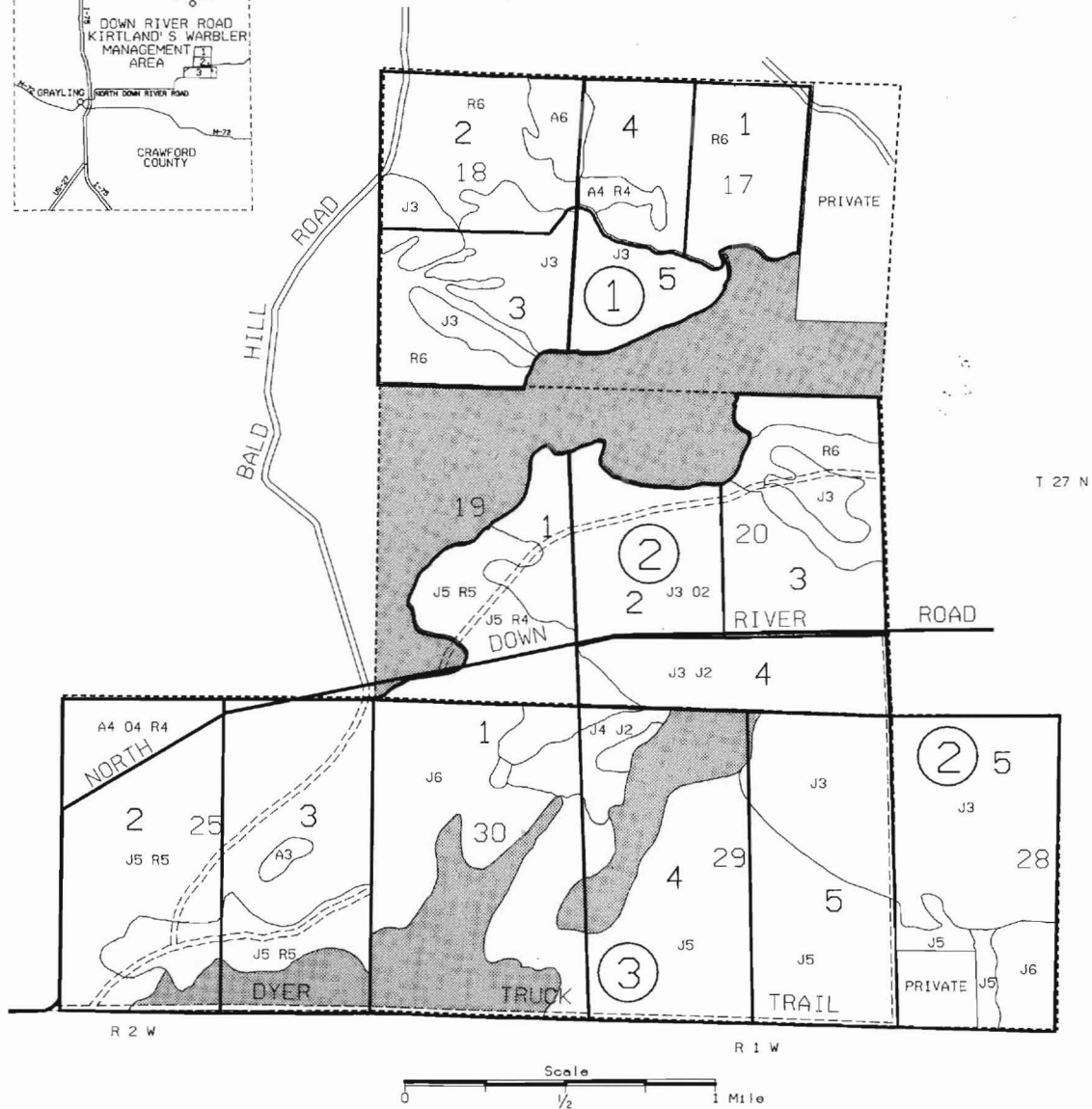
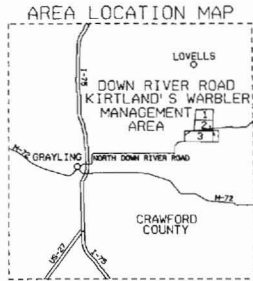


OF NATURAL RESOURCES

DOWN RIVER ROAD KIRTLAND'S WARBLER MANAGEMENT AREA

CRAWFORD COUNTY, MICHIGAN
(COMPARTMENTS NO. 1, 2 & 3)

T 27 N , R 1 & R 2 W



TYPE CLASSIFICATION

- A-Aspen, White Birch
- G-Upland Grass
- J-Jack Pine
- O-Oak-red, white or black
- R-Red Pine

STAND SIZE and STOCKING

- Reproduction
 - 1-low
 - 2-medium
 - 3-high
- Pole Timber
 - 4-low
 - 5-medium
 - 6-high
- Saw Timber
 - 7-low
 - 8-medium
 - 9-high

- NOT WARBLER HABITAT
- COMPARTMENT BOUNDARY
- CUTTING BLOCKS

FOREWORD

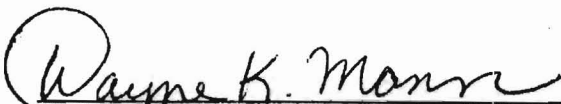
Our changing environment has brought a number of species to the brink of extinction. Congress, in passing the Endangered Species Act of 1973, established as a national goal the conservation of endangered wildlife. Our concern for the environment is our concern for the least of its inhabitants. As Aldo Leopold stated, "The land and the wild things living on it is a community to which man belongs."

The endangered Kirtland's Warbler provides an example of a species whose numbers have been dramatically reduced through the indirect influence of man. The amount of suitable nesting habitat for the Warbler has declined sharply in recent years, due to man's successful endeavors in the area of wildfire control. Although probably never an abundant species, the Kirtland's recent population decline has caused alarm within environmental groups and throughout a diverse concerned public. The Kirtland's population has reached critically low numbers, with extinction casting an ever-present shadow on the future existence of this colorful songbird.

Direction for development of the Habitat Management Plan was provided by the Kirtland's Warbler Recovery Team. The Recovery Plan identifies five major objectives that are essential to the recovery of the Warbler. These objectives are; (1) Maintain and develop suitable nesting habitat for the Kirtland's Warbler throughout its former known range; (2) Protect the Kirtland's Warbler on its winter grounds and along the migration route; (3) Reduce key factors adversely affecting reproduction and survival of the Kirtland's Warbler; (4) Monitor breeding populations of the Kirtland's Warbler to evaluate response to management practices and environmental changes, and (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. The proposed Habitat Management Plan is a cooperative effort by the Forest Service - U. S. Department of Agriculture and the Michigan Department of Natural Resources. The Habitat Management Plan describes Forest Service and State responsibilities to meet the first objective stated above.

This Plan, when implemented, will provide a sustained, even flow of suitable nesting habitat for the future. The Plan coordinates timber resource values with known nesting habitat requirements of the Kirtland's Warbler.

In compliance with the provisions of Section 7 of the Endangered Species Act (P.L. 93-205) and in partial fulfillment of the objectives outlined in the Kirtland's Warbler Recovery Plan, we endorse the following Habitat Management Plan.



WAYNE K. MANN Date March 20, 1981
Forest Supervisor
Huron-Manistee National Forest



DR. HOWARD A. TANNER Date 03/10/81
Director
Michigan Department of Natural
Resources

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INTRODUCTION

The Kirtland's Warbler, Dendroica kirtlandii, was first discovered in 1851 when a spring migrant was taken near Cleveland, Ohio. Five more spring migrants (four in Ohio and one in southern Michigan) were collected before the first wintering bird was collected on January 9, 1879, on Andros Island, Bahamas. Between 1884 and 1897 there were 71 specimens collected throughout the Bahamas. This species has never been found outside the Bahamas in winter, except for an unconfirmed report of two being observed near Veracruz, Mexico in November, 1974. Subsequent searches in the area have failed to verify that the Kirtland's Warbler does winter in Mexico.

It was over a half century after the species was first described that its nesting range was discovered. A specimen collected on June 13, 1903, near the AuSable River in western Oscoda County, Michigan was taken to Norman A. Wood, curator of birds at the University of Michigan Museum of Zoology, who identified it as a Kirtland's Warbler. Wood promptly set out on a trip to Oscoda County, traveling by rail, rowboat, buggy, and foot to search for nesting birds. Between July 2 and 7 he discovered two small groups of Warblers which he described as "colonies" near Butler Bridge (now Parmalee Bridge) in "jack pine plains," but found no nests. On July 8, 1903, Wood moved to a jack pine plain farther to the west and in the western part of Section 31, T27N, R1E, Oscoda County, he found the first nest.

Singing males and migrants have been found in other parts of the Great Lakes Region, from Minnesota to Quebec, but nowhere other than Michigan has a nest been found. Searches for nesting birds have been intensified in Canada and Wisconsin the past year or two. These searches were continued and were expanded to Minnesota in 1979.

Nesting Habitat

It became quickly apparent to the early observers of the Kirtland's Warbler that these birds were always associated with the areas of the northern Lower Peninsula of Michigan commonly referred to as the "jack pine plains" or "barrens". Residents of the region called this Warbler the "Jack-pine Bird". Subsequent studies of the species have shown it to have an extremely close association with a particular "life community" of the jack pine type.

Jack pine is found on the North American continent from the Maritime Provinces of eastern Canada west to the upper Yukon Valley in the Northwest Territories, and from the middle of Michigan's Lower Peninsula and mid-Wisconsin to the continent's tree line. It is in the southern

extremity of the jack pine range and on the driest, most rudimentary sand soils of Lower Michigan that the Kirtland's Warbler has found its niche. Almost all nesting has been found to occur on the Grayling sand soils. A few have been found nesting adjacent to the Grayling sands on Grayalm, Deer Park, Rubicon and Croswell sands. There are also records of nesting on two isolated areas where jack and/or red pine had been planted on severely eroded Kalkaska sands.

Although it is not completely understood why, the recent burning of a jack pine site prior to its regeneration appears to be a highly significant, if not a necessary factor in the use of a stand for nesting.

Burning may have some subtle effects on the soil and plant community that have yet to be detected. Observations to date show that recent fire has been a factor on nearly all sites where Warblers have been known to nest successfully.

The jack pine stand itself is used for nesting only in a certain stage of development. Warblers will start using a stand when the height of the tree reaches 5 to 7 feet (or at an age of 6 to 13 years with the average being 8). Stands less than 80 acres in size are seldom occupied, and nesting success has been found to improve greatly where "colonies" of Warblers occupy stands 200 acres and larger.

The density of the stand is usually variable, with dense patches and numerous small openings interspersed throughout. Evenly spaced plantations are used but the presence of openings appears to be essential. Common associated tree species in these jack pine stands are oaks, aspen, cherries, june berry, and other pines. It appears that the Kirtland's Warbler will not use a stand where the density of the deciduous species approaches equity with the pine.

The ground vegetation consists of plants that can survive fire, drought, and thermal extremes. These are mostly low shrubs and deep-rooted perennial herbs. The density varies from sparse areas with bare ground exposed to quite dense patches. In fact, there is usually a mosaic of patches of sedges, patches of shrubs, and patches of grasses and forbs. These Warblers prefer heavier cover for nest sites, with mixed blueberry and grass areas being favored locations. However, nests are occasionally found where cover is poor.

The Kirtland's Warbler will continue to nest in jack pine stands as long as the trees retain relatively dense living branches near the ground. Depending on the density of the trees, the lower branches are lost when jack pine reaches a height from 16 to 20 feet (usually age 21 in Michigan). When this occurs the structure of the habitat is apparently no longer acceptable to the Warbler for nesting.

Kirtland's Warblers have occasionally been found to nest in red pine plantations. Apparently, planted red pine sometimes creates a life form that is acceptable for this bird. However, in most cases the Warblers have moved into the red pine from an adjacent jack pine habitat. In other circumstances where this species has used unusual habitats such as jack pine not regenerated by fire, or on soils other than Grayling sand, they apparently have moved from adjacent "typical" habitats. Trying to create a typical habitat in isolated areas would probably be futile.

The Dry Site Jack Pine Community

The identification of some 135,000 acres of the Grayling sand jack pine type for management of Kirtland's Warbler habitat is, in essence, the identification of these stands for the management of a life community in which there is a rather unique assemblage of species. It is the only known life community where the Kirtland's Warbler is adapted to survive.

Like all forest types, there are sequential changes throughout the various stages of these jack pine stands. Immediately after the old stand has been removed through cutting and/or burning, those species adapted to open conditions will occupy the site. Representative bird species include the Common Nighthawk, Vesper and Field Sparrows, Prairie Warbler, Sharp-tailed Grouse (if in adjacent areas), and Upland Sandpiper. Where there are snags to produce cavities, the Eastern Bluebird, Tree Swallow, Yellow-shafted Flicker, and other open area cavity-nesters are common. As the new stand of jack pine takes form, and the lower pine branches begin to touch, the "open" species decline and the "intermediate" species move in. These include the Clay-colored Sparrow, Hermit Thrush, and the Nashville and Kirtland's Warbler (along with other species). As the stand continues to develop, the community changes. At about the stage where the lower branches thin out and the Warbler leaves, the stand then becomes usable by other species such as the Spruce Grouse and Whip-poor-will. When the stand moves into the "old-age" form, inhabitants include the woodpeckers, cuckoos, and other arboreal species. Of course, the more adaptive species such as the Robin, Blue Jay, Black-capped Chickadee, and Brown Thrasher will be found in all stages of this community.

The management of the dry site jack pine community under the strategy outlined in this plan will simultaneously provide sustained habitat conditions for a wide variety of plant and animal species, including the Kirtland's Warbler, and a valuable wood fiber resource for man.

History of Organized Efforts at Management

In 1957, the first major effort was made at providing breeding habitat for the Kirtland's Warbler. Three areas, in Ogemaw, Crawford, and Oscoda counties, each comprising roughly four square miles, were established specifically as Warbler management units (Radtke and Byelich, 1963; Mayfield, 1963). All three were on state forest land. Portions of two of these areas were planted with jack pine using a special configuration to provide openings within the stand. The intention was to maintain these tracts in three age classes, seven years apart, by burning and replanting the stands when they reached an age of 21 years. Planting of the third area in Oscoda County was held in abeyance because pines on that area were approaching a commercially harvestable age. Harvesting has not yet occurred on this area, however, since almost one-third of this tract was burned by a wildfire in 1964. The regeneration which resulted because of that fire has provided nesting habitat for the past several years.

In 1960, the Forest Service began working on a management plan for the Kirtland's Warbler. This plan was approved in 1962 and a 4,010-acre tract was dedicated in June 1963. The plan established 12 management blocks of about 320 acres each in the Mack Lake Area, Oscoda County. Ultimately, each block was to be grown on a 60-year commercial rotation with five years age difference between blocks (Mayfield, 1963).

In addition, in 1973 and 1974, the Huron National Forest cut, burned, and planted areas near Luzerne, Oscoda County, and Tawas, Iosco County, for the benefit of the Warbler.

The third decennial census in 1971 showed an alarming decline of 60 percent in the population level of nesting Warblers. This decline initiated a meeting sponsored jointly by the USDA--Forest Service and Michigan Department of Natural Resources. One of the major results of this meeting was the formation of an ad hoc steering committee whose responsibility was to outline needed habitat research, propose restrictions on human activity in nesting areas, initiate a cowbird control program, and locate funding.

Through the efforts of members of this committee, the Department of Natural Resources and the USDA--Forest Service established an official policy with specific points designed to improve the outlook for the Warbler. A policy to treat the best warbler jack pine stands for a period of not less than five years for the purpose of improving warbler habitat was adopted. Provisions of this policy included the use of clearcutting followed by prescribed burning. These practices would complete the habitat improvement work. An intensive program was envisioned.*

*Letter from M. L. Petoskey, Chief, Wildlife Division, to C. D. Harris, Deputy Director, DNR, Feb. 28, 1972.

Efforts to aid the Kirtland's Warbler were given a giant thrust forward when the Endangered Species Act of 1973 became law (P.L. 93-205). This act provided the means to have the Kirtland's Warbler officially declared "endangered", provided for acquisition of land to increase available habitat, provided funding to carry out additional management programs, set up provisions for state cooperation with the Federal government, and established various legal protections for endangered species. It was the most encompassing endangered species legislation to date. Previous Acts in 1966 and 1969 (P.L. 89-669 and P.L. 91-135, respectively) did, however, among other things, provide for endangered species listings, research, and some habitat acquisition.

The Federal Endangered Species Act was supplemented by the Michigan Endangered Species Act of 1974 (P.A. 203, 1974). This act provides added legal protection to listed species.

Rules promulgated under the Endangered Species Act of 1973 called for the establishment of Recovery Teams to assist the Fish and Wildlife Service in carrying out provisions in the Act. In early 1975, a Kirtland's Warbler Recovery Team was named by the Secretary of the Interior to guide efforts in aiding the Warbler. As a result of efforts by the Team, a Kirtland's Warbler Recovery Plan (Byelich, et al, 1976) was prepared outlining steps designed to increase the species' population. The primary objective of the Plan is to "Reestablish a self-sustaining wild Kirtland's Warbler population throughout its known former range at a minimum level of 1,000 pairs". Secondary objectives, designed to accomplish the primary objective, are as follows:

1. Maintain and develop 135,000 acres of suitable nesting habitat for the Kirtland's Warbler throughout its former known range.
2. Protect the Kirtland's Warbler on its wintering grounds and along the migration route.
3. Reduce key factors adversely affecting reproduction and survival of Kirtland's Warbler.
4. Monitor breeding populations of the Kirtland's Warbler to evaluate responses to management practices and environmental changes.
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.

The Kirtland's Warbler Habitat Management Plan is a guide designed to direct management toward the achievement of the first of these secondary objectives listed above.

Since potential Warbler habitat occurs in significant acreages on both State (Michigan Department of Natural Resources) and Federal (USDA -- Forest Service) land and since both these agencies have individual land management functions, each agency has been made responsible for developing habitat on the land with which it is entrusted. The Management Schedule portion of this Habitat Management Plan will describe, in detail, each agency's on-the-ground land management program for the development and improvement of Kirtland's Warbler nesting habitat for the next 50 year period.

LITERATURE CITED

- Byelich, J., et al. Kirtland's Warbler Recovery Plan Kirtland's Warbler Recovery Team. Lansing, Michigan.
- Mavfield, H.F. 1963. Establishment of Preserves for the Kirtland's Warbler in the State and National Forests of Michigan. Wilson Bulletin 75: 216-220
- Radtke, R. and J. Byelich. 1963. Kirtland's Warbler Management. Wilson Bulletin 75: 208-215.

MANAGEMENT DIRECTIONS

The purpose of this section is to define the methods for protecting and improving designated critical nesting habitat for the survival of the Kirtland's Warbler and for compliance with the provisions of Section 7 of the Endangered Species Act, as amended. After acceptance of this plan any proposed deviations from these specified practices shall be subject to the consultation process as required by that Act.

A. Habitat Management Framework

All potential breeding habitat on the State and National Forests (and on adjacent private lands) was identified. After field examination and stand data analysis, those stands that were believed to be suitable and manageable for nesting habitat were identified for proposal as critical habitat. Contiguous stands or stands in close proximity were grouped into Management Areas. Twenty-three Areas have been established, 16 on State Forests and seven on the Huron National Forest. Each Area is divided into Management Units containing between 1,000 and 2,000 acres of suitable habitat. Most Units have been subdivided into five Cutting Blocks, with each Block containing some 200 or more acres of contiguous stands of habitat. Blocks were laid out so that the stands within a Block are as near the same age as possible. However, many Cutting Blocks contain stands of dissimilar ages. Cutting and regeneration of these Blocks may result in less than optimum timber yield during the first rotation, due to sacrificing some immature stands and carrying some mature stands beyond their economic rotation age. In many cases, however, individual Block prescriptions have been adjusted to provide for the harvesting of mature timber in an otherwise non-current Block to minimize this loss. In some cases, an adjustment could result in a reduction of the full potential of the habitat during the first rotation period.

Blocks in each of the Management Units are to be cut sequentially at 10-year intervals, starting with the first Block and progressing to the fifth Block during the last decade of the rotation. Rotation length is to be 50 years. Exceptions to this will be made where there is a preponderance of stands of older age classes within a Unit. In such Units, both the first and fifth Blocks should be regenerated during the first decade so that the stands in the fifth Block are not deferred too long and will be once again merchantable during the last decade of the rotation period. Where all Blocks are of the same age in a Unit (e.g. as some of the Pine River and McKinley Units), the regeneration of Blocks could be at 5-year intervals for the first rotation. During the next rotation, Block ages can be adjusted by cutting the first Block at age 40 and then cutting the subsequent Blocks at 10-year intervals. This would mean

that a high amount of nesting habitat would be available in these Units during the first rotation, followed by a probable period of some 10 years where there would be no suitable habitat. Since the number of such Units will not be too great and such adjustments will vary somewhat, the overall effect should not be very significant to the total population.

The Mack Lake Unit, which is a dedicated area on the Huron National Forest has been subdivided into 10 Blocks which are to be regenerated at five year intervals. This is consistent with the original management plan and allows for more intensive management on this area.

B. Silviculture

Even-aged silvicultural methods that will produce the habitat structure necessary for Kirtland's Warbler nesting are to be used. The well-documented history of Warbler nesting based on thousands of observations very strongly indicates that fire is a necessary factor in creating suitable nesting habitat for this species. Research is in progress which should better define the specific impact of burning on nesting habitat and nesting success. Unless it can be demonstrated that productive nesting habitat can consistently be developed without the use of fire, prescribed burning will be the primary tool used in the regeneration process. Any proposals that deviate from this must receive Wildlife review and interdisciplinary approval.

1. Final Harvest and Prescribed Burning

- a. Clearcut - Clearcut, prescribe burn for site preparation, and plant jack pine seedlings. (Since natural regeneration of jack pine may fail or require a longer time to become established, planting will be the preferred method for regenerating most stands in the first Block in each Unit. Exceptions will be to designate some stands for natural regeneration attempts using method b. or proposals under c.).
- b. Seed tree cut - A seed tree cut (leaving 20 or more jack pine seed trees per acre, or comparable numbers in patches or strips), followed by prescribed burning to prepare the site for natural regeneration and seed release, is recommended.
- c. Logging methods - Some mechanized logging methods remove slash or concentrate slash in a logging area. This may adversely affect the results of a burn and not produce suitable habitat.

Sale contract provisions shall exclude logging methods which remove tree tops and other slash, or which allow windrowing or concentrating slash. Contract specifications should require slash to be left scattered over the cutting area. Any deviations from such provisions will require interdisciplinary review and approval.

- d. Other - Proposals to regenerate a stand using any method other than described above shall receive interdisciplinary review and approval. This will include experimental treatments, high hazard conditions, critical timing for planting and other reasonable proposals.

2. Regeneration

- a. Planting - In addition to regenerating the stand, the objective is to produce a suitable configuration for nesting habitat. General guides are:
 - (1) Spacing - Spacing of jack pine trees will be 6' x 6' or less.
 - (2) Density and Configuration - Approximately 25% of the block will be left unplanted in small (about 1/4 to 1/2 acre), well-dispersed openings, or in a strip configuration.
 - (3) Survival Checks - Survival checks shall be made:
 - (a) In planted areas after the first and third year.
 - (b) In natural regeneration areas after the third and fifth years. (If it appears that the area may still have a good chance to be regenerated, additional checks may be made up to the 10th year after the burn or other treatment.) The decision for the necessity to re-plant shall be made if survival of planting is found to be inadequate (less than 75% in planted areas) after either the first year or third year checks of planted areas. If it appears that natural regeneration has failed after the fifth year, with little likelihood of a well stocked stand developing, planting may be necessary.

- b. Broadcast seeding - Broadcast seeding is another possible alternative for regeneration of Warbler Habitat. To date, success with this regeneration method has been localized and infrequent. Perhaps future developments or research findings may make this alternative more feasible. Until reliable techniques are developed, any broadcast seeding in Warbler habitat will require interdisciplinary approval.

3. Cultural and Intermediate Treatments

Practices such as the development of openings, overstory removal, thinning, interplanting, etc., shall not lessen the quality of the habitat.

- a. Proposals for such work shall be reviewed by the appropriate Wildlife Biologist to assure compatibility with Warbler habitat requirements. Should there be possible adverse effects and the Forest wishes to continue with the proposal, consultation as required by the Endangered Species Act will follow. In the case of the Forest Service, informal consultation shall be initiated by the Forest Supervisor.
- b. Proposed activities should be performed prior to when the stand is occupied or after abandonment by Kirtland's Warblers, but not during the years of occupancy.
- c. Snags provide favored perch sites for the Kirtland's Warbler and are also utilized by cavity nesting species (Bluebird, Kestrel, Black-backed Three-toed Woodpecker, etc.). Conversely, snags are probably also used substantially as perching sites for Brown-headed Cowbirds during the process of nest parasitism. Intensive cowbird trapping has precluded this undesirable use of snags at the present time. Harvest of live or dead trees should not be permitted in Warbler habitat during years of occupancy. Snags and live overstory may be removed from incipient habitat only where beneficial to the Warbler, as determined by the Forest Biologist.

C. Species and Habitat Protection

Some uses of public forest lands can and do have adverse impact on this species and its habitat. However, many of these uses can be permitted if properly regulated and coordinated. There are some activities that are also essential for insuring the protection of the species and maximum use of its habitat.

1. Fire Prevention and Control: Although fire is considered essential for the development of this bird's habitat, it can also be a threat to occupied or developing habitat. Therefore, prevention, pre-suppression, and suppression plans should, to the extent possible:
 - a. Consider critical habitat, where ages of jack pine are from one to 21 years, (or whenever occupancy has concluded) as very high priority in prevention of fire losses.
 - b. Employ compatible methods in hazard and risk reduction. Anything that alters vegetation or habitat should be done prior to or following occupancy by Kirtland's Warblers.

When critical habitat has reached the stage where it no longer supports Warblers, the priority can be changed to whatever is appropriate for the area.

2. Insect and Disease Control--Some insects and diseases can be a threat to Warbler habitat, and some of these could present a real dilemma. The use of certain control methods could be very destructive to the birds. Should a significant problem develop in critical habitat, the responsible land manager shall request that the situation be appraised and appropriate action taken. This will require consultation if a chemical insecticide is proposed.
3. Predator and Parasite Control--At the present time the Fish and Wildlife Service is controlling cowbirds within nesting areas. These activities are within the scope of the Recovery Plan and are coordinated through the Recovery Team. Any other such activities will be coordinated in this manner. These activities may be reduced if the Warbler population increases significantly.

4. Recreation--Recreationists can adversely affect (intentionally or inadvertently) this bird and its habitat. There is a need to regulate recreational use to reduce such impacts.
- a. Occupied habitats shall be closed to public entry during the breeding and nesting season, except through conducted tours. (There may be some relaxation on closures as populations increase and conditions warrant.) Closed areas are to be adequately posted and closed roads within such areas are to be gated where necessary.
 - b. Recreational developments, including trails and roads, generally are not to be constructed in or adjacent to critical habitat. Where trails are proposed, an interdisciplinary review and approval shall be required. Approval may be contingent upon closing and/or re-routing the trail when a Block is regenerated or occupied by Warblers.
 - c. It is recognized that forest cover manipulation necessary for Kirtland's Warbler habitat management is highly visible to the public. It is also recognized that a significant number of the public that use or reside near the management areas place high value on the visual resource. Their acceptance of the management practices is necessary to the continuance of the program.

An active visual management program including information-education and modification of normal management practices near high public use zones, such as major roads and residential areas, is necessary to maintain this public acceptance. Both the U.S. Forest Service and Michigan Department of Natural Resources have ongoing visual management programs.

Modification of Kirtland's Warbler habitat management practices for the protection of visual values will in some cases reduce or eliminate use of minor acreages by the birds. The significance of this small loss of habitat is not great when compared to the values gained.

5. Road Construction and Other Structural Developments--When planning new roads and structures, critical habitat should be avoided. If this can not be done feasibly, (on Federal lands or where Federal project dollars are involved), then a request for consultation with the Fish and Wildlife Service will be required. (This does not include roads that are part of a timber sale in critical habitat).
6. Minerals--Gas and oil deposits under some critical habitat areas may be developed with the application of certain restrictions.
 - a. Drilling activity shall only be done from approved locations, including access roads.
 - b. Drilling activities in, or adjacent to, occupied habitat shall not be done between May 1 and September 30.
 - c. In occupied habitat a proven well can be operated between October 1 and May 1, but shall not be operated between May 1 and September 30 unless it is pumped by a bottom-hole pump and the oil is transported by buried pipeline. Any well emitting toxic or sour gases into the air shall not be operated from May 1 to September 30.
 - d. Approved drilling activities may occur in unoccupied critical habitat the year round.
 - e. Oil and gas development in all habitat shall be done in such a manner that the management of habitat through the use of prescribed burning is not precluded. This includes:
 - (1) Taking steps to protect well pads.
 - (2) Burying of pipelines to safe depths.
 - (3) Locating storage facilities outside of critical habitats.
7. All proposals for any other activities within critical habitat not covered above are subject to the consultation process.

D. Unforeseen Circumstances

A substantial amount of potential Warbler habitat has been excluded from the existing designated critical habitat. Most of the deleted potential habitat is presently in areas with established red pine plantations. Wildfires, insects, disease, and other factors, may offer an opportunity for conversion of some of these sites back to the jack pine type. When these opportunities appear, each site should be critically evaluated and considered for designation as critical habitat.

E. The Mack Lake Fire




A prescribed burn to improve habitat for the Kirtland's Warbler, fanned by high winds and changes in burning conditions, turned a 200 acre controlled burn into a major wildfire covering 25,000 acres before being contained. The fire, located in the Mack Lake Management Area burned 100 acres of suitable habitat and 200 acres of habitat nearing optimum age. The fire, which occurred on May 5-6, 1980, had little direct effect on the Kirtland's Warbler, as the birds had not yet arrived from their wintering grounds.

The Mack Lake Area is important since it supports a majority of the Warbler nesting population found on National Forest land. Nesting use have been declining however because of advancing age of the jack pine.

The Mack Lake Area includes 10,420 acres of National Forest land proposed for classification as Critical Habitat (see Summary). An additional 785 acres of private land could provide suitable habitat. Of this acreage, 6,900 acres of National Forest land and 545 acres of private land were within the Mack Lake fire. The fire will significantly alter the cutting schedule for the Mack Lake Management Area as detailed in this Plan.

There has been good to excellent regeneration of natural jack pine following the burn. If this continues the Mack Lake Area will provide good warbler habitat in the late 1980s, and the anticipated outlook for limited nesting habitat in the late 1980s might not occur (see Present and Projected Acreage of Occupiable Nesting Habitat).



-  U.S. Forest Service Critical Habitat
-  State Forest Critical Habitat
-  Military Area Habitat

KIRTLAND'S WARBLER HABITAT IN MICHIGAN

<u>AREA</u>	<u>ACRES</u>	<u>DISTRICT</u>
<u>McKinley KWMA</u>		
Blockhouse Unit -	1,334	Harrisville
Byron Lake Unit -	1,373	Harrisville
Comins Flat Unit -	1,995	Mio-Harrisville
Game & Forest Unit -	947	Harrisville
Hardy Grade -	1,416	Harrisville
Old Roadhouse Unit -	1,243	Harrisville
Reed Road Unit -	<u>1,322</u>	Harrisville
TOTAL -	9,630	
<u>Pere Cheney KWMA</u>		
Chase Bridge Unit -	<u>1,527</u>	Mio
TOTAL -	1,527	
<u>Pine River KWMA</u>		
Unit I -	1,217	Harrisville
Unit II -	1,294	Harrisville
Unit III -	905	Harrisville
Unit IV -	951	Harrisville
Unit V -	1,482	Harrisville
Unit VI -	1,035	Harrisville
Unit VII -	1,367	Tawas
Unit VIII -	1,576	Tawas
Unit IX -	1,788	Tawas
Unit -	<u>1,283</u>	Tawas
TOTAL -	12,898	

<u>AREA</u>	<u>ACRES</u>	<u>DISTRICT</u>
<u>Tawas KWMA</u>		
Buck Creek Unit -	1,175	Tawas
Monument Road Unit -	1,043	Tawas
Oscoda Unit -	1,294	Tawas
Silver Creek Unit -	1,207	Tawas
Vaughn Creek Unit -	<u>1,113</u>	Tawas
TOTAL -	5,832	

TOTALS:

Mio Ranger District	26,147
Harrisville Ranger District	15,495
<u>Tawas Ranger District</u>	<u>11,846</u>
Huron National Forest -----	53,488

SUMMARY OF ACREAGE IDENTIFIED AS CRITICAL KIRTLAND'S WARBLER
HABITAT BY AREAS AND MANAGEMENT UNITS ON STATE OF MICHIGAN LANDS

<u>AREA</u>	<u>ACRES</u>	<u>STATE FOREST</u>
<u>Big Creek</u>		
Management Unit 1	1,334	AuSable St. Forest
Management Unit 2	<u>1,040</u>	AuSable St. Forest
TOTAL	2,374	
<u>Clear Lake - Tomahawk Creek</u>		
Management Unit 1	1,894	Mackinac St. Forest
Management Unit 2	1,096	Mackinac St. Forest
Management Unit 3	1,031	Mackinac St. Forest
Management Unit 4	742	Mackinac St. Forest
Management Unit 5	1,409	Mackinac St. Forest
Management Unit 6	<u>299</u>	Mackinac St. Forest
TOTAL	6,471	
<u>Crapo Lake Area</u>		
Management Unit 1	1,215	Mackinac St. Forest
Management Unit 2	1,041	Mackinac St. Forest
Management Unit 3	<u>949</u>	Mackinac St. Forest
TOTAL	3,205	

<u>AREA</u>	<u>ACRES</u>	<u>STATE FOREST</u>
<u>Damon</u>		
Management Unit 1	1,393	AuSable St. Forest
Management Unit 2	1,263	AuSable St. Forest
Management Unit 3	1,460	AuSable St. Forest
Management Unit 4	1,039	AuSable St. Forest
Management Unit 5	1,513	AuSable St. Forest
Management Unit 6	1,649	AuSable St. Forest
Management Unit 7	1,141	AuSable St. Forest
Management Unit 8	1,600	AuSable St. Forest
Management Unit 9	1,327	AuSable St. Forest
Management Unit 10	1,361	AuSable St. Forest
Management Unit 11	1,356	AuSable St. Forest
Management Unit 12	1,256	AuSable St. Forest
Management Unit 13	<u>1,219</u>	AuSable St. Forest
TOTAL	17,577	

<u>Fletcher Road</u>		
Management Unit 1	1,556	Pere Marquette St. Forest
Management Unit 2	1,206	Pere Marquette St. Forest
Management Unit 3	<u>1,616</u>	AuSable St. Forest
TOTAL	4,378	

<u>AREA</u>	<u>ACRES</u>	<u>STATE FOREST</u>
<u>Leota</u>		
Management Unit 1	1,345	AuSable St. Forest
Management Unit 2	967	AuSable St. Forest
Management Unit 3	1,170	AuSable St. Forest
Management Unit 4	<u>877</u>	AuSable St. Forest
TOTAL	4,359	
<u>Love11s</u>		
Management Unit 1	1,442	AuSable St. Forest
Management Unit 2	1,229	AuSable St. Forest
Management Unit 3	1,433	AuSable St. Forest
Management Unit 4	1,266	AuSable St. Forest
Management Unit 5	<u>1,516</u>	AuSable St. Forest
TOTAL	6,886	
<u>Manistee River</u>		
Management Unit 1	1,003	Pere Marquette St. Forest
Management Unit 2	1,258	AuSable St. Forest
Management Unit 3	<u>967</u>	AuSable St. Forest
TOTAL	3,228	
<u>Muskrat Lake</u>		
Management Unit 1	1,370	AuSable St. Forest
Management Unit 2	1,656	AuSable St. Forest
Management Unit 3	<u>1,594</u>	AuSable St. Forest
TOTAL	4,620	

<u>AREA</u>	<u>ACRES</u>	<u>STATE FOREST</u>
<u>North Branch</u>		
Management Unit 1	1,441	AuSable St. Forest
Management Unit 2	<u>955</u>	AuSable St. Forest
TOTAL	2,396	
<u>Ogemaw Refuge</u>		
Management Unit 1	1,633	AuSable St. Forest
Management Unit 2	1,379	AuSable St. Forest
Management Unit 3	1,405	AuSable St. Forest
Management Unit 4	946	AuSable St. Forest
Management Unit 5	<u>529</u>	AuSable St. Forest
TOTAL	5,892	
<u>Pere Cheney</u>		
Management Unit 1	1,230	AuSable St. Forest
Management Unit 2	<u>1,168</u>	AuSable St. Forest
TOTAL	2,398	
<u>Sharon</u>		
Management Unit 1	1,167	Pere Marquette St. Forest
Management Unit 2	1,020	Pere Marquette St. Forest
Management Unit 3	942	Pere Marquette St. Forest
Management Unit 4	<u>965</u>	Pere Marquette St. Forest
TOTAL	4,094	

<u>AREA</u>	<u>ACRES</u>	<u>STATE FOREST</u>
<u>St. Helen</u>		
Management Unit 1	1,150	AuSable St. Forest
Management Unit 2	1,324	AuSable St. Forest
Management Unit 3	<u>579</u>	AuSable St. Forest
TOTAL	3,053	

<u>Staley Lake</u>		
Management Unit 1	1,236	AuSable St. Forest
Management Unit 2	<u>1,422</u>	AuSable St. Forest
TOTAL	2,658	

<u>Warbler Monument</u>		
Management Unit 1	<u>554</u>	AuSable St. Forest
TOTAL	554	

TOTALS:

AuSable State Forest	- 56,608 Acres
Mackinac State Forest	- 9,676 Acres
Pere Marquette State Forest	- <u>7,859 Acres</u>
State of Michigan	74,143 Acres

Summary - Critical Habitat for Kirtland's Warbler

Huron-Manistee National Forest	- 53,488 Acres
State of Michigan	- 74,143 Acres
Total - Michigan	127,631 Acres

PRESENT AND PROJECTED ACREAGE OF OCCUPIABLE

NESTING HABITAT (1979 - 1989)

An analysis was recently completed on State of Michigan and National Forest lands proposed for designation as critical or essential habitat for the Kirtland's Warbler. Stand data were examined to determine how much occupiable Kirtland's Warbler habitat exists at the present time (1979), how much will exist five years from now (1984), and ten years from now (1989). In making this analysis the following criteria were utilized:

- (1) Stands 40 acres or larger were considered (actually the Kirtland's Warbler rarely occupies a stand less than 80 acres in size).
- (2) "Occupiable-aged" is assumed to be from 10 to 20 years old for planting and for regeneration following commercial harvest, and 8 to 20 for wildfire areas.
- (3) Only those stands that have been regenerated to date (1979) were included in the analysis.

The following table summarizes the findings of this analysis:

<u>Management Agency</u>	<u>Acreege Apparently Occupiable in 1979</u>	<u>Acreege Occupiable-Aged in 1984</u>	<u>Acreege Occupiable Aged in 1989</u>
U.S. Forest Service	3,937	5,388	5,926
State of Michigan-Proposed Critical Habitat	11,017	10,474	4,618
State of Michigan- Military Area	950	4,000	3,000
TOTALS	<u>15,904</u>	<u>19,862</u>	<u>13,544</u>

It should be noted that much of this habitat, even though of suitable age, has not been and probably will not be occupied by Kirtland's Warblers. Many of these stands, even to human eyes, lack characteristics of stand size, ground cover, stocking density and/or uniformity of height apparently preferred by this Warbler. Overall, less than 60 per cent of the "occupiable-aged" habitat on these public lands was known to hold Kirtland's Warblers in 1979 (stands totalling 8,900 acres were known to be used by Warblers, but in many cases only portions of these stands were occupied). This 8,900 acres of occupied habitat represents less than 7 per cent of the 128,000 acres of public land identified for Kirtland's Warbler management.

Additional occupiable habitat exists outside of the designated State and National Forest Management Areas. This additional acreage is included in the data presented below:

The following table shows present and projected total acreage estimates of habitable-aged jack pine lands, by ownership type, for the 11 county area comprising all of the known nesting* range for the Kirtland's Warbler:

<u>Ownership</u>	<u>Apparently-Occupiable In 1979 (Acres)</u>	<u>Occupiable-Aged In 1984 (Acres)</u>	<u>Occupiable-aged In 1989 (Acres)</u>
State of Michigan-Management Areas	11,017	10,474	4,618
State of Michigan-Military Lands	950	4,000	3,000
State of Michigan-Outside Management Areas	600	600	600
U.S. Forest Service-Management Areas	3,937	5,388	5,926
U.S. Forest Service-Outside Management Areas	400	400	400
Private-Within State of Michigan Management Areas	700	700	700
Private-Outside State of Michigan Management Areas	200	650	650
Private-Within Huron Nat'l Forest	0	0	0
TOTALS (Maximal)	17,804	22,212	15,794

*Presence of female Kirtland's Warblers was not determined for the Wexford County site recently occupied by male warblers; and no females could be found associated with the male warblers recently observed in Ontario, Quebec or Wisconsin.

Upon initial examination of this table it would appear that suitable nesting habitat is not the major factor limiting the population of the Kirtland's Warbler. Closer evaluation of the data, however, indicates a situation that should be considered with deep concern.

Seventy five percent (157) of the singing males censused in 1979 were found within five large wildfire areas (Military Area, Fletcher Road, Damon, St. Helen and Muskrat Lake) and in that part of the USFS, Mack Lake Management Area regenerated in the mid 1960's with prescribed seed tree burning and supplemental planting. The acreage of occupiable-aged habitat in these six areas totals 7,010 acres - only 40 per cent of the 17,804 acres of occupiable-aged habitat present in these 11 counties. This disproportionate distribution suggests selection for quality of habitat, i.e. habitat of wildfire origin in habitat approximating the same. Much of the "occupiable-aged" habitat in these counties, even to human eyes, appears to be very different from that of wildfire origin and will probably not be utilized by nesting Warblers.

Based on recent trends, the amount of Warbler habitat created by wildfire will continue to decline. As this "quality" habitat diminishes, we will need to rely heavily on habitat created in designated Management Areas. Hopefully, research will provide more definitive information on optimal nesting habitat conditions and the minimal tolerance levels for occupied nesting habitat. Until more information is available, it is imperative that every effort be made to create high quality habitat, that will closely simulate areas of wildfire origin.

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HABITAT MANAGEMENT SCHEDULE

Huron-Manistee National Forest

(Pages 27 - 384)

This Section available from Forest Supervisor, Huron-
Manistee National Forest, Cadillac, Michigan.

PLAN REVISION AND UPDATE

I. Introduction

The Kirtland's Warbler Habitat Management Plan is a guide. The cutting and treatment schedule has been designed to put warbler habitat management on an area regulation basis. The ages and densities of the present stands have been carefully considered to avoid as much loss in commercial pulpwood production as possible in the first rotation.

It is designed to provide, on a continuing basis, possible nesting habitat for the Kirtland's Warbler. If the schedule is followed, it will provide, in perpetuity, a continuous flow of suitable sized jack pine within each warbler Management Unit.

However, future changes in values, numbers of Kirtland's warblers, knowledge of nesting habitat requirements, management techniques, ownership patterns, and jack pine age distribution due to wildfire, jack pine budworm damage, windthrow and other unforeseeable occurrences, require flexibility in the Plan.

II. General Decennial Revision

The Plan is to undergo scrutiny for general revision every ten years. Each warbler Management Unit shall be examined for possible changes. The primary people responsible for review of the Plan are the biologist in charge of endangered species and, in the case of State Forest lands, the district planner. This revision should be carried out at the beginning of each decade, for example 1990, 2000, etc. In the case of the Forest Service, revision of this Plan should occur concurrent with the periodic revision of the Forest Land Management Plan.

III. Revision After Unplanned Changes in Management Units

The Plan is designed to provide a continuous supply of habitat suitable for nesting within each Management Unit. However, unforeseen circumstances are likely to interfere with the scheduled area regulation. Such circumstance may be wildfire, windthrow and insect damage. In order to keep the Plan functioning in an area regulation mode, it is essential that provision be made for bringing an affected Management Unit back to area regulation.

Listed below is a set of guidelines to be followed to achieve area regulation following some event which has caused the loss of area regulation.

1. The primary objective is to provide a continuous supply of habitat suitable for Kirtland's warbler nesting within each Management Unit.

2. Area regulation will be on a Management Unit basis.
3. The Management Unit(s) affected will be assigned a new treatment schedule within one (1) year of the event which caused a change in jack pine age distribution.
4. Any Management Unit which has at least one Cutting Block which has had an age class change in at least 30 percent of the Block must be considered for rescheduling.
5. Where more than one Management Unit is affected, the scheduling may involve the changing of existing Management Unit boundaries; however, such changes should be made only to prevent significant loss of a continuous supply of habitat or to prevent significant loss of timber, which might occur if the Unit boundaries were not changed.
6. Each Management Unit will contain five (5) Cutting Blocks where enough suitable potential habitat exists to afford five Blocks.
7. Cutting Blocks are to be 200 to 320 acres in size. Occasional exceptions are permitted in size if need be, but in no case will a Cutting Block be permitted to be less than eighty (80) acres.
8. Cutting Blocks are to be at least one-quarter (1/4) mile wide.
9. Cutting Blocks are not to be designed so as to have paved roads or heavily traveled gravel roads running through them.
10. As much as possible, boundaries of Cutting Blocks are to be natural (streams, lakes, non-habitat types) or follow easily recognizable man-made factors (survey section, quarter or eighth lines, roads).
11. Management Unit boundaries should not cross administrative unit boundaries.
12. Stands may be scheduled for cutting or treatment featuring either the overstory or understory with maximum timber production the determinant, within the framework of achieving the primary objective.
13. A Management Unit will be entered every ten (10) years with treatment being carried out in a new Cutting Block at each entry. When the full complement of five (5) Blocks has been entered, the first Block in the series will be re-entered.

14. In developing the cutting schedule, consider these social factors:
 - a. settlements; subdivisions
 - b. historic sites
 - c. recreational use
 - camp and picnic sites
 - Off-road vehicle (ORV) use
 - formal, informal
 - dedicated trails
 - d. mineral rights
 - e. oil and gas wells and rights-of-way
 - f. influence zones
 - g. special uses
15. Cutting Blocks are to be drawn so as to 1) maximize habitat over the long term, 2) provide a continuous supply of nestable-aged jack pine, and 3) maximize timber production given 1 and 2 above.
16. Maximization of timber production means striving to achieve, on a continuous basis, the greatest volume of timber in a forty-five (45) to fifty (50) year rotation.

BIG CREEK KIRTLAND'S WARBLER MANAGEMENT AREA

Oscoda County
T27N, R1E and T28N, R1E

Forest Inventory Compartments

Au Sable State Forest, Mio Area:	6	(Management Unit 1)
	21	(Management Unit 2)

Area Description

A. General Location and Background Information

The Big Creek Kirtland's Warbler Management Area is located in the extreme northwest corner of Oscoda County. This Area is less than 2 miles in width from east to west and about 6 miles long being bordered on both the east and west sides by branches of Big Creek. Potential habitat areas in Management Unit 2 are somewhat scattered due to private ownership and occurrence of better soils. Management Unit 1 is a contiguous area of potential habitat. The north portion of this Area in Sections 7 and 18 is very flat with soils typed as gravelly phase Grayling sand while the remainder of the Area is Grayling sand and only slightly rolling. Very little red pine planting has occurred in this Area and stands consist of nearly pure jack pine with scattered red pine and oak. In the northernmost 2 sections aspen clones are beginning to invade.

B. Land Ownership Patterns

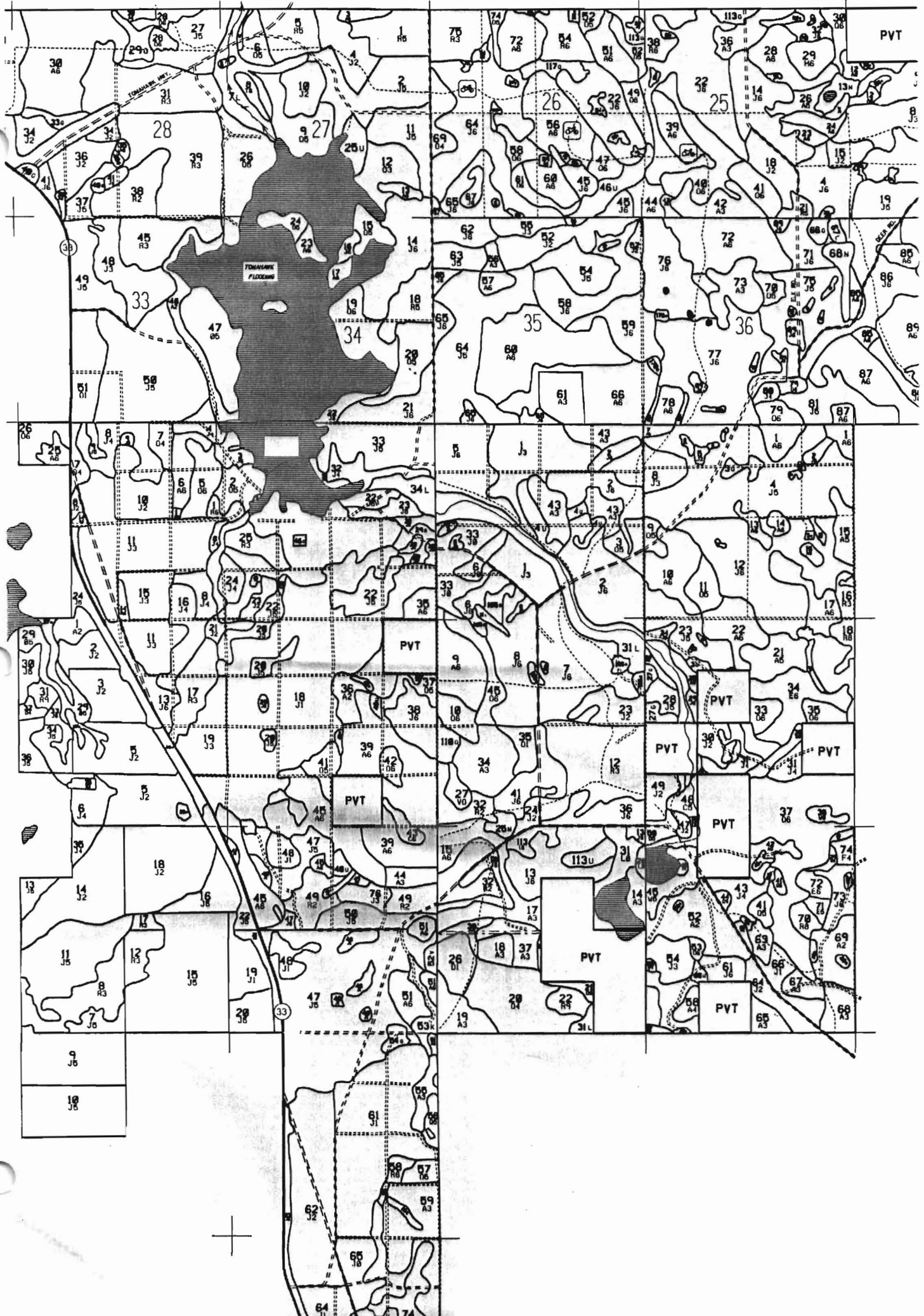
A number of privately owned parcels lie within and adjacent to potential habitat in this Area. Acquisition of at least some of these parcels is desirable for more efficient management.

C. Other Resources

This Area receives light to moderate human use even though there are no paved roads through the Area. There is an "unofficial" campground at Pickerel Lake near the west side of this Area. It receives considerable human use. Off-road vehicle (ORV) use of this Area is moderate. The ROLL snowmobile trail passes through a portion of the area. The Lakehead pipeline passes through both Management Units but its presence poses few management problems. Some subdivision and building of part-time residences has occurred on certain private lands, but construction is of limited extent at the present time.

D. Kirtland's Warbler Occupancy History

Although not reported in official censuses, there are reliable reports of at least 3 singing males occupying a 30-acre tract in the north part of the Area in the early 1950's.



BIG CREEK KIRTLAND'S WARBLER MANAGEMENT AREA

Oscoda County
T27N, R1E and T28N, R1E

Inventory Compartments:

Au Sable State Forest, Mio Area:	6	(Management Unit 1)
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- B. Land ownership patterns: A number of privately owned parcels lie within and adjacent to potential habitat in this Area. Acquisition of at least some of these parcels is desirable for more efficient management.
- C. Status of other resources: This Area receives light to moderate human use even though there are no paved roads through the Area. There is an "unofficial" campground at Pickerel Lake near the west side of this Area. It receives considerable human use. Off-road vehicle (ORV) use of this Area is moderate. The ROLL snowmobile trail passes through a portion of the area. The Lakehead pipeline passes through both Management Units but its presence poses few management problems.
- Some subdivision and building of part-time residences has occurred on certain private lands, but construction is of limited extent at the present time.
- D. Kirtland's warbler occupancy history: Although not reported in official censuses, there are reliable reports of at least three singing males occupying a 30-acre tract in the north part of the Area in the early 1950's.

BIG CREEK AREA

Oscoda County

Management Unit 1. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1979	22,26	J0	Already cut	97
		23,25,27	J6	51	91
		24	<u>J6</u> J2	<u>57</u>	53
		20	<u>J5</u> J3	<u>51</u>	63
		21	<u>J4</u> J3	<u>30</u> 20	43
		TOTAL			

Comments: This block is in the process of being cut. Following cutting it should be burned and planted to jack pine.

2	1989	17	J6	60	117
		29	<u>J4</u> J2	<u>58</u> 28	11
		18	J3	35	30
		30	G		5
		28	<u>J6</u> J1	<u>59</u>	15
		19	<u>J4</u> J2	<u>63</u> 33	<u>14</u>
TOTAL				192	

Comments: Site indexes in this block approach 50. Therefore, following cutting the block must be burned with a hot fire.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	1999	8	$\frac{J4}{J2}$	$\frac{64}{29}$	103
		9	J3	49	57
		10	$\frac{J4}{J2}$	$\frac{54}{40}$	24
		7	R7J4		8
		4	J6	64	52
		2	$\frac{J5}{J2}$	$\frac{72}{54}$	<u>18</u>
TOTAL					262

Comments: Some overstory may be taken off prior to 1999. However, in 1999 the entire Block must be burned and regenerated to jack pine.

*4	2009	11	J6	52 ← $\frac{82}{49}$	12
		31	$\frac{J5}{J2}$	52 ← $\frac{82}{49}$	171
		1	G		12
		3	$\frac{04}{J2}$	$\frac{44}{44}$	<u>30</u>
TOTAL					277

Comments: Mature jack pine and oak may be removed prior to 2009. In 2009 the entire Block must be burned and regenerated to jack pine.

*5	2019	15	$\frac{J4}{J2}$	54 ← $\frac{94}{51}$	122
		13	J5	54 ← 94	28
		12	J5R7	57 ← 97	15
		16	J1	64	45
		14	$\frac{J4}{J3}$	54 ← $\frac{94}{74}$	<u>46</u>
TOTAL					256

Comments: For the stands in the NW 1/4 of Section 5 the overstory and the trees now in the 50-year age class should be removed as soon as possible. This should be done to prevent the jack pine from becoming over-mature and to provide an even age class from the present understory. This understory is now ten to fifteen years old and if released may provide habitat for Kirtland's warblers. Special conditions such as minimum disturbance of the understory and removal of felled tops from the Cutting Block should be considered.

Management Unit 2. Y.O.E. --- 1

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*1	1981	1	J2	11	100
		4	J2	30	25
		3	J2	30	14
		2	J6	56	65
		5	<u>J4</u> J2		<u>10</u>
				TOTAL	214
				Private	<u>54</u>
				TOTAL	268

Comments: This could be a good warbler area but action must soon be taken to cut the J6 and J2 stands. The J6 stand has already reached its pathological rotation. Cut the 30-year J2 stands at the same time. Burn the entire Block, including the current 8-year-old J2 stand. Plant the entire Block. The private 54 acres west and south of Farrington Road may also be planted at this time if a cooperative agreement can be made with the landowner.

To minimize loss, this work should be done immediately. Note, however, that the Area Forester at this time objects to burning the 8-year-old J2 stand due to the investment already made.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
2	1991	10	<u>J6</u> J1	<u>61</u>	115
		9	<u>J4</u> J2		10
		8	<u>J4</u> J2	<u>65</u> 35	29
		7	J6	66	22
		6	J2		10
		11	G		<u>8</u>

*3	2001	12	<u>J5</u> J3	54 ← <u>74</u> 54	185
		13	R7		9
		17	J3	57	18
		16	J2	47	14
		21	G		5
		22	Misc.		<u>5</u>

Comments: The overstory may be taken off of the J5/J3 stand prior to 2001. Nineteen eighty-one is suggested. In 2001 the entire Block must be cut, burned with a hot fire, and regenerated to jack pine.

*4	2011	14	<u>J5</u> J3	54 ← <u>84</u> 64	137
		15	J2	66	<u>19</u>
				TOTAL	156

Comments: The overstory of the J5/J3 stand may be taken off in 1981 simultaneously with that in Cutting Block 3. The entire Block 4, however, must be cut, burned and regenerated with jack pine for the 2011 year-of-entry.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2021	18	J6 J2	61 ← 91 45 ← 75	33
		20	J2	60	95
		19	J4 J2	52 ← 82 71	42
			Misc.		16
TOTAL					186

Comments: This Cutting Block has relatively high site indexes ranging from 48 to 55. In addition, considerable aspen is invading in the shaded area and in the north half of the J6/J2 stand.

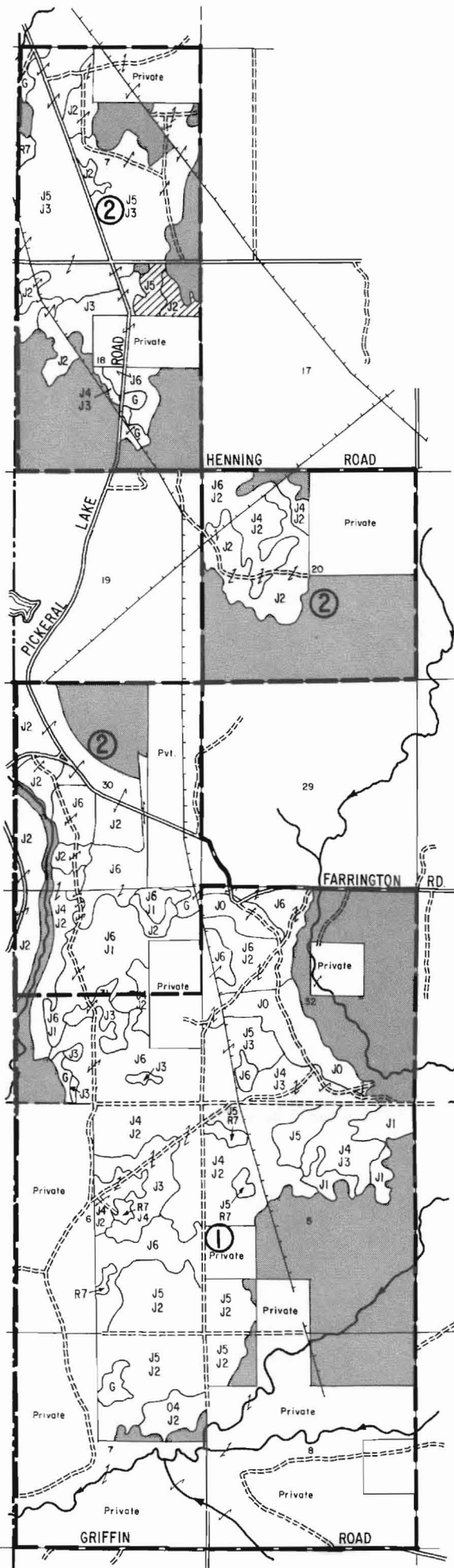
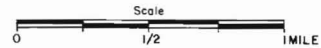
The dual purposes of harvesting timber from pathologically delining stands and of stemming aspen invasion should be attempted by applying Tordon or some other acceptable silvicide to the aspen clones followed by cutting of all species other than aspen (unless mortality of the clones is certain), and then followed by a hot burn during late July or August. The stands to the north of the power line and those shaded should receive this treatment. It is recommended that this action be taken not later than 1991.

Jack pine may or may not be planted or seeded following the burn. However, the entire Block must be cut, burned with a hot fire (preferably in late July or August) and regenerated to jack pine for the 2021 year of entry. The J4 component of the J4/J2 stand may be removed when the above mentioned stands are clearcut.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

BIG CREEK AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

OSCODA COUNTY, MICHIGAN
T 27 and 28 N, R 1 E



TYPE CLASSIFICATION

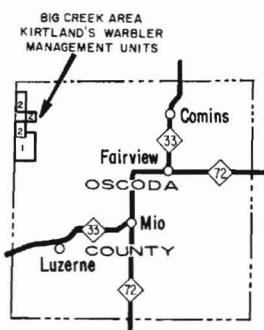
- O - Oak - red, white or black
- J - Jack Pine
- R - Red Pine
- G - Upland Grass

STAND SIZE and STOCKING

- Reproduction
 - 1 - low
 - 2 - medium
 - 3 - high
- Pole Timber
 - 4 - low
 - 5 - medium
 - 6 - high
- Saw Timber
 - 7 - low
 - 8 - medium
 - 9 - high

- NOT WARBLER HABITAT
- MARGINAL HABITAT
- COMPARTMENT BOUNDARY

TWP Boundary





*28N
32, 31, 30, 29
18, 19, 20
7*

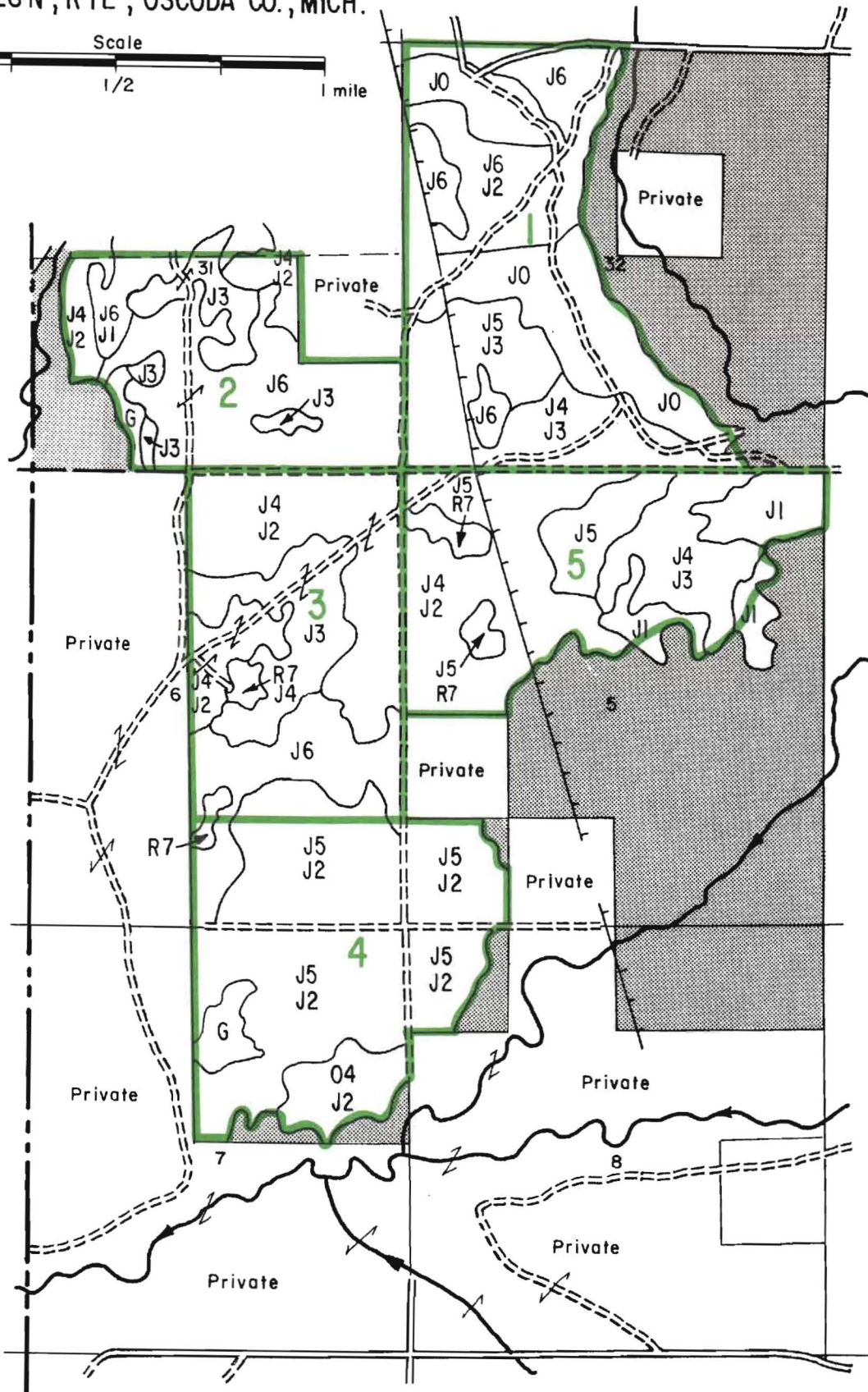
27N

BIG CREEK AREA KIRTLAND'S WARBLER MANAGEMENT UNIT (COMPARTMENT NO. 1)

CUTTING BLOCKS-Compartment 1

-  Not habitat
-  Marginal habitat

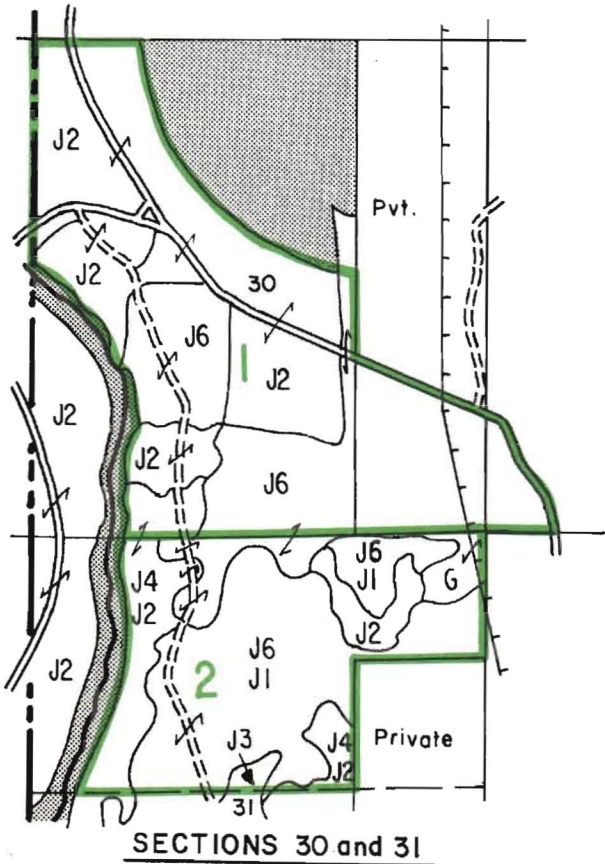
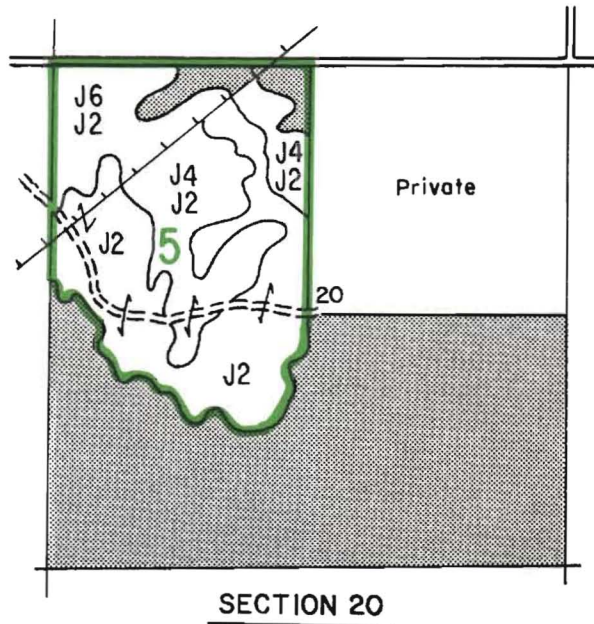
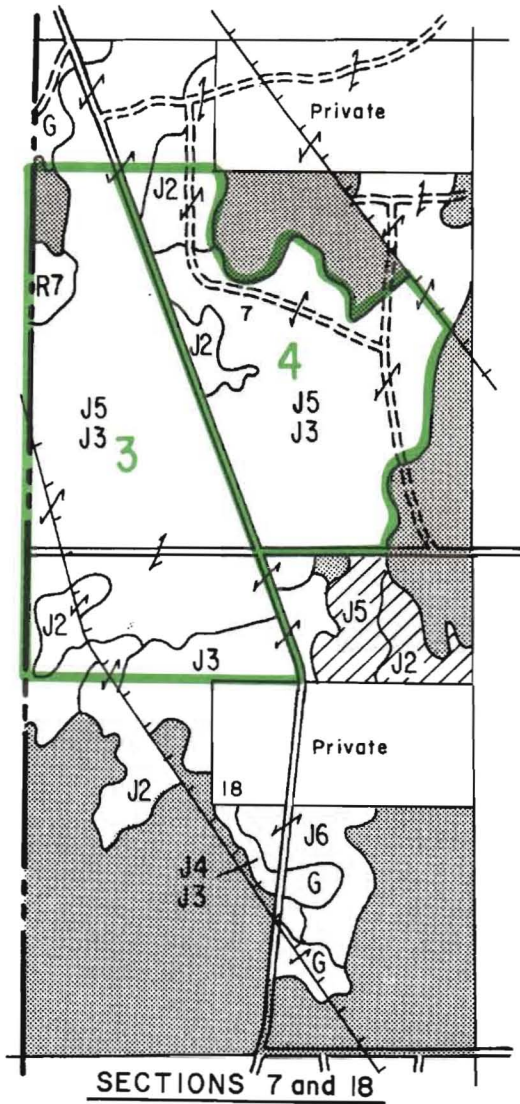
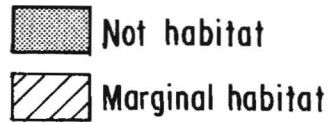
T 27 and 28 N, R 1 E; OSCODA CO., MICH.



CUTTING BLOCKS - Compartment 2

**BIG CREEK AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 2)**

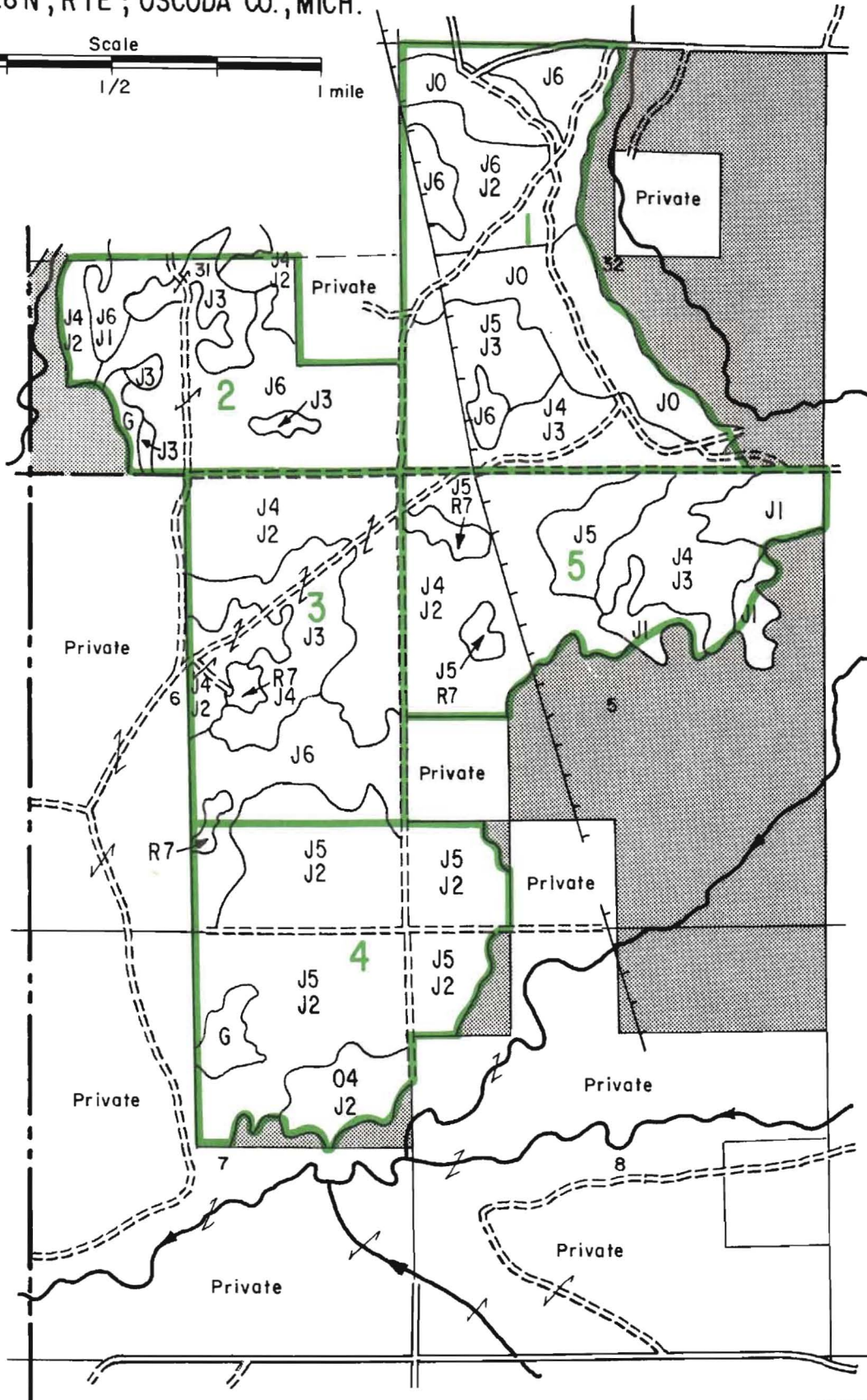
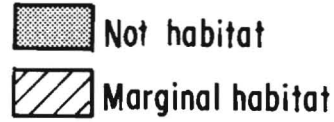
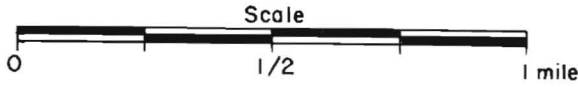
T 28N, R 1E; OSCODA CO., MICH.



BIG CREEK AREA KIRTLAND'S WARBLER MANAGEMENT UNIT (COMPARTMENT NO. 1)

CUTTING BLOCKS - Compartment 1

T 27 and 28 N, R 1 E; OSCODA CO., MICH.





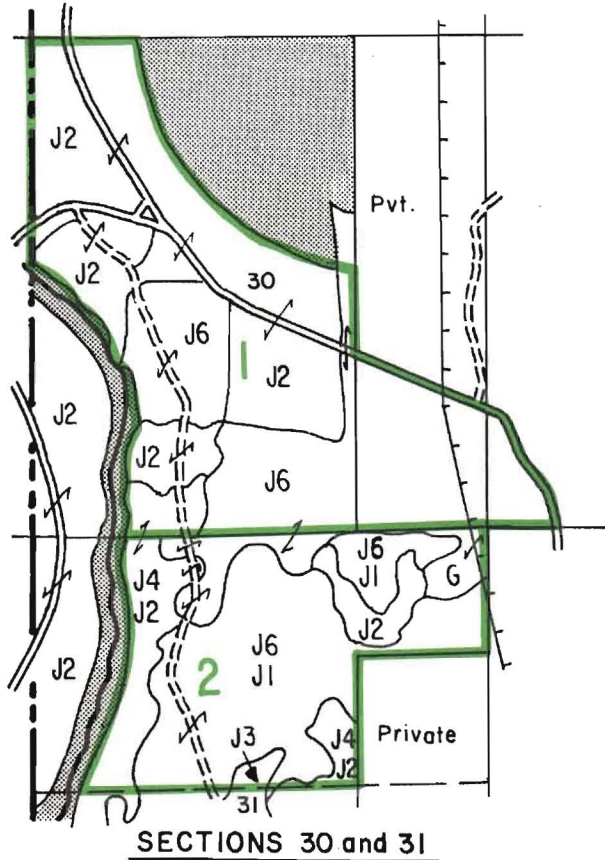
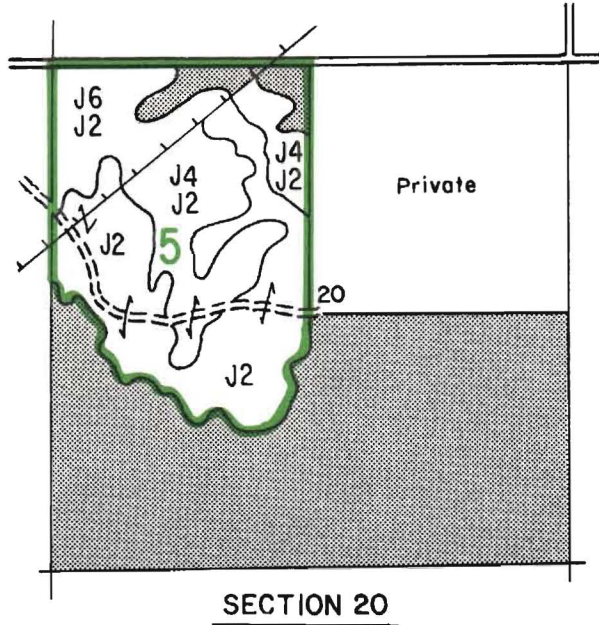
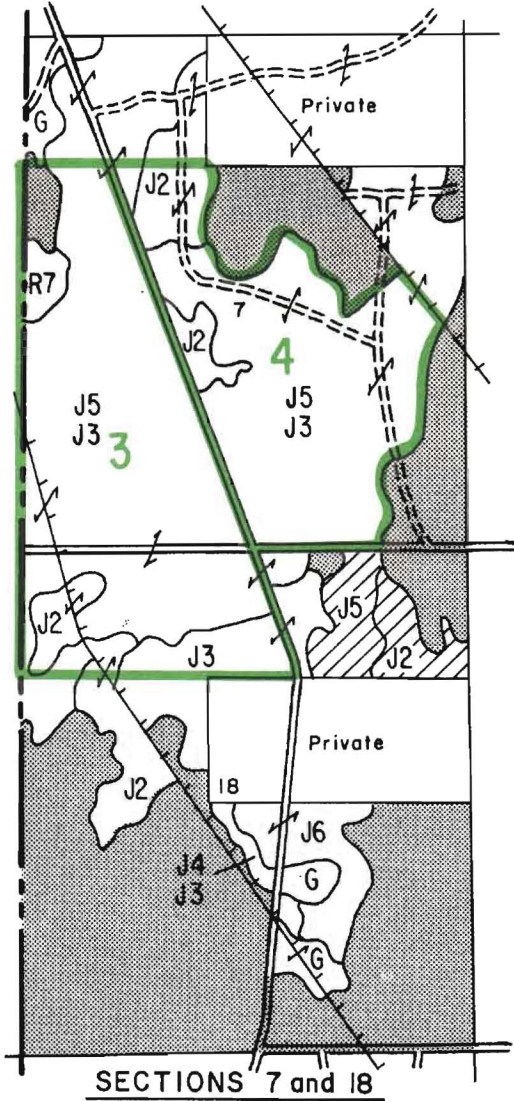
CUTTING BLOCKS - Compartment 2

**BIG CREEK AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 2)**

T 28N , R 1E ; OSCODA CO. , MICH.



-  Not habitat
-  Marginal habitat



LEOTA KIRTLAND'S WARBLER MANAGEMENT AREA

Clare County
T20N, R5W and T20N, R6W

Inventory Compartments:

Au Sable State Forest, Gladwin Area:	6	(Management Unit 1)
	7	(Management Unit 2)
	10	(Management Unit 3)
	9	(Management Unit 4)

Area Description

- A. General location and background information: The Leota Kirtland's Warbler Management Area is located just southwest of the town of Leota in Clare County. The county seat, Harrison, lies ten miles to the southeast of the Area. The topography is flat to hilly with the Muskegon River bisecting the Management Area. Habitat is limited by the more hilly areas which generally support oak and aspen associations and by the river valley.

Prescribed burning must be carried out in the Cutting Blocks of Management Unit 3 and the designated blocks of Management Units 2 and 4 (see Treatment Schedule). In the other Blocks, burning is desirable. Some Blocks also contain small aspen clones. these clones should be treated to prevent their spreading.

- B. Land ownership patterns: The pattern of land ownership provides a major obstacle to additional management for Kirtland's Warblers. The private parcels have excellent warbler habitat potential. If most of this private land could be purchased, an additional Management Unit could be created as well as increasing the size of some of the existing Cutting Blocks.

While most of the private parcels vary from forty acres to over one half section, there are portions of it which have been subdivided into small acreages. This situation could make acquisition more difficult.

- C. Status of other resources: Visual impact should not be a major concern since no major roads pass through the area. Some consideration should be given, however, to visual impact along County Road 1233, a gravel road which runs through the Leota Kirtland's Warbler Management Area.

Of major concern is the gas injection well field, operated by the Michigan Gas Storage Company of Marion, Michigan, which occurs over more than half of this warbler Management Area. Operations at the many well sites and activity on the road network linking the wells may cause some disturbance to nesting birds. The wells themselves may pose problems to prescribed burning, although an official of the Company felt that burns could be permitted since pipelines are 30 inches underground and cleared areas are maintained around the injection wells.

Running through T20N R5W, sections 6, 7, 18, 19, 30 and 31 is the Great Lakes Gas Transmission Company line. At present, one oil and four gas pipelines run through this leased corridor. No problems are envisioned due to the presence of this line, but extra care and consultation with the Company may be necessary prior to prescribed burning. Several oil wells exist in the Area.

- D. Kirtland's warbler occupancy history: Kirtland's Warblers were reported in this area in 1920. Although not recorded, it is also quite likely that Kirtland's occupied the Leota Area in the 1930's and 1950's when large stands of habitable-aged jack pine existed in the area.

LEOTA AREA

Clare County

Management Unit 1. Y.O.E. --- 6

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
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*1	1986	1	J0	No Treatment	<u>211</u>
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TOTAL					211
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Comments: This entire Block was burned by a wildfire in 1977. This Block should be watched for natural jack pine regeneration. Perhaps supplemental planting will be required which may be accomplished prior to 1986. Stand 12 of Cutting Block 5 should be regenerated with Block 1.

2	1996	2	J4R4	60	78
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		3	J4J2	54	118
--	--	---	------	----	-----

		4	J4R4	61	46
--	--	---	------	----	----

		5	J5R4	58	<u>38</u>
--	--	---	------	----	-----------

TOTAL					280
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3	2006	6	<u>J4</u> J2	<u>56</u>	280
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		7	<u>R4J4</u> J1	<u>60</u>	12
--	--	---	-------------------	-----------	----

		8	J3	59	20
--	--	---	----	----	----

		9	<u>J4</u> J2	<u>44</u>	<u>7</u>
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TOTAL					319
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<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2016	10	$\frac{J4}{J2}$	$\frac{54}{}$	129
		11	R5J5	← 82	<u>102</u>
TOTAL					231

Comments: The jack pine could be removed from Stand 11 prior to 2016 to improve the red pine.

*5	2026	12	J0	46	154
		13	$\frac{O4}{J2}$	← $\frac{73}{}$	49
		14	J4J2	73	66
		15	$\frac{J5O4}{J2}$	← $\frac{73}{}$	27
		16	r5J4	← 91	<u>8</u>
TOTAL					304

Comments: If desirable, the overstories may be removed from Stands 13 and 15 as soon as desirable.

Stands 13, 14, 15 and 16 may need to be cut prior to 2026. The entire Block, however, must be regenerated in 2026.

Management Unit 2. Y.O.E. --- 5

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1985	1	J4J2	39	38
		2	<u>J5</u> J2	<u>61</u> 25	20
		3	J404	49	7
		4	J5	59	52
		5	J201W1	16	<u>25</u>
				TOTAL	142

Comments: This block should be burned, especially Stand 5 to continue the jack pine type.

*2	1995	6	<u>J604</u> J2	63 ← <u>73</u> 41	47
		7	J2	43	120
		8	J3	48	9
		9	J4J3	50	12
		10	<u>J504</u> J2	<u>?</u> 47	29
		11	J404	59	11
		12	J302	46	13
		13	J4J3	46	<u>39</u>
				TOTAL	280

Comments: The mature and overmature jack pine and oak may be cut from Stand 6 when Block 1 is cut, or possibly sooner.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2005	14	$\frac{J4}{J2R1}$	$\frac{59}{}$	81
		15	$\frac{J4R4}{J2}$	← $\frac{72}{62}$	18
		16	$\frac{J4}{J2}$	← $\frac{72}{64}$	<u>61</u>
TOTAL					160

Comments: Older jack pine may be removed prior to 2005. The periphery of this Block tends to be of marginal potential for Kirtland's Warblers. Therefore, a prescribed burn may be necessary.

*4	2015	17	J4J2	← 72	37
		18	J2O4	67	14
		19	$\frac{J4R4}{J2}$	$\frac{77}{57}$	78
		20	J3	47	40
		21	$\frac{J4}{J1}$	$\frac{57}{}$	<u>16</u>
TOTAL					185

Comments: Some jack pine may be removed prior to 2015. In 2015, this Block should possibly be burned and then regenerated to jack pine.

*5	2025	23	J3	57	40
		24	$\frac{J4}{J2}$	$\frac{62}{}$	76
		25	J4J3	72	74
		26	J3	62	<u>10</u>
TOTAL					200

Comments: Some jack pine may be removed prior to 2025; however, the entire Cutting Block should be regenerated in 2025.

Management Unit 3. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1983	1	<u>J6</u> <u>O2</u>	<u>57</u>	33
		2	<u>J4O4</u> <u>J2</u>	<u>57</u> 30	8
		3	J4R4J3	38	19
		4	J3	25	12
		5	R3	27	8
		6	<u>J4</u> <u>J2</u>	<u>55</u> 23	93
		7	<u>J4</u> <u>J3</u>	<u>53</u> 30	18
		8	J6	53	<u>22</u>
TOTAL					213

Comments: This Block appears to have only marginal potential for Kirtland's Warblers. Aspen clones exist in some stands. These should be killed with an acceptable silvicide such as Tordon or Amdon prior to harvesting the Block. A hot fire in July or August is then recommended to control the spread of deciduous shrubs. Planting of jack pine should then be undertaken. If mutually agreed upon by forester and biologist, the young red pine planting (Stand 5) may be held from cutting until next rotation.

2	1993	9	<u>J4R4O4</u> <u>J2</u>	<u>52</u> 40	72
		10	<u>J6O4</u> <u>J2</u>	<u>68</u> 30	75
		11	<u>J6O4</u> <u>J1</u>	<u>65</u> 25	<u>33</u>
TOTAL					180

Comments: Aspen clones exist in parts of this Cutting Block. To prevent their spread, management should be similar to that recommended for Cutting Block 1.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	2003	22	J4J3	59	10
		23	O5		14
		24	<u>O7J4</u> J2	<u>58</u>	55
		25	J4J3	56	15
		26	<u>O4J4</u> J2	<u>57</u>	114
		27	J3	48	24
		28	J2	48	17
		29	J4J3	60	17
		30	J3	43	<u>14</u>

Comments: This Block should be burned with a hot fire, preferably in July or August, following cutting. Any aspen that may exist should be discouraged from spreading.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2013	12	<u>J4</u> J201	<u>45 through 65</u>	95
		13	J4J2	63	16
		14	O4		12
		15	<u>O7J4</u> J2	<u>67</u> 45	69
		16	G	(Oil & gas trans. ROW)	17
		17	R3	57	30
		18	J3	57	9
		19	<u>O7J4</u> J2	<u>67</u> 45	10
		20	J5	← 73	7
		21	J3	61	<u>11</u>

Comments: Aspen clones exist in parts of this Cutting Block. To prevent their spread and improve habitat potential for warblers, these should be controlled with an acceptable silvicide, followed by cutting, followed by a prescribed burn preferably in July or August.

Note that the Great Lakes Gas Transmission Company has a leased right-of-way through the middle of this Block. Management of this right-of-way will be per provisions of the lease.

5	2023	31	J2	58	29
		32	J3	65	22
		33	R4J4R2J2	78	145
		34	R5	81	<u>25</u>
				TOTAL	221

Management Unit 4. Y.O.E. --- 4

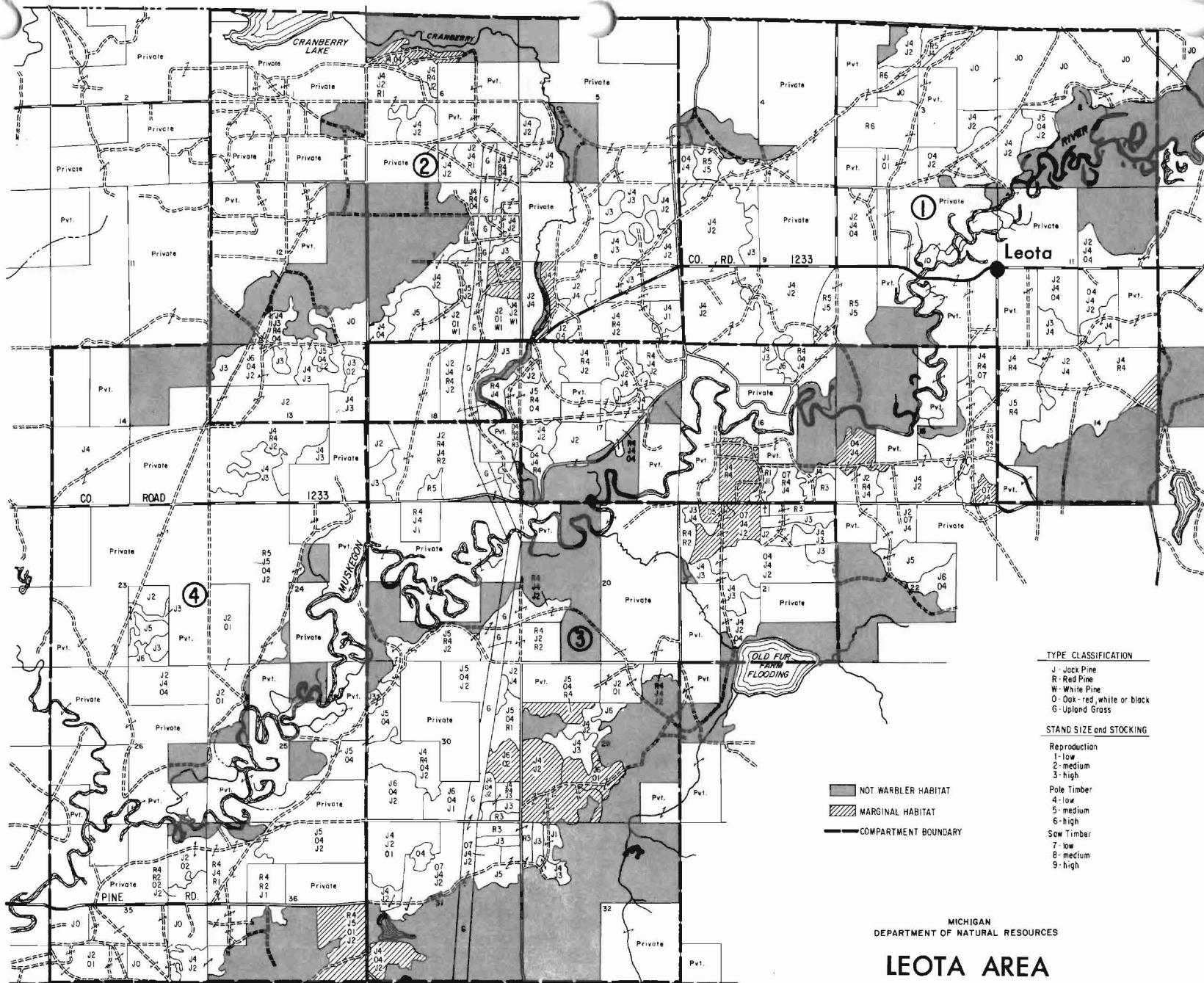
<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1984	12	J4	50	<u>160</u>
				TOTAL	160
2	1994	1	<u>R5J504</u> J2	<u>60</u> 41	<u>160</u>
				TOTAL	160
*3	2004	2	<u>J4R4</u> J2	← <u>68</u> 56	126
		3	J4J3	56	58
		4	J4J3	56	<u>16</u>
				TOTAL	200
<u>Comments:</u> The jack pine in Stand 2 may be removed prior to 2004.					
*4	2014	5	J201	59	133
		6	<u>R5J504</u> J2	← <u>90</u> (?) 61	<u>53</u>
				TOTAL	186

Comments: The jack pine and oak may be removed from Stand 6 prior to 2014 to prevent timber loss in those species and to provide greater growth of the red pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2024	7	J202	56	29
		8	<u>R4</u> R202J2	<u>76</u> 56	23
		9	<u>R4J4</u> R1	← <u>76</u> 66	62
		10	<u>R4</u> R2J1	<u>76</u> 56	40
		11	<u>J504</u> J2	← <u>89</u> 61	<u>17</u>
				TOTAL	171

Comments: Burn the Block following cutting. Jack pine may be removed from Stands 9 and 11 prior to 2024.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.



TYPE CLASSIFICATION
 J - Jack Pine
 R - Red Pine
 W - White Pine
 O - Oak - red, white or black
 G - Upland Grass

STAND SIZE and STOCKING
 Reproduction
 1 - low
 2 - medium
 3 - high
 Pole Timber
 4 - low
 5 - medium
 6 - high
 Saw Timber
 7 - low
 8 - medium
 9 - high

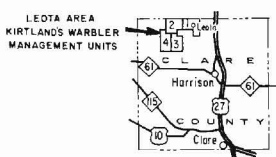
NOT WARBLER HABITAT
 MARGINAL HABITAT
 COMPARTMENT BOUNDARY

MICHIGAN
 DEPARTMENT OF NATURAL RESOURCES

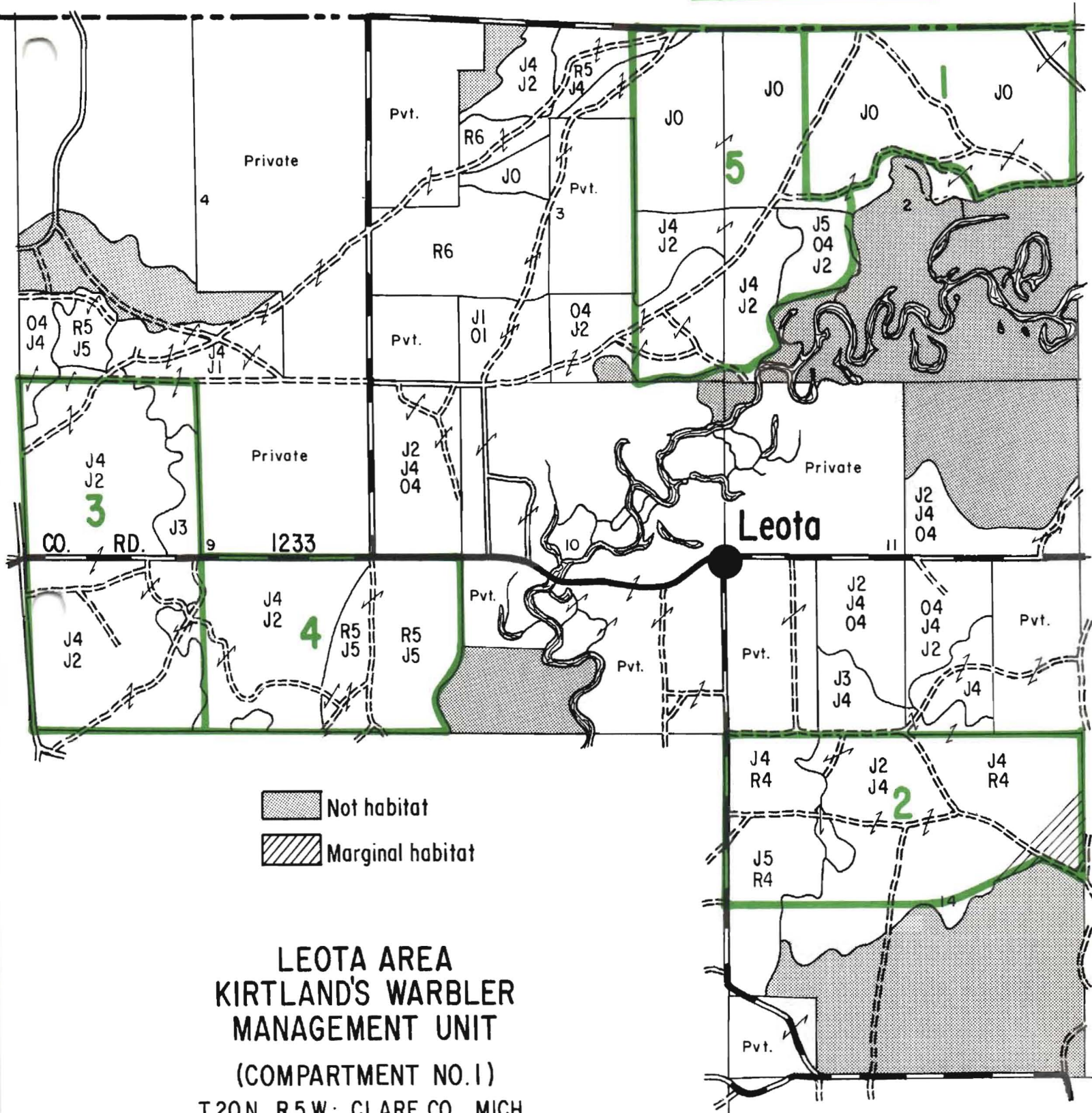
**LEOTA AREA
 KIRTLAND'S WARBLER
 MANAGEMENT UNITS**

CLARE COUNTY, MICHIGAN

T 20N, R 5&6W

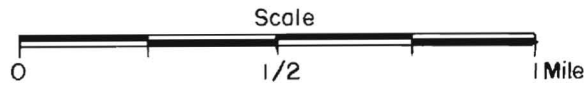


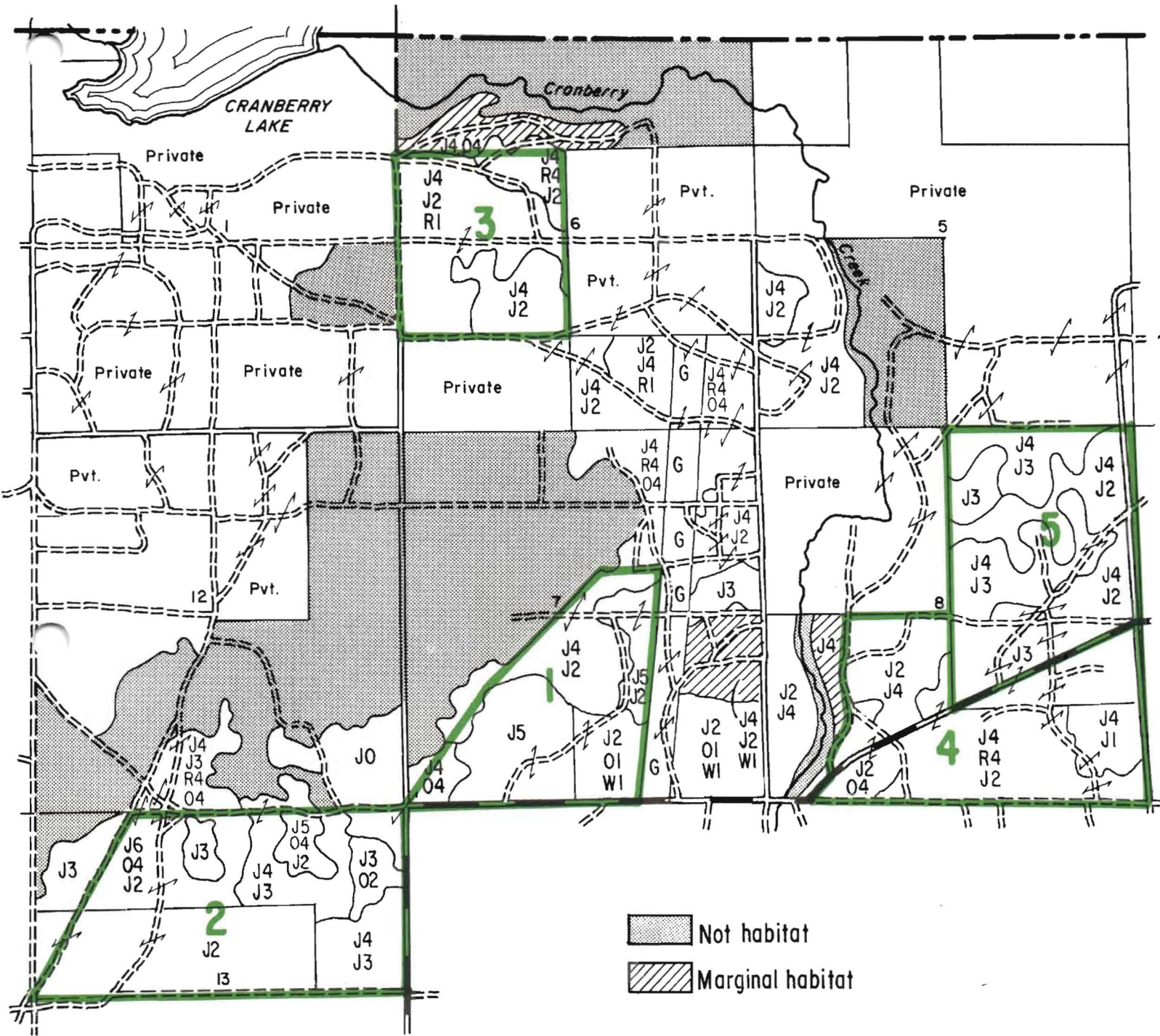
CUTTING BLOCKS
Compartment I



Not habitat
 Marginal habitat

LEOTA AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 1)
T 20N, R 5W; CLARE CO., MICH.



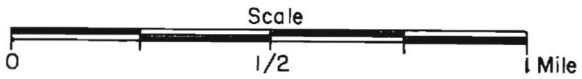


CUTTING BLOCKS
Compartment 2

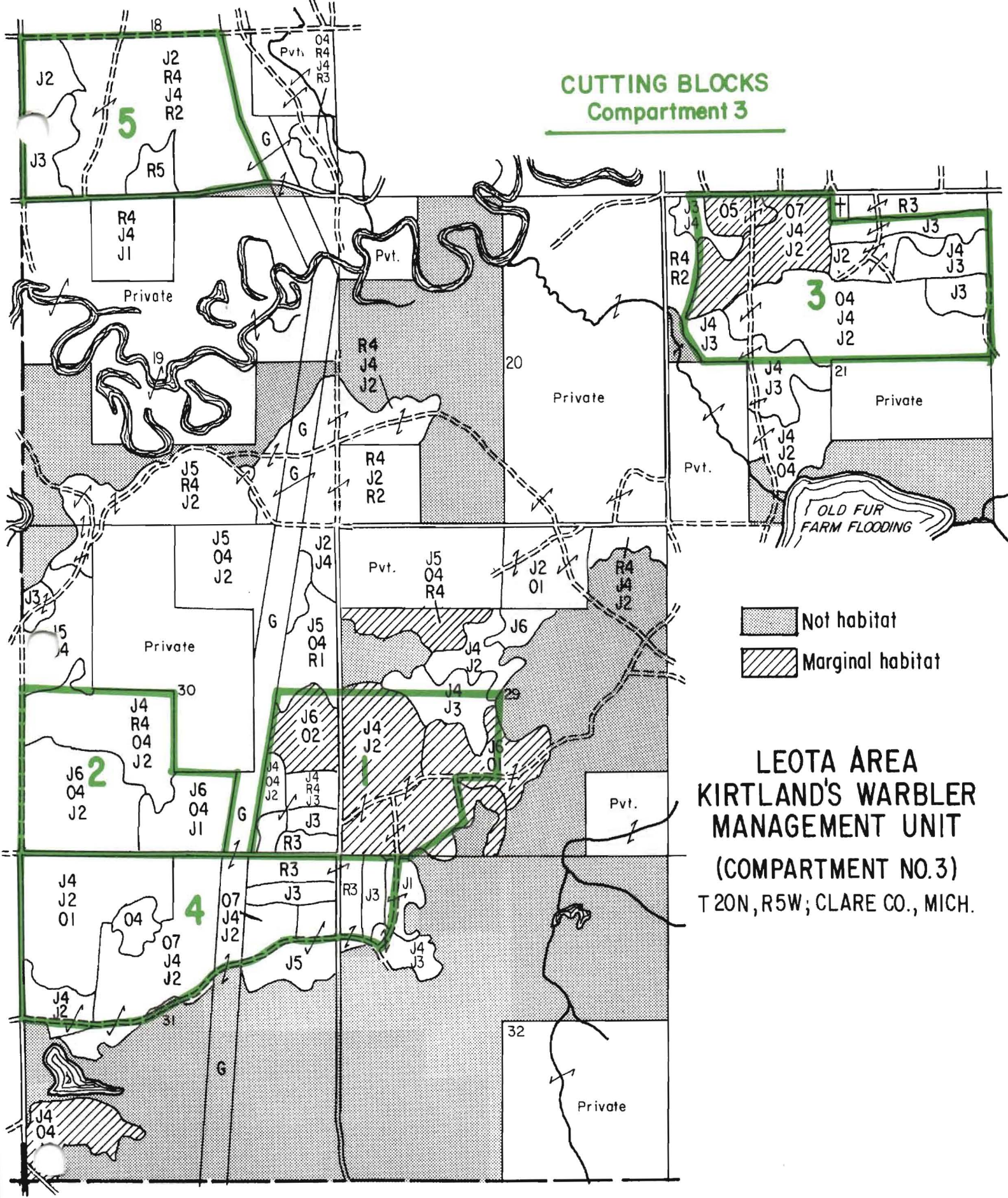
**LEOTA AREA
 KIRTLAND'S WARBLER
 MANAGEMENT UNIT**

(COMPARTMENT NO.2)

T 20N, R 586 W; CLARE CO., MICH.

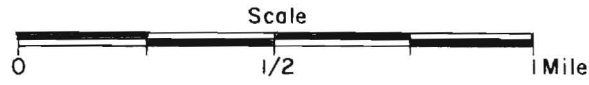


CUTTING BLOCKS
Compartment 3

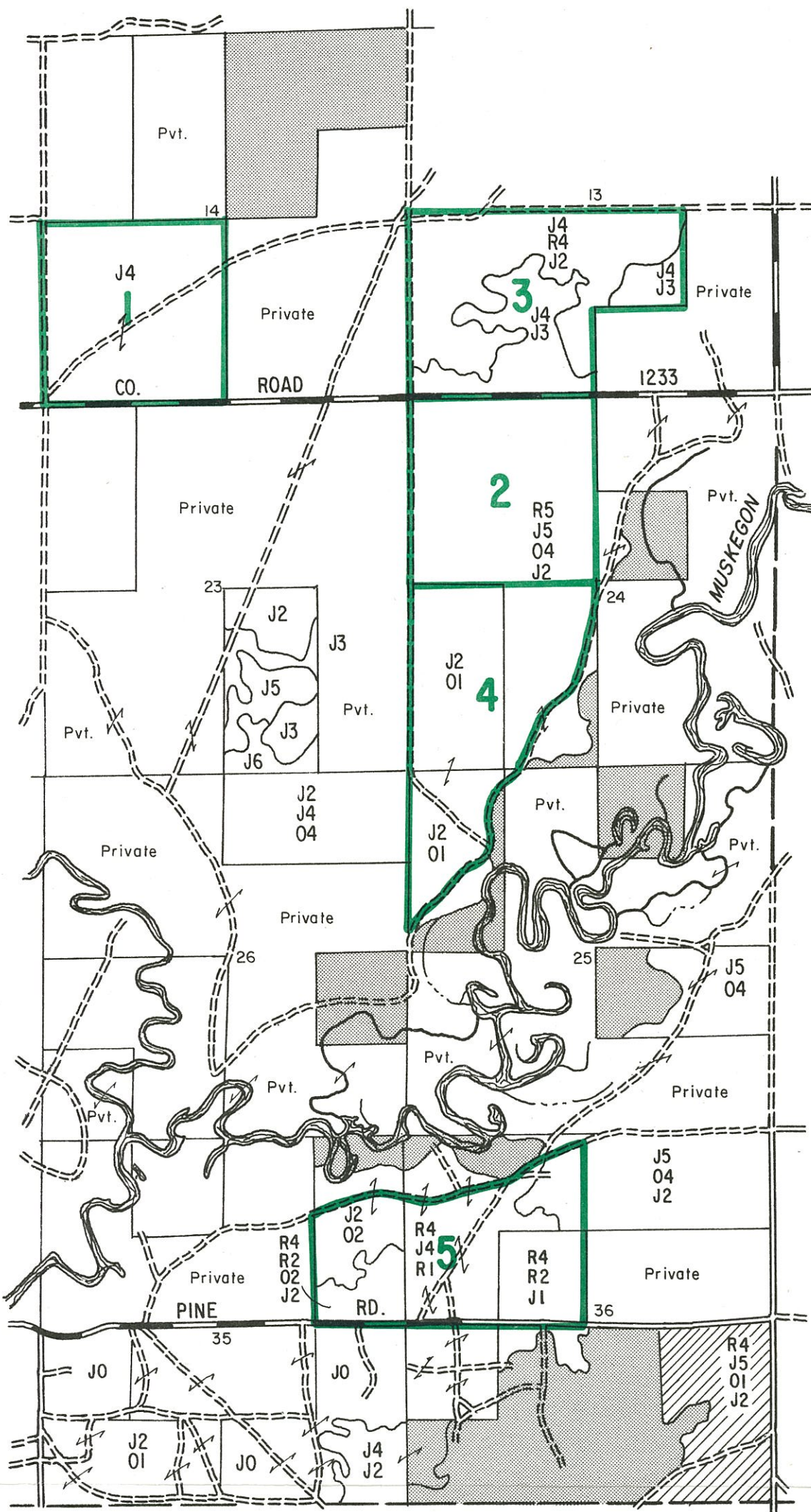




Not habitat
 Marginal habitat

**LEOTA AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 3)
T 20N, R 5W; CLARE CO., MICH.**

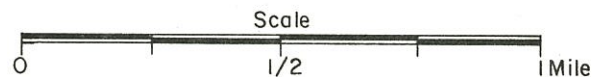


CUTTING BLOCKS
Compartment 4



 Not habitat
 Marginal habitat

LEOTA AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO.4)
T 20N , R 6 W ; CLARE CO. , MICH.



LOVELLS KIRTLAND'S WARBLER MANAGEMENT AREA

Crawford County
T28N R1W and T28N R2W

Inventory Compartments:

Au Sable State Forest, Roscommon Area:	272 (Management Unit 1)
	271 (Management Unit 2)
	291 (Management Unit 3)
	290 (Management Unit 4)
	270 (Management Unit 5)

Area Description

- A. General location and background information: The Lovells Kirtland's Warbler Management Area is situated in the northeast corner of Crawford County. It is an area in which the critical habitat is interspersed with nonhabitat primarily because of the influence of the drainage of the West Branch of Big Creek. It is bounded on the west by the North Branch of the Au Sable, on the east by the Middle Branch of Big Creek, on the south by moister soil conditions resulting from the drainages of the North Branch of the Au Sable and the Middle Branch of Big Creek, and on the north by the Crapo Lake Kirtland's Warbler Management Area in Otsego County.

In places the habitat potential appears excellent while in other places there is a tendency for conversion to aspen. These sites where aspen clones are finding a foothold tend to be slightly moister and support a slightly heavier brush component. These sites should be carefully managed to avoid conversion to non-habitat. Hot fires and the possible use of silvicides are recommended at the time of stand regeneration.

The Lovells Area has a long history of warbler use. In 1958 what is now part of Management Units 2 and 5 was planted to jack pine with the specific intention of managing the area for Kirtland's Warblers. This original "management area" has been incorporated into the Lovells Kirtland's Warbler Management Area and future management will follow as per the guidelines set up in this present Habitat Management Plan.

- B. Land ownership patterns: The area of potential habitat is fairly solid in State ownership. Private holdings do not present an obstacle to management.
- C. Status of other resources: No immediate conflicts are seen with other resource use in the Area. A small amount of informal trail bike riding takes place within the Area boundary.
- County Roads F-97 and 612 border and pass through this Area. The visual impacts of cutting must be considered along these routes.

- D. Kirtland's warbler occupancy history: The Museum of Zoology, University of Michigan, has 45 specimens collected in the Lovells Area. The earliest specimen was collected in 1925. Others were collected in 1930, 1931, 1932, 1933 and 1934. The 1951 and 1961 censuses both show birds in this Area. Presently there are 19 singing males in the Lovells Area (1979 census) in three different locations. This Area has a very strong history of providing nesting habitat for the warblers.

LOVELLS AREA
Crawford County

Management Unit 1. Y.O.E. --- 8

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1978	1	$\frac{J5}{J3}$	$\frac{54}{27}$	180
		2	J4	43	28
		3	$\frac{J4}{J2}$	$\frac{54}{27}$	<u>48</u>
TOTAL					256

Comments: Cut, burn in July or August to control the oak, then regenerate to jack pine. NOTE: See Cutting Block 4.

2	1988	4	$\frac{J4}{J2}$	$\frac{64}{37}$	47
		5	$\frac{J5}{J3}$	$\frac{64}{37}$	<u>183</u>
TOTAL					230

Comments: Cut, burn in July or August to control the oak, then regenerate to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	1998	6	$\frac{J4}{J2}$	$\frac{74}{47}$	10
		7	$\frac{J5}{J301}$	$\frac{57}{47}$	87
		8	$\frac{J5}{J2}$	$\frac{69}{53}$	50
		9	$\frac{J5}{J3}$	$\frac{67}{54}$	5
		10	J6	66	30
		11	J201		13
		12	$\frac{J5}{J301}$	$\frac{63}{53}$	95
			Misc.		<u>6</u>
				TOTAL	296

Comments: Cut, burn in July or August to control the oak, then regenerate to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>	
*4	2008	14	$\frac{J4}{J1}$	46 ← $\frac{76}{42}$	20	
		15	$\frac{J4}{J2}$	48 ← $\frac{78}{41}$	20	
		16	J6	53 ← 83	41	
		17	J2		11	
		18	$\frac{J4O4}{J2}$	43 ← $\frac{73}{41}$	46	
		19	J3	56	22	
		20	$\frac{J5}{J3}$	54 ← $\frac{84}{57}$	10	
		21	$\frac{J4}{J2}$	53 ← $\frac{83}{41}$	<u>58</u>	
		TOTAL				228

Comments: The J6 stand and the overstory of the indicated stands could be cut as soon as practical to prevent loss of fiber due to old age. It is suggested these trees be cut in 1978 as part of the sale which would cut Cutting Block 1.

*5	2018	22	G	38	376
		23	$\frac{J4}{J3}$	41 ← $\frac{82}{69}$ 28 ← 69	48
		24	J1	49	<u>8</u>
TOTAL				432	

Comments: In 1978-1980 the entire Block 5 should have the aspen clones killed with Tordon or some similar acceptable silvicide. The J4/J3 stands may then be cut followed by burning. Following these treatments, plant Block 5 to jack pine.

The above treatments should correspond to the recommended treatments for Management Unit 2. Block 5 will then again be entered in 2018 when the entire Block will be treated as a unit.

Management Unit 2. Y.O.E. --- 0

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*1	1980	1	J0		33
		2	G		<u>281</u>
TOTAL					314

Comments: Where enough fuel exists this Block should be burned and the entire Block should be planted to jack pine even prior to 1980 if possible. This work should be done in conjunction with similar practices, recommended for Blocks 4 and 5 of the Management Unit and Block 5 of Management Unit 1.

Patches of clonal aspen exist throughout this Cutting Block. Prior to burning, these should be killed with Tordon or some other acceptable silvicide to inhibit the spread or eventual conversion to aspen.

Summer or fall burning is recommended, with a summer burn necessary if the aspen is not treated.

2	1990	3	G		148
		4	<u>J5</u> <u>J2</u>	<u>41</u> <u>34</u>	29
		5	J3	43	15
		6	J2	35	<u>14</u>
TOTAL					206

Comments: Aspen clones within this Block should be treated with Tordon to inhibit their spread. After treatment, cut the stands. Following cutting, the Block should be burned with a hot fire.

July or August burning is recommended. The entire Block should then be regenerated to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	2000	7	<u>J4</u> J2	<u>54</u> 44	95
		8	G		139
		9	J2	55	41
		10	<u>J5</u> J3	<u>56</u> 48	<u>6</u>
			TOTAL		

Comments: As per those for Cutting Block 2.

*4	2010	11	J2	54	55
		12	J1		6
		13	G	30	<u>173</u>
TOTAL				234	

Comments: In 1978-1980 the G type should be planted to jack pine after treating the aspen with a silvicide. In 2010 treat the aspen, burn and regenerate to jack pine the entire Block.

*5	2020	14	G	40	150
		15	J2		20
		16	<u>J4</u> J3	<u>54</u> ← <u>74</u> 46 ← 66	14
			17	J3	57 ← 77
TOTAL				194	

Comments: In 1978-1980 treat the aspen clones through the use of silvicide. Then plant the G type to jack pine. In 2020 treat the aspen, burn, and regenerate to jack pine the entire Block.

Management Unit 3. Y.O.E. --- 2

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1982	1	<u>J504</u> J3	<u>58</u> 42	250
		2	<u>J4</u> J2	<u>52</u>	<u>55</u>
				TOTAL	305

Comments:

2	1992	3	<u>J5</u> J2	<u>70</u> 50	158
		4	J1	22	30
		5	J5	72	6
		6	J6	67	39
		7	<u>J4</u> J3	<u>59</u> 43	<u>123</u>
				TOTAL	356

Comments:

3	2002	8	J5	73	23
		9	J6	75	24
		10	J4 J3	60	180
		11	J1	44	<u>10</u>
				TOTAL	237

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
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4	2012	12	J4 J3	70	<u>298</u>
				TOTAL	298

Comments:

5	2022	13	J2	70	159
		14	J5 J3	75	29
		15	J4 J3	80	<u>49</u>
				TOTAL	237

Comments:

Management Unit 4. Y.O.E. --- 4

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1984	1	<u>J4</u> J1	<u>73</u>	107
		2	<u>J5</u> J301	<u>54</u> 42	<u>147</u>
				TOTAL	254

Comments: See Block 4, Management Unit 4, below.

2	1994	3	<u>J5</u> J201	<u>68</u> 54	<u>202</u>
				TOTAL	202

Comments:

*3	2004	4	J1	35	8
		5	<u>J4</u> J2	← <u>77</u> 38	49
		6	J6	← 95	34
		7	<u>J5</u> J301	← <u>74</u> ← 62	50
		8	<u>J5</u> J3	← <u>87</u> ← 60	<u>139</u>
				TOTAL	280

Comments: Overstory of the two-storied stands and the J6 stand may be cut 20 to 30 years before scheduled Block treatment. The entire block must be treated, however in 2004.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2014	9	<u>J4</u> J1	73 ← <u>103</u>	21
		10	<u>J5</u> J301	54 ← <u>84</u> 42 ← 72	<u>238</u>
TOTAL					259

Comments: Cut, burn and regenerate entire Block with Cutting Block 1 in 1984. Re-enter in 2014.

*5	2024	11	<u>04</u> J2	<u>60</u>	155
		12	J3	51	50
		13	<u>J5</u> J301	63 ← <u>109</u> 84	52
		14	<u>J4</u> J2	<u>68</u>	<u>14</u>
TOTAL					271

Comments: Oak will need to be controlled in this Block. The J5 overstory may be taken off prior to 2024.

Management Unit 5. Y.O.E. --- 6

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1986	1	J2	next rotation	13
		2	J2	next rotation	90
		3	J3	next rotation	157
		4	<u>J5</u> J3	<u>46</u> 33	21
		5	J6	43	<u>31</u>
TOTAL					312

Comments: This Cutting Block is currently providing nesting habitat for Kirtland's Warblers. No treatment is proposed for the 1986 year of entry. Cutting will be done for the first time at the beginning of the next rotation in 50 years. If desired, however, the J5/J3 stand and the J6 stand may be cut.

2	1996	6	J3	35	76
		7	J6	67	89
		8	<u>J504</u> J3	<u>63</u> 48	<u>91</u>
TOTAL					256

Comments:

2	2006	9	<u>J504</u>	<u>73</u>	<u>245</u>
			J3	58	
TOTAL					245

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2016	10	J2	64	68
		11	J2	51	81
		12	J3	54	125
		13	J6	73	<u>46</u>
TOTAL					320

Comments:

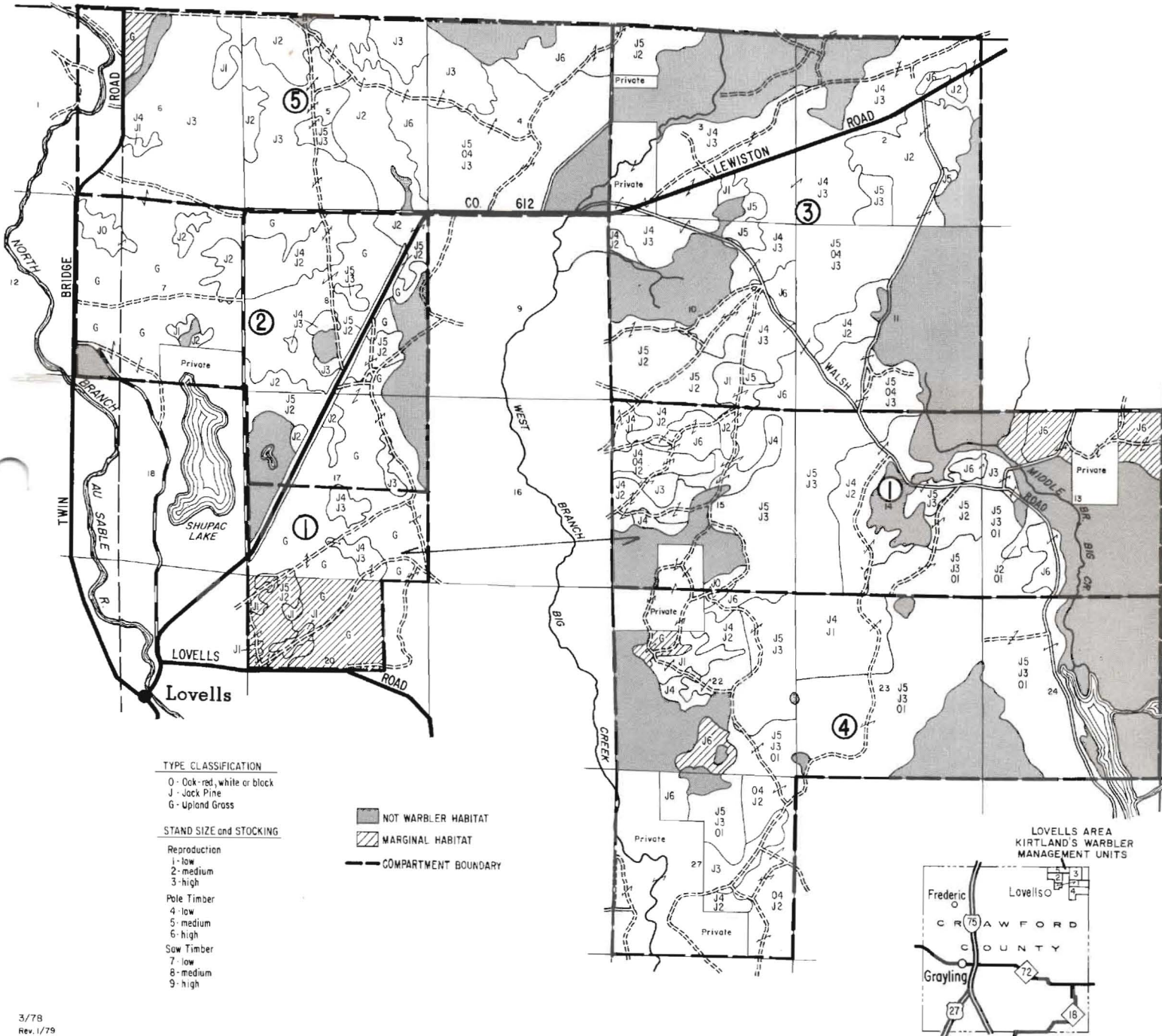
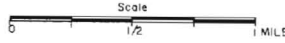
5	2026	14	J3	55	330
		15	J1	63	31
		16	G	38	<u>22</u>
TOTAL					383

Comments:

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

LOVELLS AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

CRAWFORD COUNTY, MICHIGAN
T 28 N, R 1 and 2 W



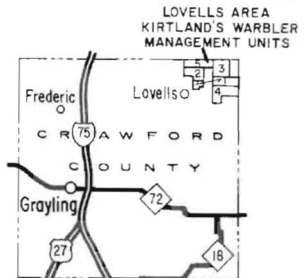
TYPE CLASSIFICATION

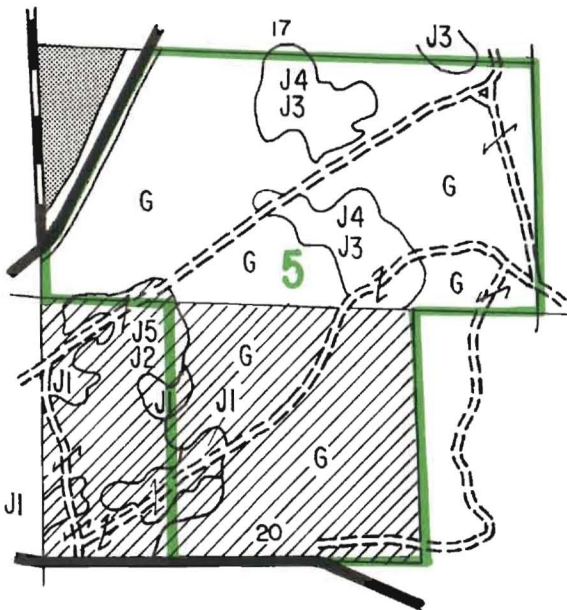
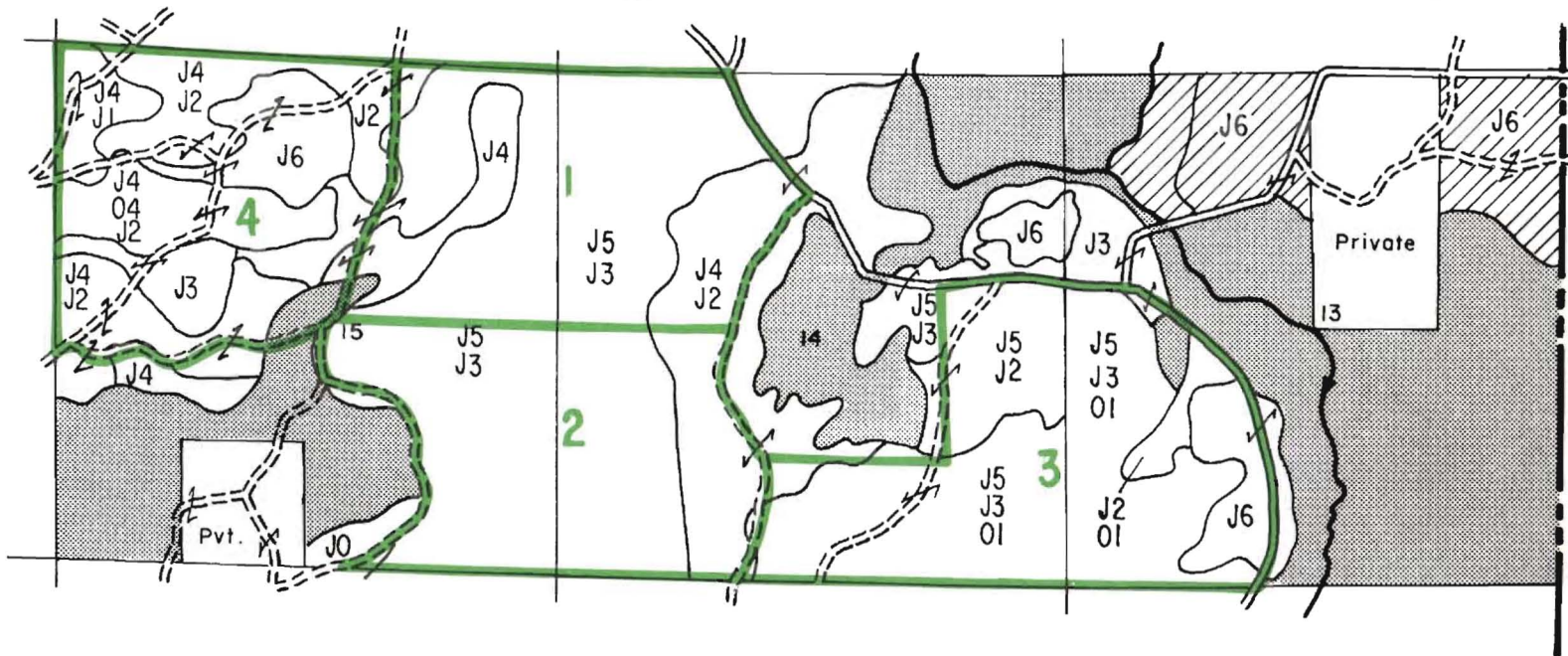
- O - Oak-red, white or black
- J - Jack Pine
- G - Upland Grass

STAND SIZE and STOCKING



- Reproduction**
- 1 - low
 - 2 - medium
 - 3 - high
- Pole Timber**
- 4 - low
 - 5 - medium
 - 6 - high
- Saw Timber**
- 7 - low
 - 8 - medium
 - 9 - high

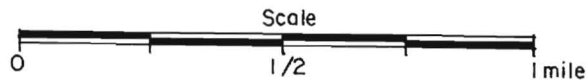
- NOT WARBLER HABITAT
- MARGINAL HABITAT
- COMPARTMENT BOUNDARY





LOVELLS AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 1)
T 28N, R 1W ; CRAWFORD CO. MICH.



-  Not habitat
-  Marginal habitat

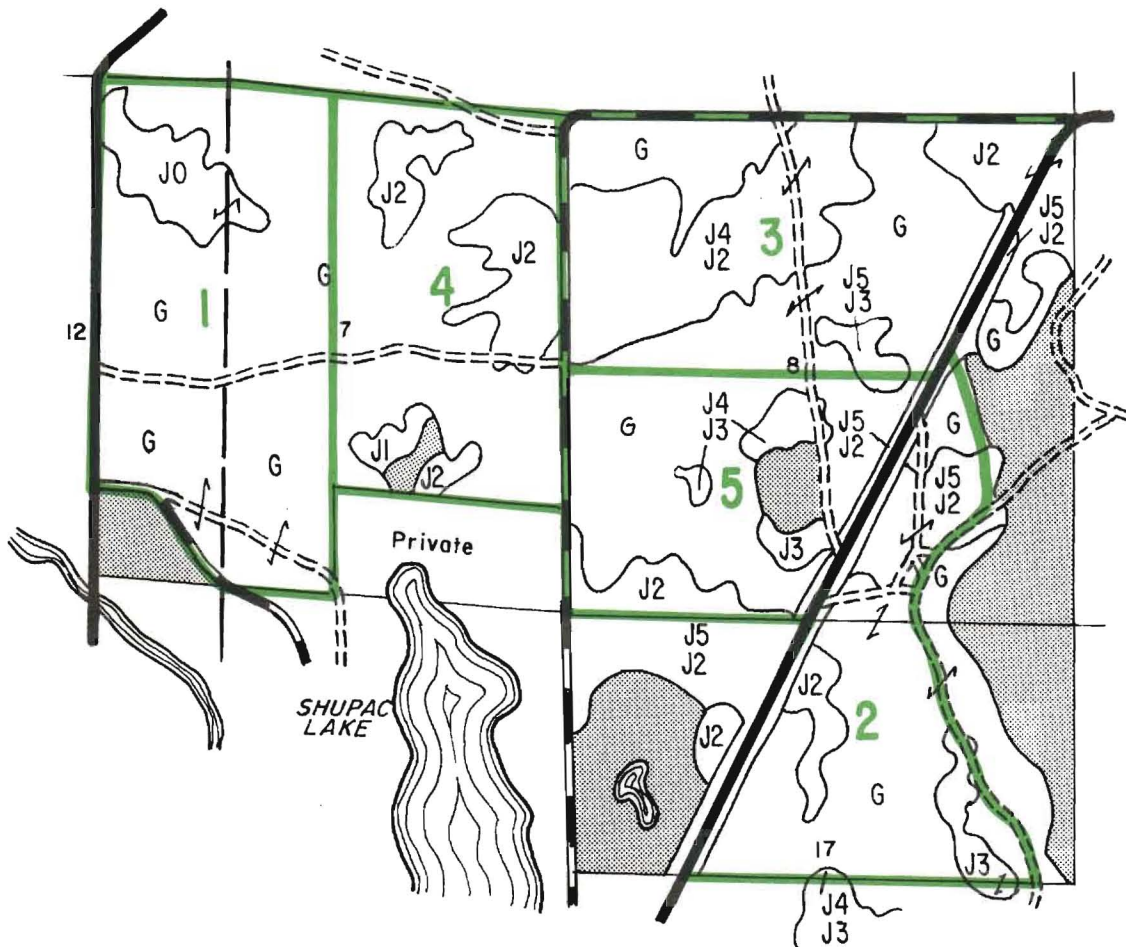
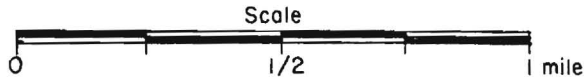


CUTTING BLOCKS - Compartment I

LOVELLS AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 2)

T 28 N, R 1 & 2 W; CRAWFORD CO. MICH.

-  Not habitat
-  Marginal habitat



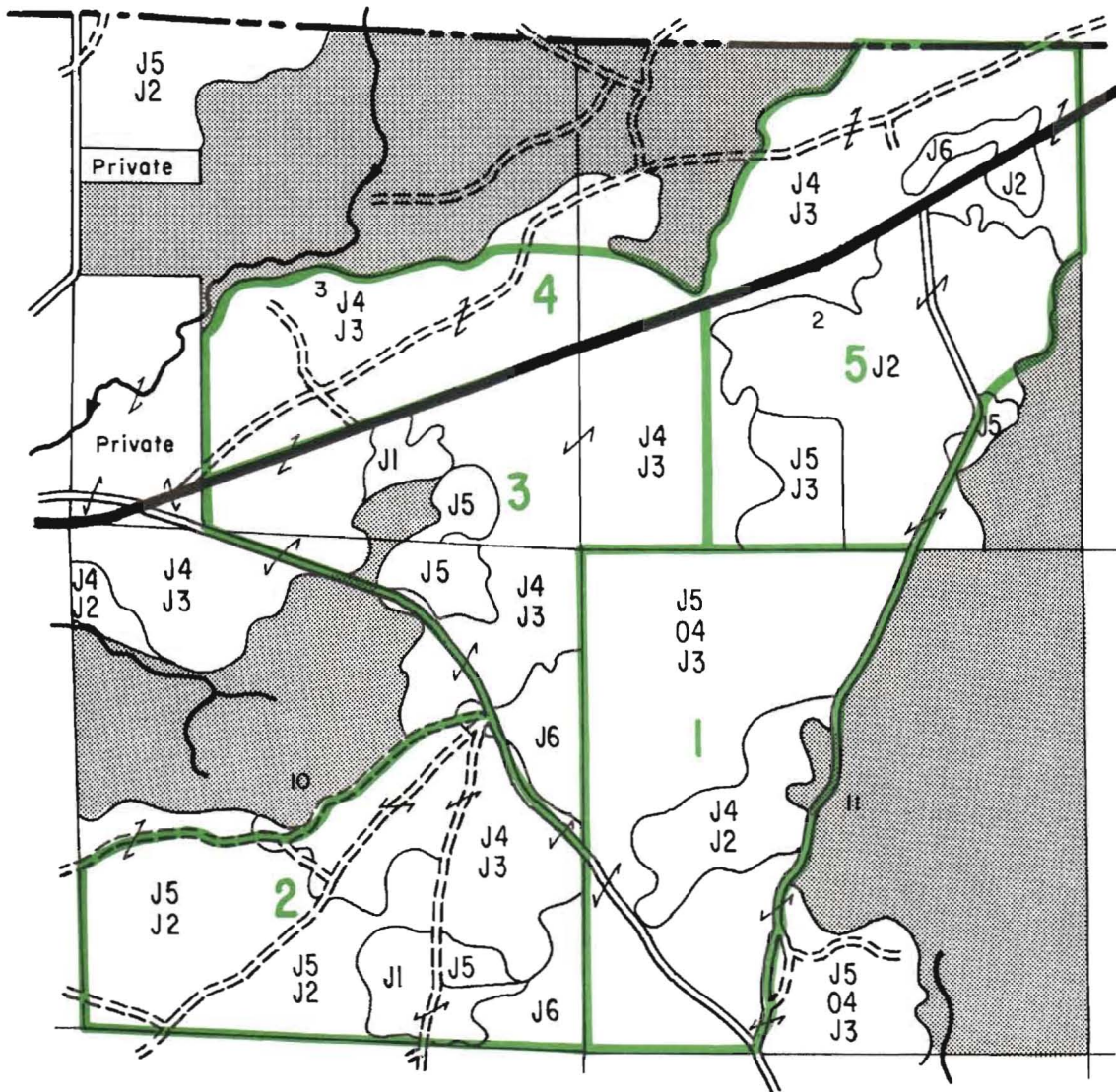
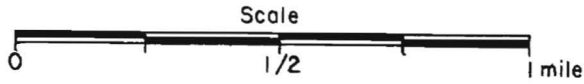
CUTTING BLOCKS -Compartment 3

LOVELLS AREA KIRTLAND'S WARBLER MANAGEMENT UNIT (COMPARTMENT NO.3)

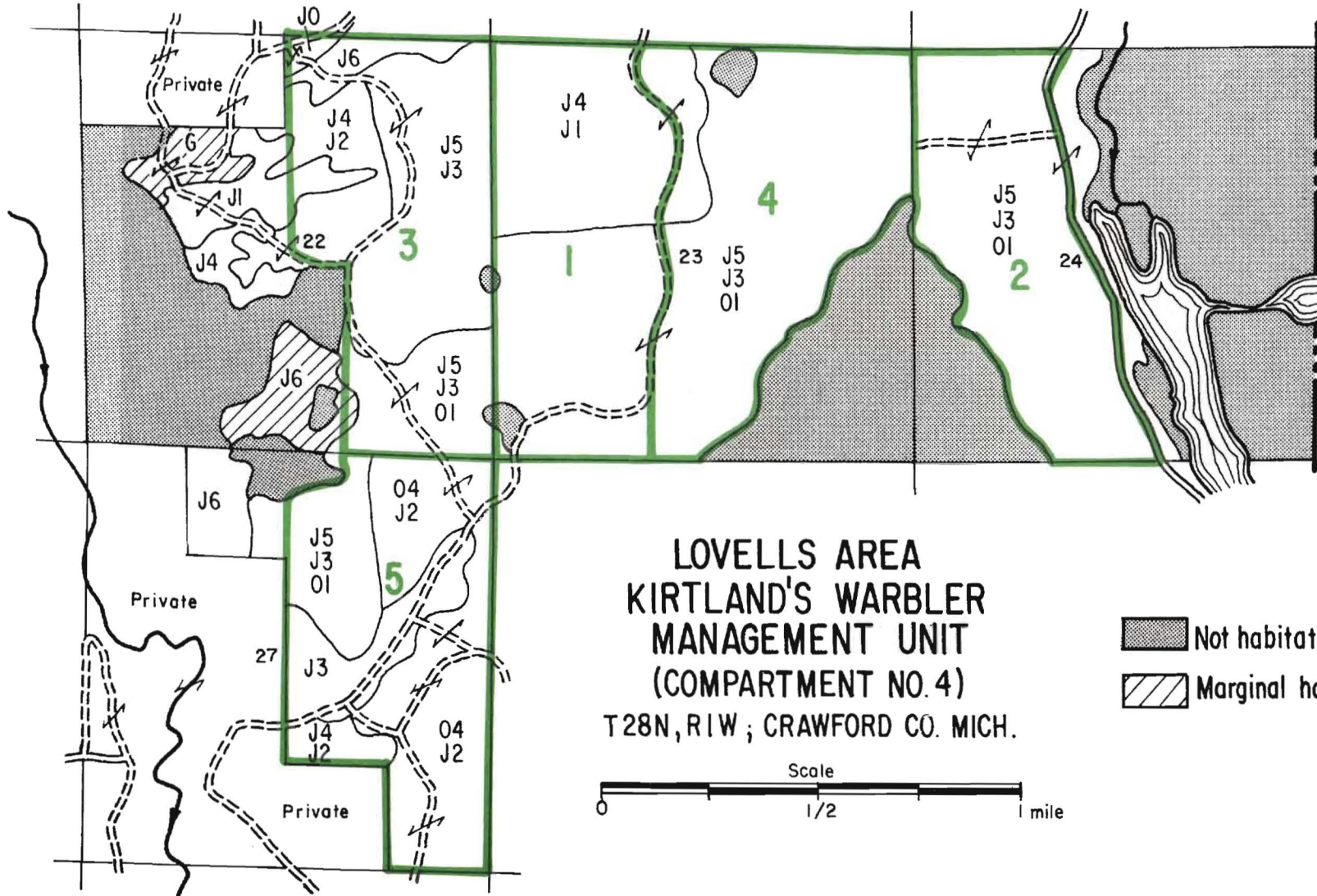
T28N, R1W ; CRAWFORD CO. MICH.

 Not habitat



 Marginal habitat

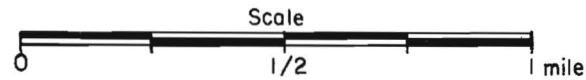


CUTTING BLOCKS-Compartment 4



**LOVELLS AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 4)
T28N, R1W ; CRAWFORD CO. MICH.**

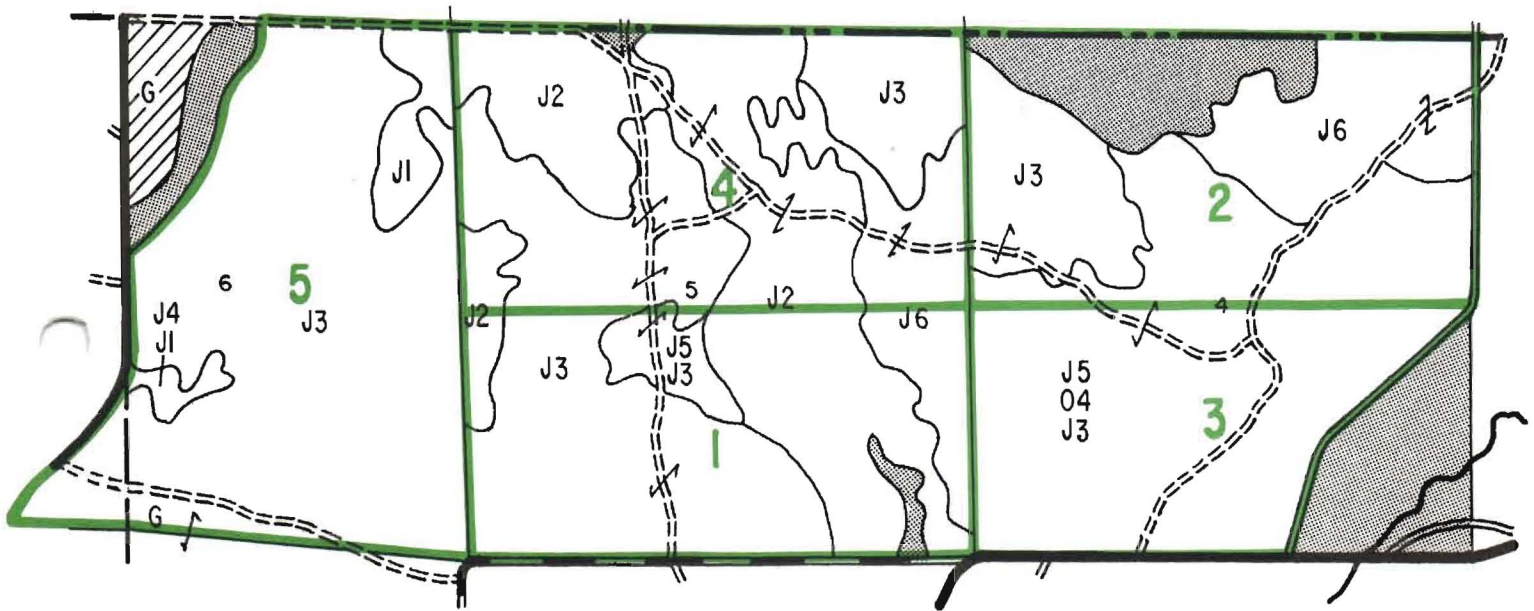
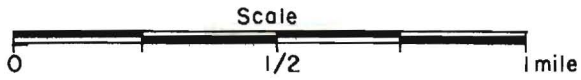
-  Not habitat
-  Marginal habitat



LOVELLS AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 5)

T28N, R1W ; CRAWFORD CO. MICH.

- Not habitat
- Marginal habitat



NORTH BRANCH KIRTLAND'S WARBLER MANAGEMENT AREA

Crawford County
T27N R1W

Inventory Compartments:

Au Sable State Forest, Roscommon Area	275 (Management Unit 1)
	284 (Management Unit 1)
	282 (Management Unit 2)

Area Description

- A. General location and background information: The North Branch Kirtland's Warbler Management Area is located in east central Crawford County. Most of Management Unit 1 occurs on the slightly moister (and hence slightly more fertile) Grayling coarse sand. Prescribed burning is mandatory in Unit 1 to inhibit undesirable ground cover and prevent eventual conversion to aspen. Management Unit 2 occurs on the dryer Grayling sand and thus is innately more suitable as warbler habitat. The North Branch Kirtland's Warbler Management Area straddles the North Branch of the Au Sable River. It is bounded by various timber types unsuitable for Kirtland's Warblers.
- The Cutting Blocks within each Management Unit are not contiguous due to the presence of drainages of the North Branch dividing the Units.
- B. Land ownership patterns: The presence of private ownerships within the Area is not a major inhibitor to management. However, Management Unit 2 has only four Cutting Blocks. The full complement of five Blocks could be realized if the northwest quarter of section 28 could be obtained by the State. For this reason and since this parcel is likely to have nesting warblers in the next eight to ten years, it is highly recommended that this 160 acres be acquired.
- C. Status of other resources: No immediate conflicts are seen with other resource use in the Area. However, several major county travel routes run through the Area. These are F-97, North Down River Road, and McMasters Bridge Road. Clear cuts should be designed with regard to the visual resource along these highways.
- D. Kirtland's warbler occupancy history: The Museum of Zoology, University of Michigan, has a specimen collected in 1903 from an unspecified location in T27N R1W. Three singing males were recorded for the first time in 1979 in Management Unit 1. These birds were found in natural jack pine reproduction resulting from a clearcut mature stand.

NORTH BRANCH AREA

Crawford County

Management Unit 1. Y.O.E. --- 8

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1978	1	<u>J4</u> J1	<u>34</u>	60
		2	J0		104
		3	<u>J4</u> J2	<u>10</u>	50
		4	J4	50 ← 60	41
		5	J2	32	10
		6	J5	50	9
		27	J4	55	<u>121</u>
TOTAL					395

Comments: Due to amount of ground vegetation, this Block must be burned with a hot fire following cutting. Summer burning is recommended.

*2	1988	7	<u>J5</u> J1	50 ← 60	74
		8	J1	12 ← 22	183
		9	J4 O4	46 ← 56	<u>82</u>
TOTAL					339

Comments: Most of the J1 stand is marginal habitat and has willow and cherry invading. To set this site back for Kirtland's Warblers, the entire Block should be burned with a hot fire following logging. Burning should be done as soon as possible to retard conversion. Cut, burn, and plant this Block beginning in 1978. The next entry time will then be back on schedule (50 years from 1988) in 2038.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	1998	10	J0		62
		11	$\frac{J4}{J2}$	$\frac{52}{34}$	118
		12	J3	44	6
		13	J5	61 ← 81	<u>26</u>
				TOTAL	212

Comments: To prevent unnecessary loss of pulpwood yield, cut the J5 stand as soon as possible. Note that this stand has already reached its pathological rotation. In 1998 the entire Cutting Block must be burned to maintain the area in warbler habitat.

*4	2008	14	$\frac{J4}{J2}$	$\frac{62}{44}$	159
		15	$\frac{J4}{J2}$	$\frac{40}{40}$	68
		16	J3	54	3
		17	J0		15
		19	$\frac{J4}{J2}$	$\frac{50}{50} \leftarrow 80$	<u>31</u>
				TOTAL	276

Comments: Cut the J4 stand now. In 2008 cut and burn the entire stand.

*5	2018	20	J2	50	156
		21	$\frac{J4}{J2}$	$\frac{80}{54}$	57
		22	$\frac{O7}{J2}$		<u>6</u>
				TOTAL	219

Comments: If economical, the J4 portion of the J4/J2 stand may be taken off prior to the scheduled cutting time of 2018. Burning with a hot fire following the cutting is necessary.

Management Unit 2. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1979	1	J1	no treatment	178
		2	$\frac{J4}{J3}$	$\frac{41 \rightarrow 61}{26 \rightarrow 46}$	30
TOTAL					208

Comments: No treatment is required in Cutting Block 1 in 1979 since most of the Block was burned by a wildfire in 1975. Regeneration is patchy. The J4/J3 stand (Stand 2) could be held for harvest at a later date. If held, it should not be cut until after Stand 1 is too old to attract warblers (in approximately 20 years).

2	1989	3	J6	53	29
		4	S6	?	5
		5	$\frac{J4}{J3}$	$\frac{52}{36}$	103
		6	J404	60	92
		7	$\frac{J4}{J1}$	$\frac{41}{}$	8
		8	$\frac{J4}{J3}$	$\frac{54}{34}$	28
		9	G		<u>13</u>
TOTAL					278

Comments: Part of the ground cover of the stands in this Block consists of sand cherry, juneberry and bracken fern. In order to keep these species from dominating, this Block should be burned with a hot fire during summer months.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
----------------------	----------------------	---------------------	---------------------	--	----------------

3	1999				
---	------	--	--	--	--

Comments: Since at present there is only enough state-owned land in Management Unit 2 to provide four Cutting Blocks, a Cutting Block 3 has not been designated. Therefore, no entry will be made in 1999. (See Comments under Cutting Block 5 for possible amendment.)

The 160 acres in the NW quarter of Section 28 is in private ownership. Most of this ownership has good to excellent warbler potential. If this 160 can be acquired, the full complement of five Cutting Blocks can be designated.

4	2009	10	J1	33	169
		11	O2		33
		12	$\frac{J4}{J3}$	$\frac{71}{56}$	<u>50</u>
				TOTAL	252

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
5	2019	13	J4 J3	81 66	112
		14	J1	43	3
		15	G		9
		16	R3	61	93
TOTAL					217

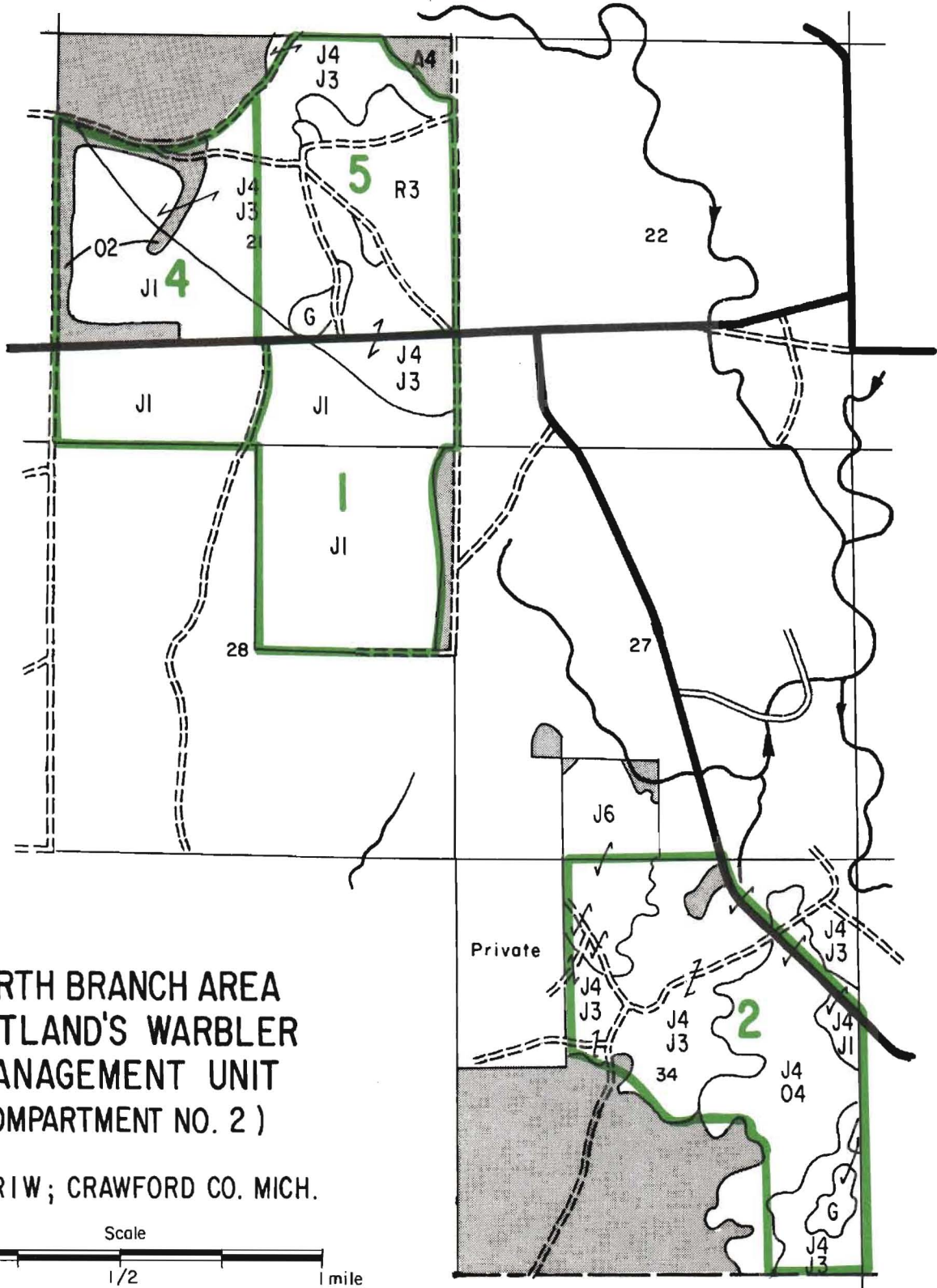
Comments: This Block was designated the fifth Cutting Block in order to hold the R3 stand (Stand 16) for the longest possible time. This involves holding Stand 13 (J4/J3) beyond maturity.

By 1999, the growth rate of the R3 stand will be known. If, at that time, it is determined that Stand 16 is not achieving at least good growth, it is suggested that the entire Cutting Block 5 be cut, burned and regenerated to jack pine. Block 5 will, therefore, become Block 3, meaning a cutting in 1999 and none in 2019. Block 5 will be the missing Block in this Management Unit.

If the NW quarter of Section 28 has been acquired, then that acquisition could become part of Cutting Block 5.

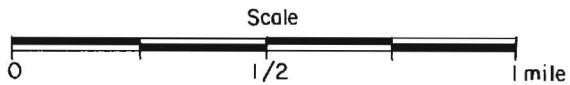
¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.



CUTTING BLOCKS-Compartment 2



**NORTH BRANCH AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 2)**

T27N, RIW; CRAWFORD CO. MICH.



-  Not habitat
-  Marginal habitat

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

Mio, Michigan 48647
September 29, 1987

TO: Tom Weise, Endangered Species Coordinator
Wildlife Division

FROM: Sylvia Taylor, District Wildlife Biologist

SUBJECT: Pere Cheney K.W. Unit

Attached are maps of the newly acquired U.S.F.S. land at Pere Cheney, and a related memo from Forest Management Division. It contains about 1,000 acres of essential Kirtland's Warbler habitat.

I suggest the following:

1. Notify the U.S.F.W.S. of the change in ownership. This could be accomplished by including information in this year's federal aid report and informal contact with Jim Engle. Mike DeCapita was by our office September 23. I gave him a copy of these maps, so the E. Lansing U.S.F.W.S. staff is aware of the changes.
2. Obtain the treatment schedule and projected costs for the unit from the U.S.F.S. so that the increased costs may be addressed in our budget requests.
3. Consider combining these lands with our existing Pere Cheney Kirtland's Warbler Management Unit.

ST:rm

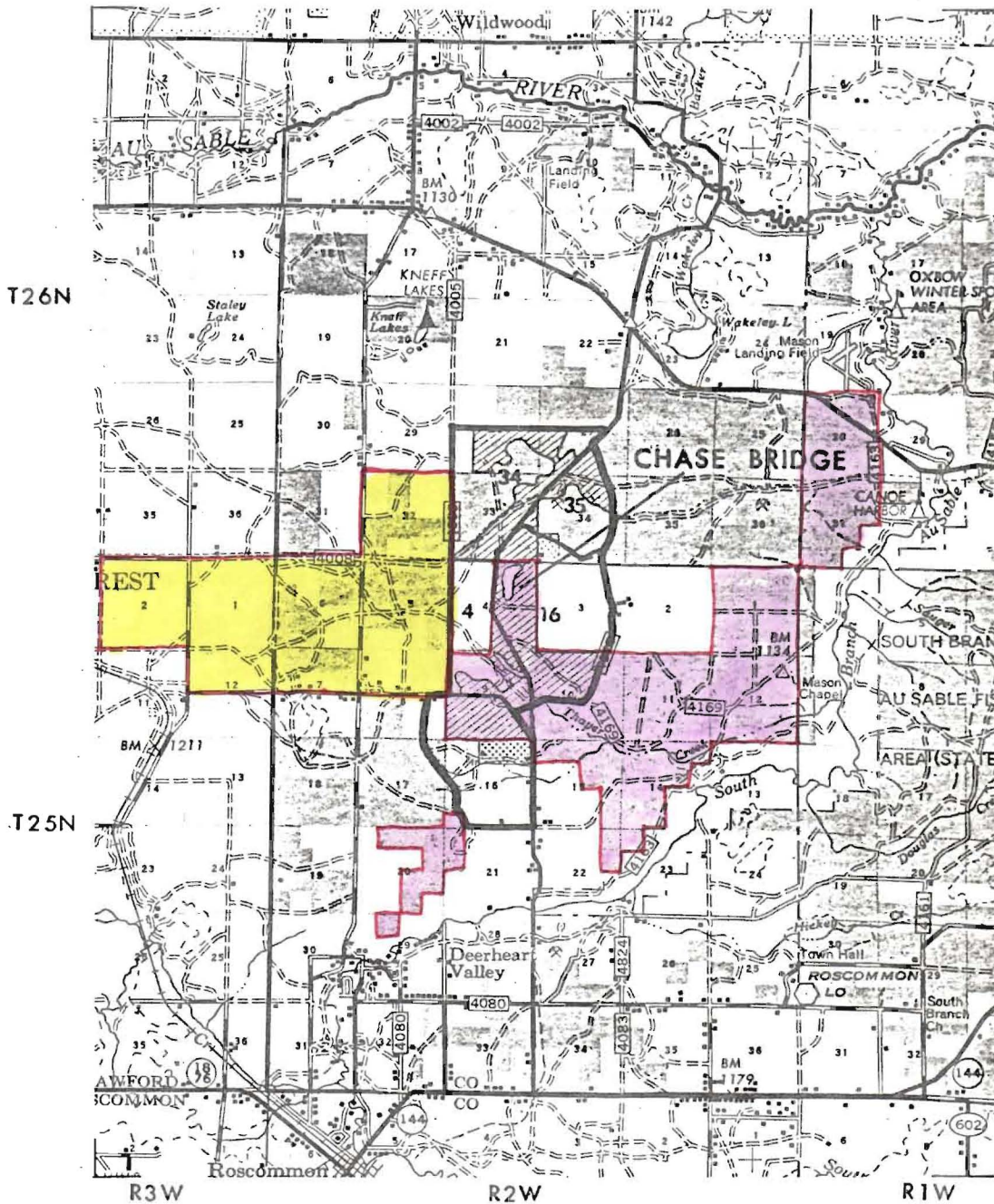


RECEIVED

OCT. 1 1987

NATURAL RESOURCES
WILDLIFE DIVISION

HURON-MANISTEE NATIONAL FOREST
KIRTLAND'S WARBLER MANAGEMENT AREA
PERE CHENEY
CRAWFORD COUNTY, MICH.
 1978



LEGEND

- UNIT BOUNDARY
- COMPARTMENT BOUNDARY
- - - RANGER DISTRICT BOUNDARY
- ▨ CRITICAL HABITAT IN NATIONAL FOREST OWNERSHIP
- ▤ POTENTIAL HABITAT IN PRIVATE OWNERSHIP

SCALE 1/2" = 1 MILE

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

Mio, Michigan 48647
September 23, 1987

TO: Bill Mittig, District Forest Manager
Bill Tarr, Timber Management Specialist
Robert Borak, Regional Forest Manager
Paul Flink, State Forest Operations Section
Sylvia Taylor, District Wildlife Biologist
Gary Boushelle, Regional Wildlife Biologist
Grayling Field Office

FROM: Jim McMillan, Area Manager

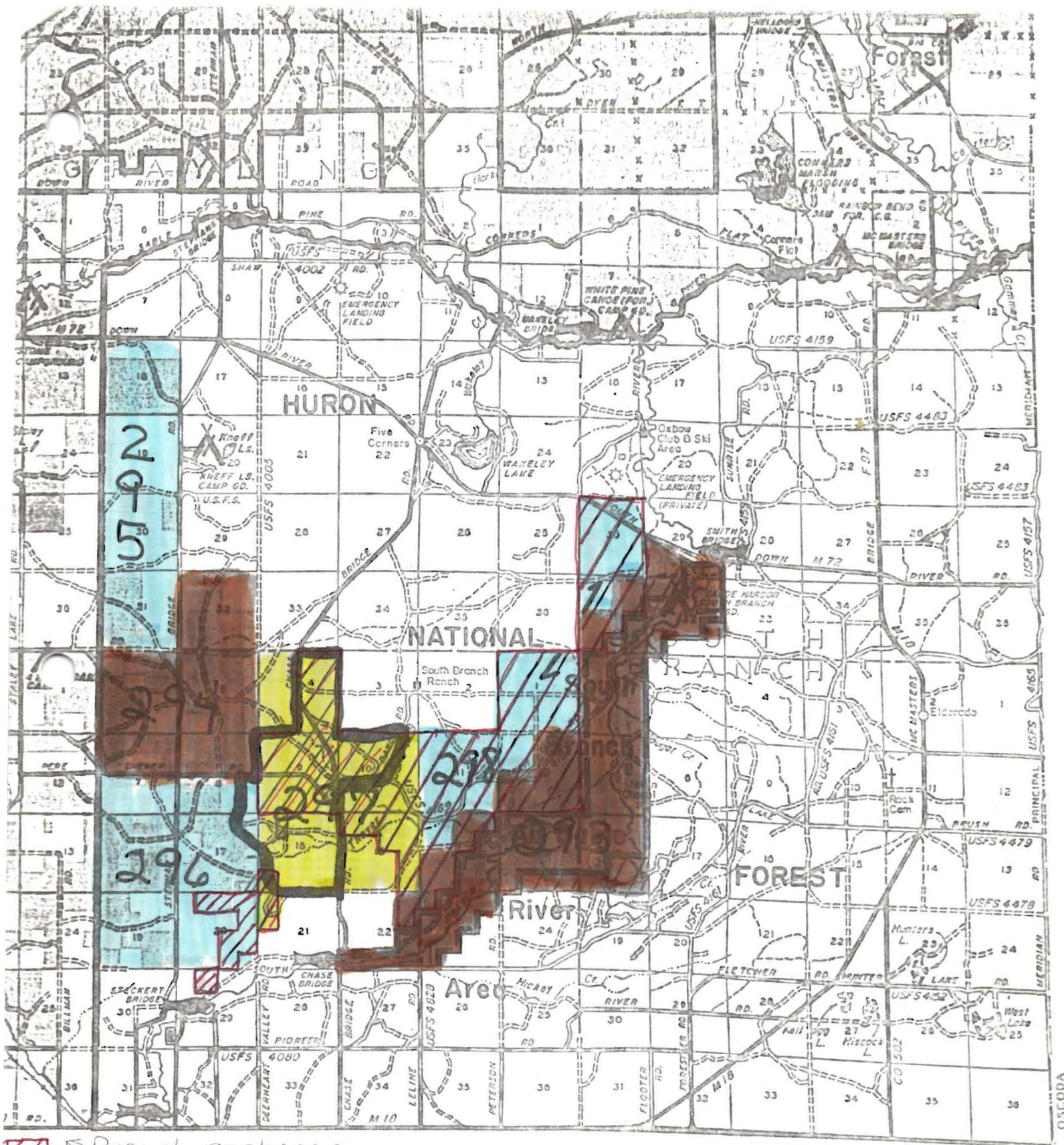
SUBJECT: Compartment Assignments - Newly Acquired Land

Through exchanges with the U.S. Forest Service from 1983 to 1986, the State received additional land in Crawford County. We have now put this land into compartments (see enclosed map) and have assigned them the following Years of Entry:

<u>Compartment</u>	<u>Next Y.O.E.</u>
293 (Mason Tract)	1994
294 (K.W. existing comp.)	1996
295	1993
296	1994
297	1991
298	1995

JM:rm







T. 26

T.

OSCODA COUNTY

 Recent exchange
 Existing compartments
 R.2W.
 LEGEND (293 expended)



R.1W.

-  BOUNDARIES, STATE AND NATIONAL PROJECTS
-  D. N. R. FIELD OFFICE
-  COUNTY, TOWNSHIP, MUNICIPAL PARKS AND PICNIC AREAS
-  PUBLIC ACCESS SITES
-  WILDLIFE FLOODING AREAS

9/87

PERE CHENEY KIRTLAND'S WARBLER MANAGEMENT AREA

Crawford County
T26N R2W, T25N R2W and T25N R3W

Inventory Compartments:

Au Sable State Forest, Roscommon Area	232 (Management Unit 1)
	294 (Management Unit 2)

Area Description

- A. General location and background information: The Pere Cheney Kirtland's Warbler Management Area is located eight miles southeast of Grayling. The Area lies on a Grayling sand flat that begins south of Kneff Lake and runs for three miles to the south, until it gives way to more broken topography and better soils. This sand plain runs in a northwesterly-southeasterly direction for approximately seven miles.

Much of Management Unit 2 was burned in the late 1950's by the Pere Cheney fire. Sites are generally poor with a slight improvement in fertility in Management Unit 1. A number of red pine plantations have been put in with poor results in the western part of the Area and fair results in the eastern part.

At the time of publication of this plan, Management Unit 2 belongs to the National Forest System. Since a land exchange is imminent, with this Unit to be transferred to the State of Michigan, it is presented here as part of the state's Kirtland's Warbler Habitat Management Plan.

- B. Land ownership patterns: There is a substantial amount of private land intermixed with public land in this area. Warbler management will be somewhat restricted by this ownership pattern. There are few permanent residences, but numerous seasonal residences are situated on the private tracts along Chase Bridge, Staley Lake and Pere Cheney roads. A total of approximately 620 acres has been identified for potential land acquisition in the Pere Cheney Area.
- C. Status of other resources: Human use in the Area is relatively light. Pere Cheney Road, Staley Lake Road and Four mile Road are the main routes through the Area. They are improved gravel and asphalt roads and receive light to moderate use.

Recreational use in the area is typical of the dispersed use in other areas. Blueberry picking and ORV use of the trails in the Area are probably the major uses. Neither of these activities is done to a great extent. The Shore-to-Shore Riding and Hiking Trail runs through the Area. A trail camp is located in Section 1, T25N R3W. The route and camp may require relocation in the future if adjacent habitat becomes occupied by nesting warblers. In addition, the warbler occupied habitat in Management Unit 2 has been occasionally used by the U.S. Fish and Wildlife Service for visitor tours from Grayling.

- D. Kirtland's warbler occupancy history: Warblers have occupied the Pere Cheney burn in section 6 and 7 T25N R2W. This habitat is rapidly growing out of the suitable size for Kirtland's Warbler nesting. As of 1978, a relict population of three singing males still exists in sections 6 and 7. In addition, two males were found in T25N R3W, Section 12, during the 1978 census.

PERE CHENEY AREA

Crawford County

Management Unit 1. Y.O.E. --- 7

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1977	6	J4 J2	60 30	5
		7	J4 O4	60	13
		1	J5 O1	60	37
		2	J6	62	15
		3	J4 J1	50 16	22
5		4	J2	30	45
		5	J5 J1	53 12	83
TOTAL					220

Comments: Either isolate a 20-acre piece in the NE 1/4 of NW 1/4 of Section 1 for the Trail Camp or move Trail Camp to another location, for example to the N 1/2 of the NE 1/4 of Section 2.

This Block should be burned following cutting.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
2	1987	12	J6 O1	<u>41</u>	59
		11	Closed dump	0	6
		8	J4 J2	<u>50</u> 38	169
		9	J5	44	5
		10	J3	26	6
			Misc.		
TOTAL					250

Comments:

*3	1997	14	J4 J2	60 ← <u>80</u> 50	233
		15	J4 J3	<u>53</u>	24
		16	J5 J1	<u>73</u> 32	<u>23</u>
TOTAL					280

Comments: The J4/J2 stand may have the J4 cut in 1977 if economically feasible. There is a small patch of 54 year jack pine in the J4/J3 stand. This may be cut now also. The block should be burned following cutting.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2007	17	$\frac{J5}{J1}$	53 ← $\frac{83}{42}$	17
		18	J3	59	18
		24	J2	60	5
		19	$\frac{J4}{J2}$	50 ← $\frac{80}{44}$	44
		20	J3	44	72
		28	$\frac{J5}{J1}$	$\frac{61}{44}$	20
		21	$\frac{J4}{J1}$	$\frac{55}{44}$	22
		22	$\frac{J4}{J3}$	47 ← $\frac{77}{50}$	14
		23	J3	50	<u>28</u>

Comments: The J4/J2 stand in the NW 1/4 of NW 1/4 of Section 12 (Stand 5), the J5/J1 stand in the S 1/2 of SE 1/4 of SW 1/4 of Section 1, and the J4/J3 stand in the SE 1/4 of the NE 1/4 of Section 12 should have the overstory J4, J5 and J4, respectively, removed in 1977. This may permit the understory to support warblers, having a current age of 14.

*5	2017	25	J3	56	194
		26	J5	76	15
		27	$\frac{J4}{J2}$	← $\frac{80}{68}$	20
		Misc.			<u>11</u>
				TOTAL	240

Comments: It may be desirable to harvest the J5 and J4/J2 stands prior to the 2017 year of entry. The entire block, however, should be burned in 2017.

Management Unit 2. Y.O.E. --- 6

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1986	1	J6	64	3
		2	J4	53	62
		3	J5	56	7
		5	J3	38	29
		6	J5	58	6
		7	J6	60	105
		8	J5	59	6
		9	J5	67	22
		10	J3	46	8
		11	J5	53	6
		12	J2	37	13
		13	J3	32	<u>12</u>
				TOTAL	279

Comments:

*2	1996	14	J5	60	166
		15	J4	46	26
		16	J1	27	10
		17	J5	72	<u>25</u>
				TOTAL	227

Comments: Stand 17 may need to be cut prior to 1996 to prevent timber loss.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2006	18	$\frac{J5}{J2}$	$\leftarrow \underline{75}$	146
		19	$\frac{J4}{R2}$	$\underline{38}$	<u>29</u>
		TOTAL			

Comments: The J5 overstory should be removed from Stand 18 prior to 2006.

*4	2016	20	J5	71 \leftarrow 81	38
		21	J3	60 \leftarrow 70	34
		22	G		7
		23	R2	52	11
		24	J5	66 \leftarrow 76	<u>116</u>
TOTAL				206	

Comments: Cutting Block 4 should be cut with Cutting Block 3 in 2006. Burning and regeneration of Block 4, however, should be held off until 2016 so as to not permit a void in habitat.

The R2 stand may be held from cutting for another rotation if the growth rate warrants it.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2026	25	J5 J2	<u>62</u> ← <u>108</u> 30 ← 76	59
		26	J5	62 ← 108	62
		27	J3	66	141
		28	J5	62 ← 108	<u>19</u>
				TOTAL	281

Comments: Stands 25, 26 and 28 are high risk. These stands should be cut as soon as possible. They should then be burned and regenerated to jack pine. These stands will then be old enough to harvest and regenerate again in 2026 with the remainder of the Cutting Block.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

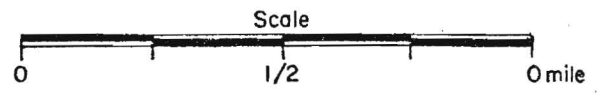
*First Suggestion For
USFWS Demonstration Area
10-10-79*

CUTTING BLOCKS - Compartment 2

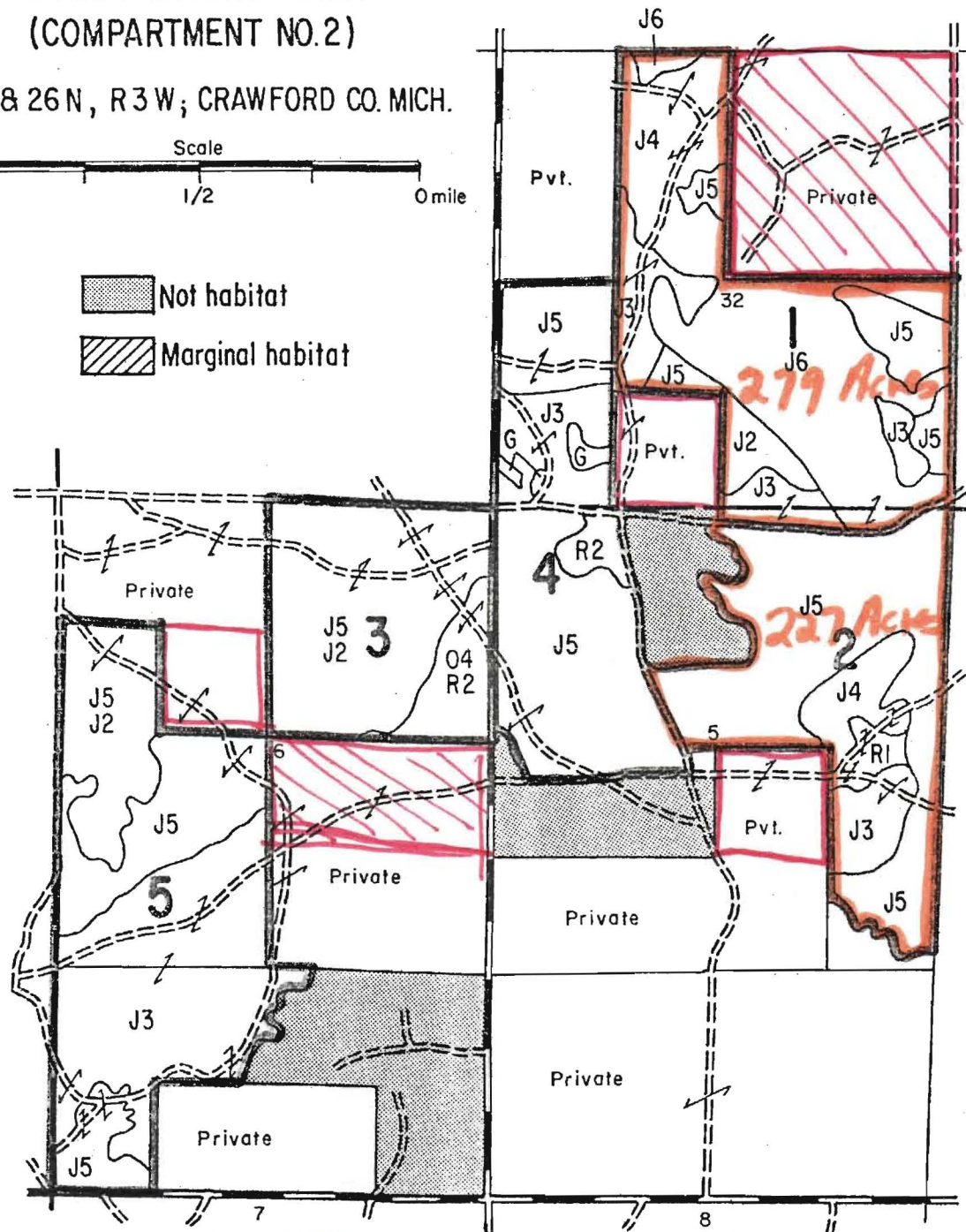
PERE CHENEY AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 2)

*Set aside Blocks 1 + 2 for
Demonstration area*

T 25 & 26 N, R 3 W; CRAWFORD CO. MICH.



Not habitat
Marginal habitat



279 Acres
227 Acres

*Total
Blocks
1 + 2 =
506 acres*

Priority List - No response from owner
 Priority List - Positive response from owner

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

*J. Weirich
& Taylor
Quinn*

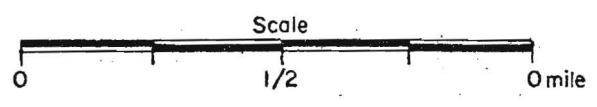
*First Suggestion For
USFWS Demonstration Area
10-10-79*

CUTTING BLOCKS-Compartment 2

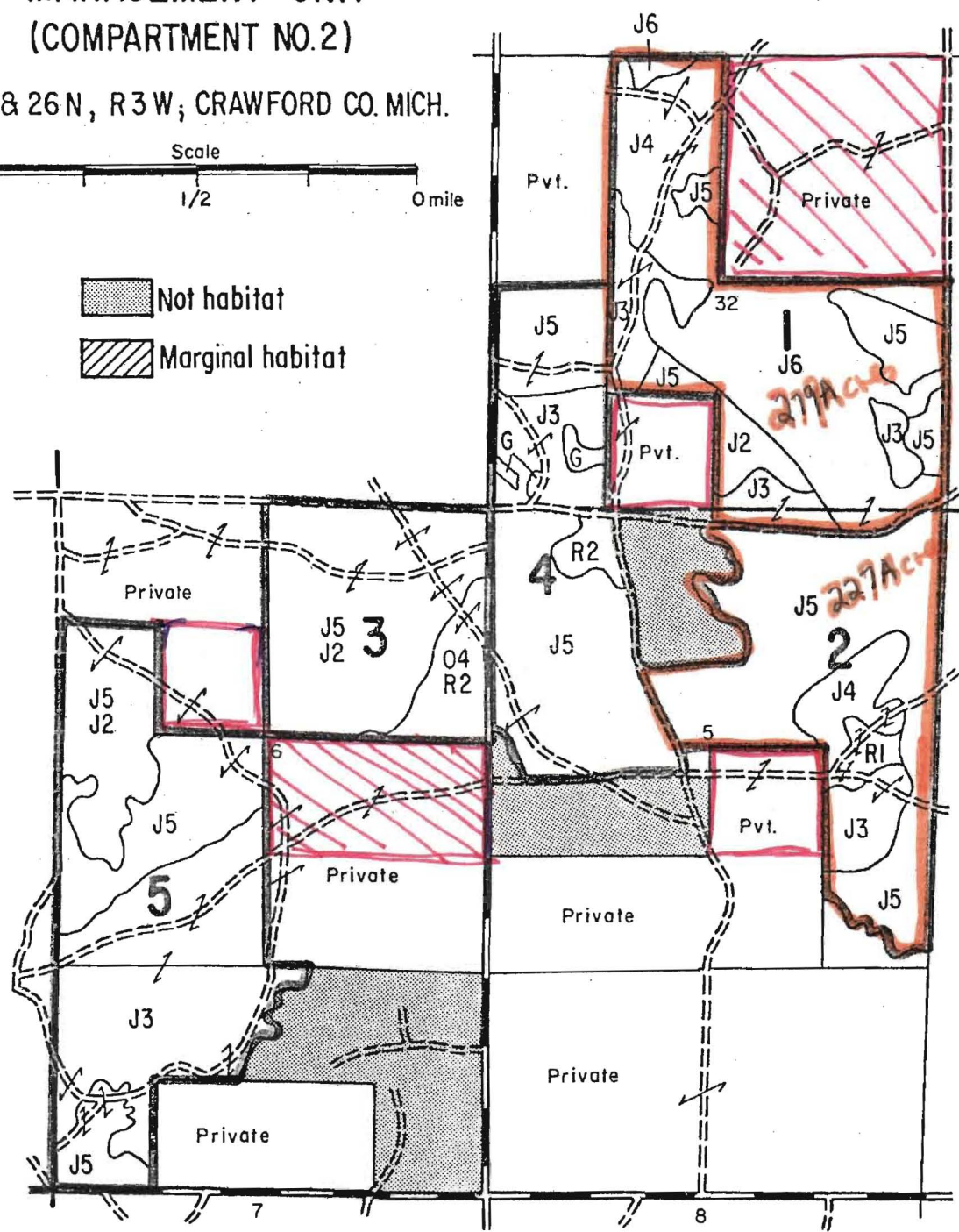
PERE CHENEY AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO.2)

*Set aside Blocks 1 & 2
for demonstration area*

T 25 & 26 N, R 3 W; CRAWFORD CO. MICH.



Not habitat
Marginal habitat



*Total
Blocks
1 & 2
506
Acres*

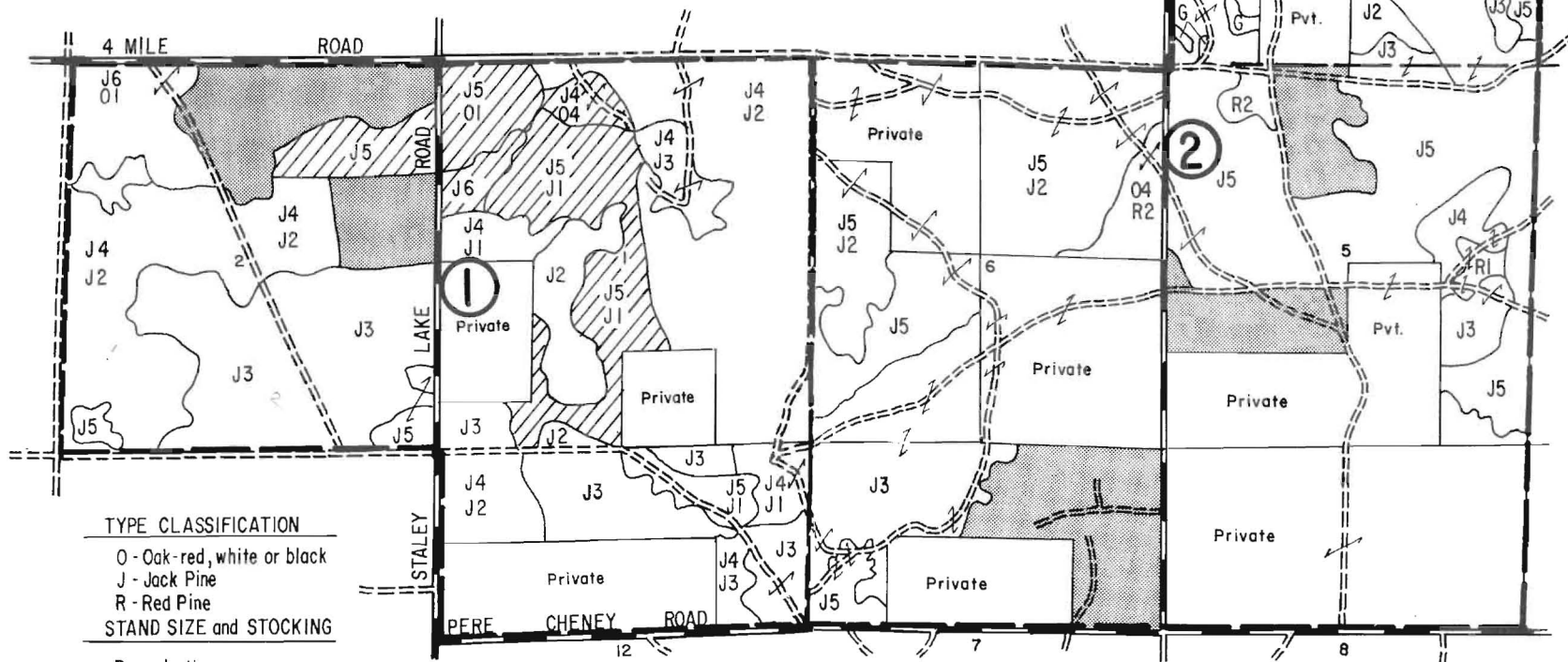
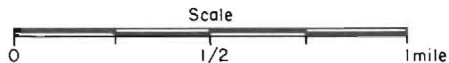
Priority List - No response
 Priority list - Positive Response

MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

*J. Weirich
S. Taylor
J. DeLuca*

PERE CHENEY AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

CRAWFORD COUNTY, MICHIGAN
T 25 & 26 N, R 2 & 3 W



TYPE CLASSIFICATION

- O - Oak-red, white or black
- J - Jack Pine
- R - Red Pine

STAND SIZE and STOCKING

Reproduction

- 1 - low
- 2 - medium
- 3 - high

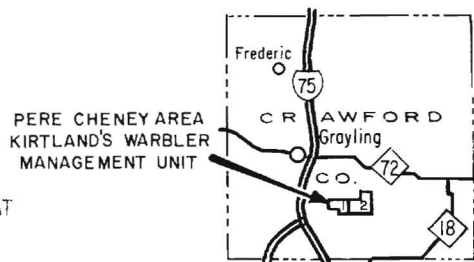
Pole Timber

- 4 - low
- 5 - medium
- 6 - high

NOT WARBLER HABITAT

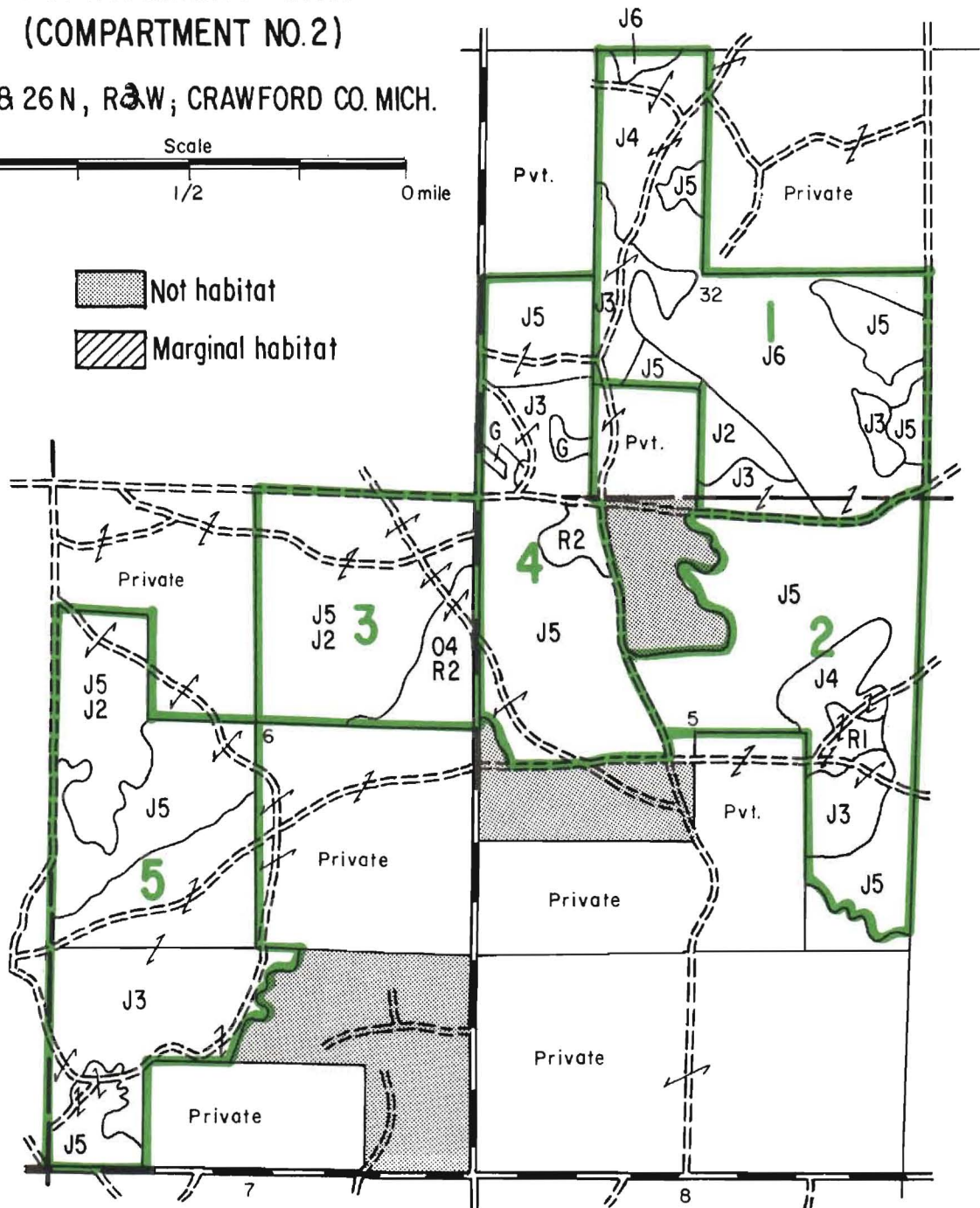
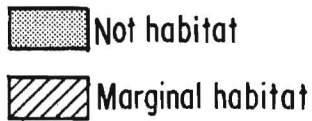
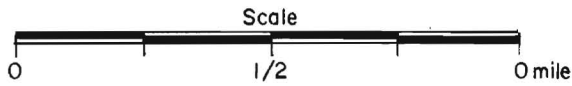
MARGINAL HABITAT

COMPARTMENT BOUNDARY



PERE CHENEY AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO.2)

T 25 & 26 N, R 2 W; CRAWFORD CO. MICH.



STALEY LAKE KIRTLAND'S WARBLER MANAGEMENT AREA

Crawford County
T26N R3W

Inventory Compartments:

Au Sable State Forest, Roscommon Area	235 (Management Unit 1)
	234 (Management Unit 2)

Area Description

- A. General location and background information: The Staley Lake Kirtland's Warbler Management Area is three miles east of Grayling with the bulk of the Area occurring south of State Highway M-72. Two Cutting Blocks are situated north of the Au Sable River. Within a mile and a half of the Au Sable the topography is flat. Further to the south it becomes rolling. The hills often support northern pin oak as the predominant species. Therefore, potential warbler habitat is scattered, as is exhibited by the non-contiguous cutting blocks in Management Unit 2.
- B. Land ownership patterns: A considerable number of small private parcels, many of which have seasonal or private residences, are found adjacent to and within the Staley Lake Kirtland's Warbler Management Area. Extra care in prescribed burning must therefore be exercised.
- A few private parcels may be acquired to further management in the Area.
- C. Status of other resources: Visual impact of the proposed clearcuts should be addressed where M-72 runs through the Area.
- D. Kirtland's warbler occupancy history: Currently there are five singing males on the north end of this Area. Up until the last several years there had been no records of warblers nesting in this Area, although warblers have nested in surrounding jack pine plains. Most of the Area is too old to hold warblers at this time.

STALEY LAKE AREA

Crawford County

Management Unit 1. Y.O.E. --- 0

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1980	10	$\frac{J4}{J2}$	$\frac{47}{27}$	33
		11	$\frac{J404}{J2}$	$\frac{60}{27}$	13
		12	$\frac{O4}{J2}$	$\frac{27}{27}$	69
		13	$\frac{J5}{J2}$	$\frac{57}{27}$	43
		14	G		17
		15	Sand		<u>9</u>
				TOTAL	184

Comments:

2	1990	2	$\frac{J404}{J2}$	$\frac{57}{32}$	<u>243</u>
				TOTAL	243

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>		
*3	2000	3	J2	58	80		
		4	J2	35	21		
		5	R3	36	10		
		6	$\frac{J5}{J2}$	57 ← $\frac{77}{47}$	101		
		7	$\frac{O4}{J2}$	44	4		
		8	J4J3	52	7		
		9	$\frac{J4O4}{J2}$	57 ← $\frac{67}{42}$	9		
		TOTAL					232

Comments: Stand 6 has about 45 square feet of basal area of jack pine overstory. To prevent loss due to overmaturity, it is suggested that the J5 compartment be removed in 1980.

Stand 9 may be cut with Stand 2 of Cutting Block 2 in 1990. This is to prevent possible loss of the overstory jack pine.

The entire Block will be regenerated in 2000.

*4	2010	1	$\frac{J4}{J2}$	← 82	<u>260</u>
			TOTAL		

Comments: The overstory may be removed prior to 2010.

*5	2020	16	$\frac{J4}{J2}$	$\frac{69}{52}$	226
		17	J2	53	<u>91</u>
TOTAL					317

Comments: In stand 16, the J4 may be removed prior to 2020.

Management Unit 2. Y.O.E. --- 2

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1982	1	J6	58	160
		2	J604	53	107
		3	<u>J404</u> J1	<u>48</u>	<u>53</u>
TOTAL					320

Comments:

2	1992	4	J504	64	261
		5	J504	71	<u>39</u>
TOTAL					300

Comments:

*3	2002	7	<u>J4</u> J3	<u>63</u> 46	50
		8	<u>J4</u> J2	← <u>77</u> 44	164
		9	J3	48	<u>16</u>
TOTAL					230

Comments: It may be desirable to remove the J4 overstory from Stand 8 prior to 2002.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2012	10	<u>J5O4</u> J2	59 ← <u>89</u> 54	45
		11	<u>J4O4</u> J2	54 ← <u>84</u> 54	76
		12	<u>J4O4</u> J2	42 ← <u>72</u> 54	106
		13	<u>J5</u> O1	53 ← <u>83</u>	10
		14	J6	58 ← 88	20
		15	<u>J4R4</u> J2	53 ← <u>83</u> 59	28
		16	J5O4	54 ← 84	<u>24</u>
				TOTAL	309

Comments: Most of the stands in this Cutting Block have mature overstories. These may be cut as soon as possible. The entire Block, however, must be cut and regenerated to jack pine in 2012.

5	2022	17	J2	66	144
		18	J2	60	16
		19	<u>J4</u> J1	<u>66</u>	62
		20	J1	56	28
		21	G		<u>13</u>
				TOTAL	263

Comments:

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

STALEY LAKE AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

CRAWFORD COUNTY, MICHIGAN

T26N, R3W



TYPE CLASSIFICATION

- O - Oak-red, white or black
- J - Jack Pine
- R - Red Pine
- G - Upland Grass

STAND SIZE and STOCKING

Reproduction

- 1 - low
- 2 - medium
- 3 - high

Pole Timber

- 4 - low
- 5 - medium
- 6 - high

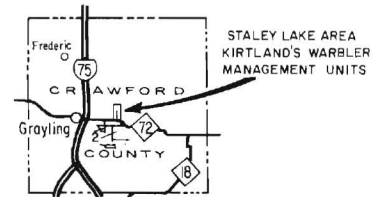
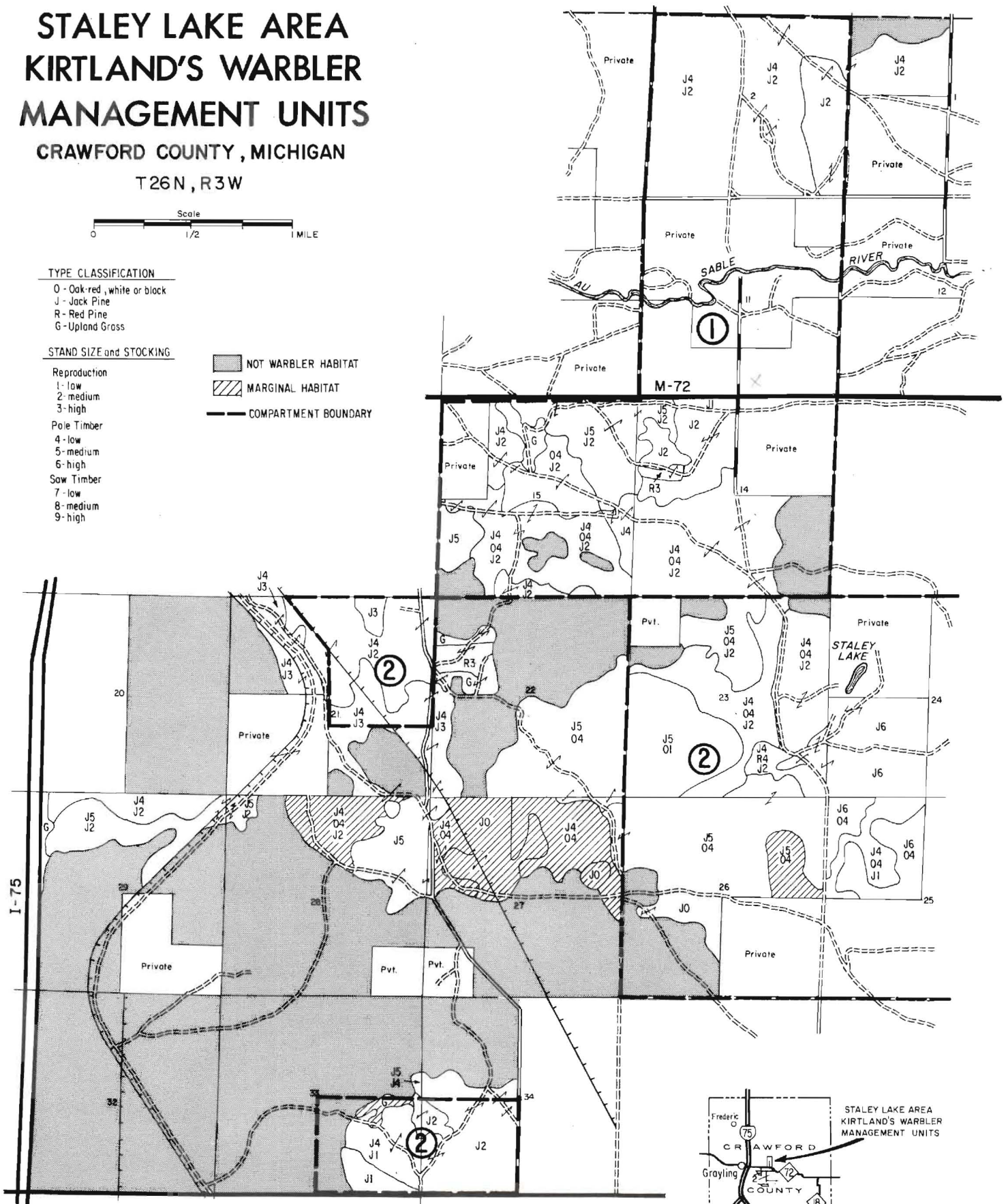
Saw Timber

- 7 - low
- 8 - medium
- 9 - high

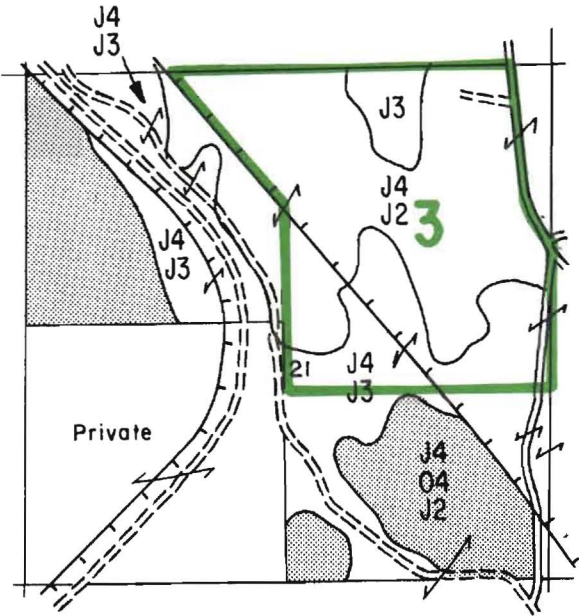
NOT WARBLER HABITAT

MARGINAL HABITAT

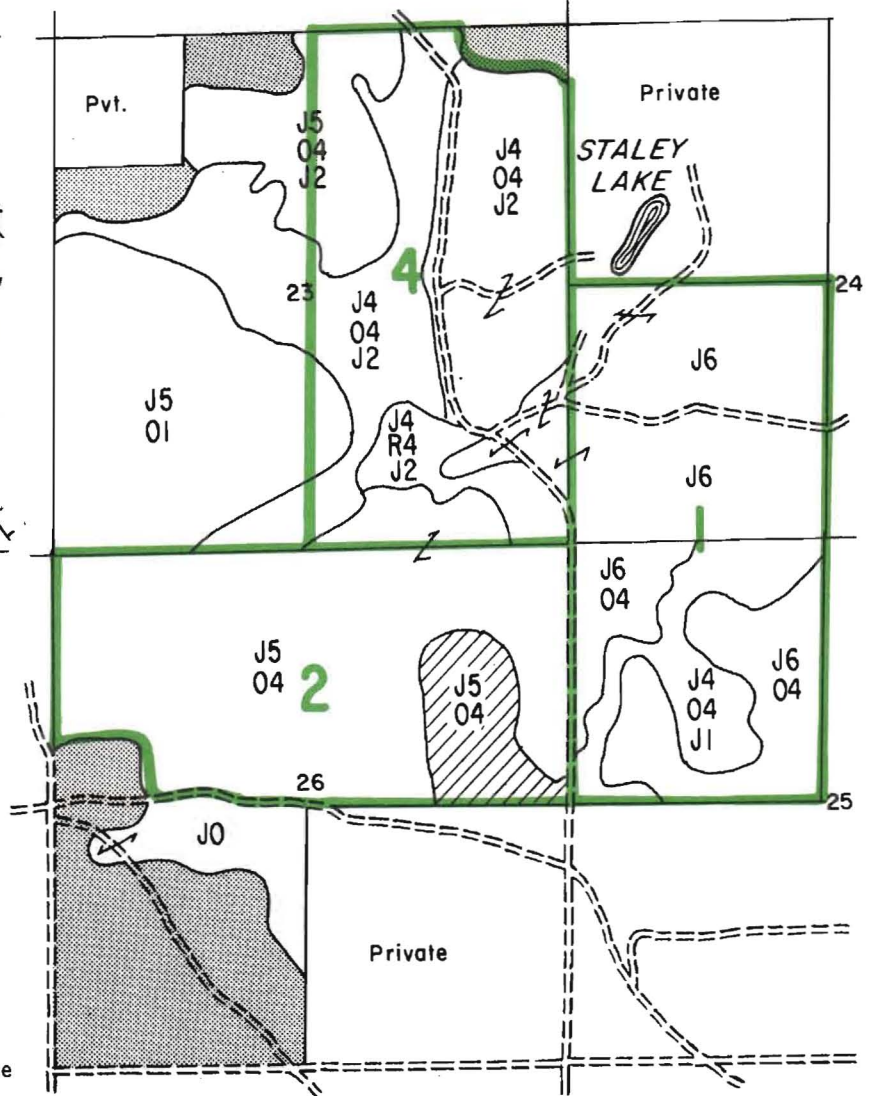
COMPARTMENT BOUNDARY



CUTTING BLOCKS-Compartment No. 2



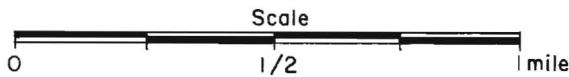
SECTION 21



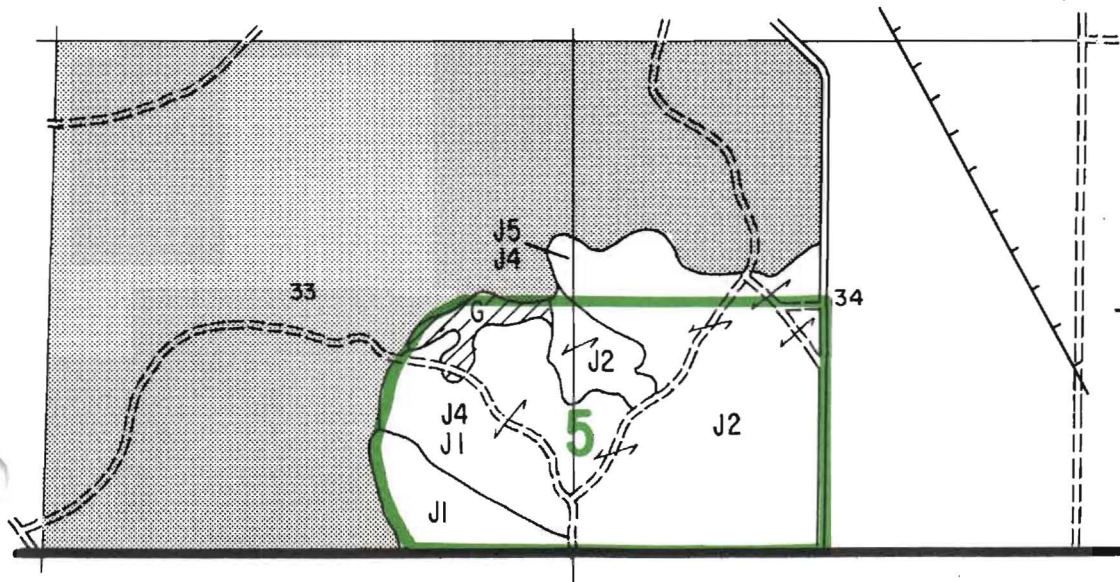
SECTIONS 23, 24, 25, 26

**STALEY LAKE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO.2)**

T 26N , R 3W ; CRAWFORD CO. MICH.



- Not habitat
- Marginal habitat

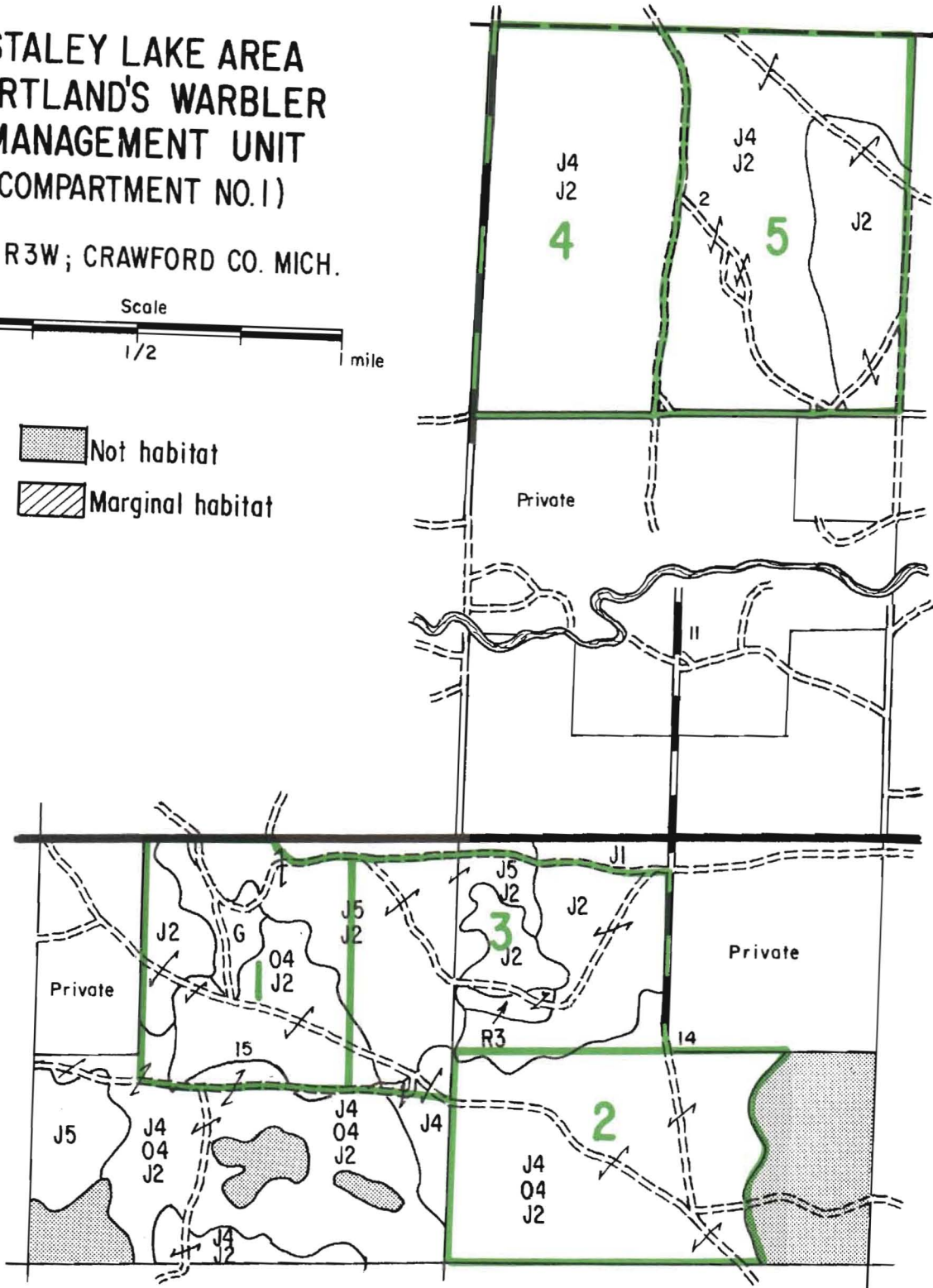
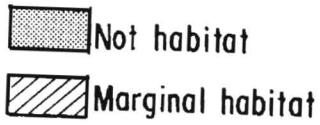
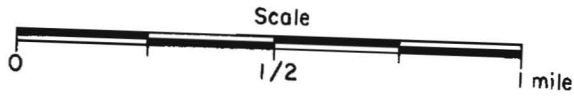


SECTIONS 33, 34

CUTTING BLOCKS-Compartment No. 1

**STALEY LAKE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO.1)**

T 26N, R 3W; CRAWFORD CO. MICH.



FLETCHER ROAD KIRTLAND'S WARBLER MANAGEMENT AREA

Crawford County and Kalkaska County
T25N R4W and T25N R5W

Inventory Compartments:

Pere Marquette State Forest, Kalkaska Area	42	(Management Unit 1)
	48	(Management Unit 2)
Au Sable State Forest, Roscommon Area:	189	(Management Unit 3)

Area Description

- A. General location and background information: The Fletcher Road Kirtland's Warbler Management Area is in the southeast corner of Kalkaska County and southwest corner of Crawford County. It lies about five miles northwest of Higgins Lake.

Grayling sand, Graycalm sand, and Rubicon sand are the soil types. The most ideal habitat is on Grayling sand with other sands interspersed in spatial location between the Grayling sand and entirely unsuitable types. Portions of the Area having Graycalm and Rubicon sands appear to be only marginally suitable for warbler nesting. These marginal sites have a strong natural tendency to convert to aspen and upland brush types following clearcutting if not carefully managed. Much of Management Unit 3 is of marginal quality.

Significant portions of Management Units 1 and 2 and a portion of Management Unit 3 were burned by the Fletcher Burn, a wildfire, in 1968.

- B. Land ownership patterns: A recent land acquisition has helped considerably to block in State ownership in the Fletcher Road Kirtland's Warbler Management Area. Only eight acres remain to be acquired. This parcel of land is in section 22 of T25N R5W.
- C. Status of other resources: An oil field of considerable extent is located to the northeast of this Area. It most directly affects management in Management Unit 3. Of equal importance of concern with the wells themselves are the system of above ground gas and oil pipelines and oil storage tanks. Their presence must be well noted prior to prescribed burning.

In the past, military units operating out of Camp Grayling have used parts of the Area for maneuvers. Impacts of future operations should be carefully considered prior to issuance of permits.

Fletcher Road is a lightly used paved road serving primarily local residents, cottage owners, and oil company personnel. Some consideration to the visual impact of large clearcuts should be given.

- D. Kirtland's warbler occupancy history: Known records show that Kirtland's Warblers nested in this area since the 1940's. The Museum of Zoology, University of Michigan, has a specimen dated June 21, 1948. This specimen was collected in section 27, T25N R5W. The 1951 census showed 28 males in Kalkaska County, most of which were in the Fletcher Road Area. In 1961, 32 birds were located in the Area. Just previous to the 1968 burn, only two birds occupied the Fletcher Road Area. Warblers returned to the burn area in 1975 when three singing males were located. Kirtland's warblers have been increasing every since: in 1976 there were seven males, 11 in 1977, 16 in 1978 and 21 in 1979.

Fletcher Road Area
Kalkaska & Crawford Counties

Management Unit 1. Y.O.E. --- 7

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1977	1	J2	2	186
		2	J3	No treatment for 1977	<u>34</u>
TOTAL					220

Comments: The J2 stand was planted in spring 1977. This planting represents the 1977 entry.

2	1987	3	J3	19	138
		4	J5R4	57	23
		5	<u>J4</u> J2	<u>19</u>	8
		6	J1	19	4
		7	G		<u>136</u>
TOTAL					310

Comments: No cutting is planned for the 1987 Y.O.E. Treatment, however, will be to plant the G type to jack pine. This G type has been periodically used as a bivouac area by the National Guard.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	1997	8	J3	29	254
		9	$\frac{J4}{J2}$	<u>29</u>	20
		10	J5R4	47	17
		11	J1	29	2
		12	G		<u>14</u>
				TOTAL	307

Comments: The A1 stand of course is not Kirtland's Warbler habitat. Whether or not this is cut with the rest of the Block is at the discretion of the Area Forester.
Note that the NW 1/4 of section 24 was acquired by the state as scarce habitat.

*4	2007	14	J5	77	12
		15	J3	39	400
		16	J1	39	<u>25</u>
				TOTAL	437

Comments: This is a large block. The 437 acres assumes that the private eighty in the E 1/2 of the SE 1/4 of section 22 can be acquired by the State for Kirtland's Warbler habitat. At the time of this writing, acquisition appears to be good. The large size of the block will still permit a viable management cutting block in the event that the eight should not be acquired. Furthermore, the large size of Cutting Block 4 should help to mitigate the effects of encroaching aspen and brush which at present is approximately 25 acres.

5	2017	17	J3	49	254
		18	J0	40	<u>28</u>
				TOTAL	282

Comments: The cutting of the aspen types in the north part of this Block may be at the discretion of the Area Forester.

Management Unit 2. Y.O.E. --- 8

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1978	1	J5	50	100
		2	G		63
		3	J1	9	10
		4	J2	21	2
		5	<u>J5</u> J2	<u>50</u> 36	6
		6	J6	48	12
		7	J1	16	<u>9</u>
TOTAL					202

Comments: The miscellaneous type is predominately aspen, willow and black cherry. This type is found in the south portion of the Cutting Block. Perhaps with a hot enough burn during July or August this site may be set back enough to provide potential habitat. However, the ability of Block 1 to provide suitable habitat should not be significantly decreased if this type is not converted to jack pine.

2	1988	8	J6	58	127
		9	J5	60	32
		10	<u>J5</u> J2	<u>60</u> 46	64
		11	G		<u>42</u>
TOTAL					265

Comments:

3	1998	12	J5R5	63	171
		13	J3	29	<u>55</u>
TOTAL					226

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
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4	2008	14	J3	39	<u>200</u>
				TOTAL	200

Comments:

5	2018	15	J3	49	<u>313</u>
				TOTAL	313

Comments:

Management Unit 3. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1979	25	J5	63	80
		1	J5	53	153
		2	$\frac{J4}{J2}$	$\frac{21}{21}$	<u>7</u>
TOTAL					240

Comments: This Block must be burned following cutting.

*2	1989	3	$\frac{J4}{J2}$	21 ← $\frac{31}{31}$	12
		4	$\frac{J5}{J5}$	53 ← $\frac{63}{63}$	132
		5	J4	58 ← 68	12
		6	$\frac{J5}{J2}$	55 ← $\frac{65}{21}$ 21 ← 31	<u>76</u>
TOTAL					232

Comments: Cut and burn this Cutting Block in 1979 with Cutting Block 1 to avoid loss in pulpwood production and provide more immediate habitat. This Block will then not be entered in 1989 but will be entered in fifty years from 1989 (2039). After cutting, the Block must be burned.

*3	1999	7	J6	66 ← 76	18
		8	J5	59 ← 69	154
		9	$\frac{J4}{J4}$	61 ← $\frac{71}{59}$ 59 ← 69	145
TOTAL					317

Comments: Cut and burn this Cutting Block in 1989 to avoid loss in pulpwood production and to provide more immediate habitat. This Block will then not be entered in 1999 but will be entered in fifty years from 1999 (2049). After cutting, the Block must be burned.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2009	10	<u>J4</u> J3	71 ← <u>81</u> 29 ← 39	71
		14	<u>J4</u> J2	68 ← <u>78</u> 45 ← 55	67
		11	<u>R4</u> J4	66 ← <u>76</u> 74 84	62
		12	J2	46 56	14
		13	J5	69 79	<u>92</u>
TOTAL					306

Comments: Cut and burn this Block in 1999 to insure continuity of jack pine habitat.

5-1	2019	15	J3	50	220
		16	J1A1	77	53
		17	J5	61 ← 91	<u>11</u>
TOTAL					284
5-2	2019	18	J2	60	125
		19	<u>J5</u> J1	<u>80</u> 60	<u>112</u>
TOTAL					237

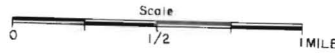
Comments: Two Block 5's are being considered (labeled 5-1 and 5-2) in Section T25N, R4W), however, both blocks have oil wells and above ground oil and gas lines. It is proposed that the recommendation concerning Block 5 be in abeyance until a future time when more information is at hand.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (;) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

FLETCHER ROAD AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

KALKASKA and CRAWFORD COUNTIES, MICHIGAN

T 25 N, R 4 and 5 W

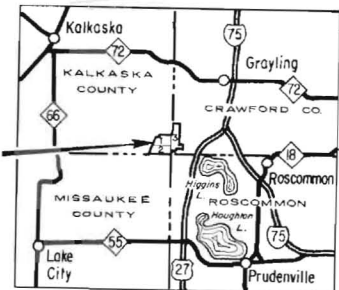
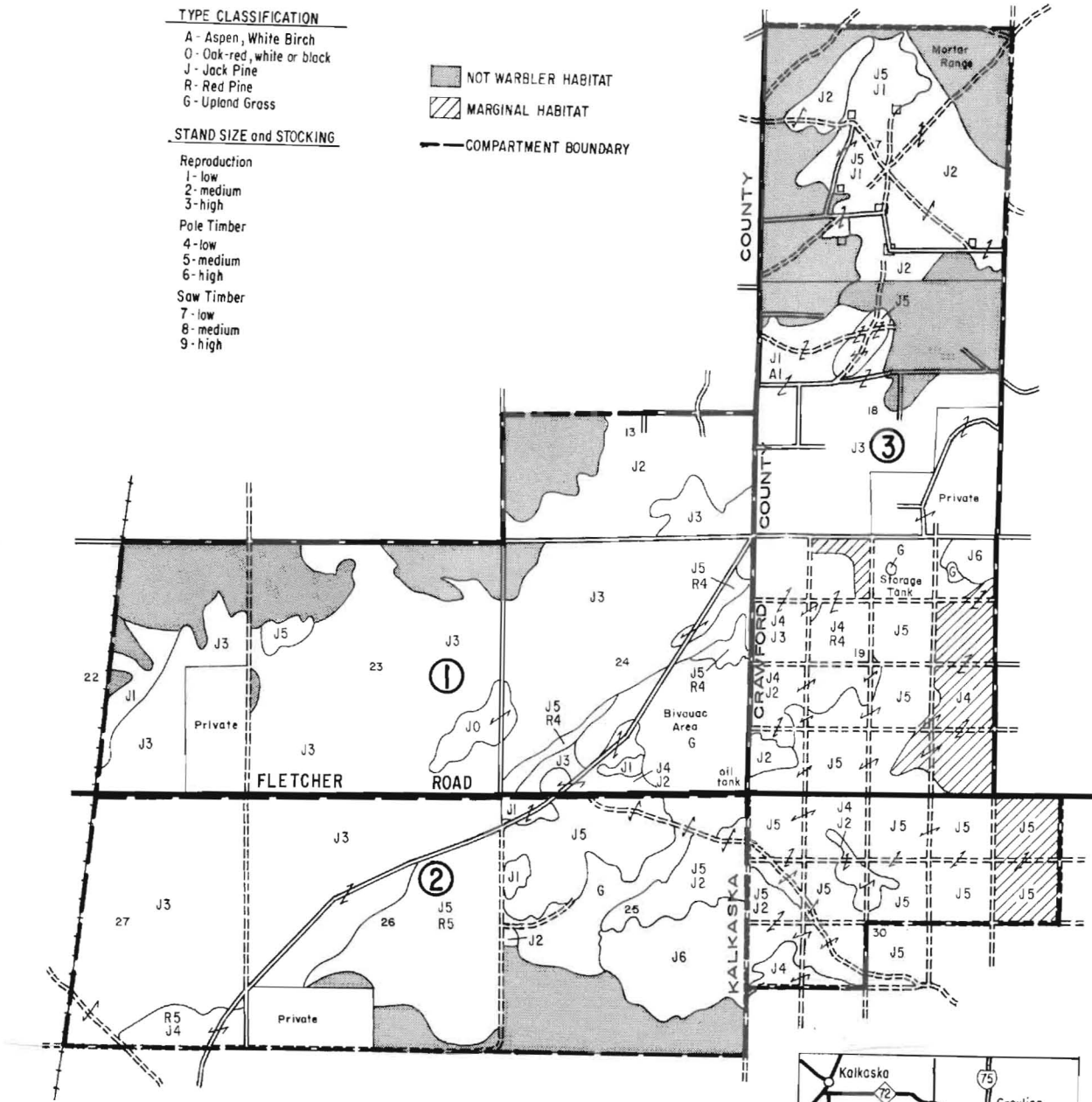


- TYPE CLASSIFICATION**
- A - Aspen, White Birch
 - O - Oak-red, white or black
 - J - Jack Pine
 - R - Red Pine
 - G - Upland Grass

STAND SIZE and STOCKING

- Reproduction**
- 1 - low
 - 2 - medium
 - 3 - high
- Pole Timber**
- 4 - low
 - 5 - medium
 - 6 - high
- Saw Timber**
- 7 - low
 - 8 - medium
 - 9 - high

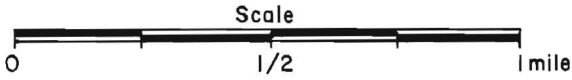
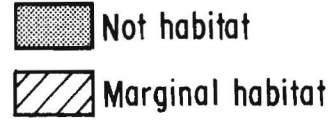
- NOT WARBLER HABITAT
- ▨ MARGINAL HABITAT
- - - COMPARTMENT BOUNDARY



CUTTING BLOCKS - Compartment 2

FLETCHER ROAD AREA KIRTLAND'S WARBLER MANAGEMENT UNIT (COMPARTMENT NO. 2)

T 25N, R 5W ; KALKASKA CO. MICH.



FOREST TREATMENT PROPOSAL

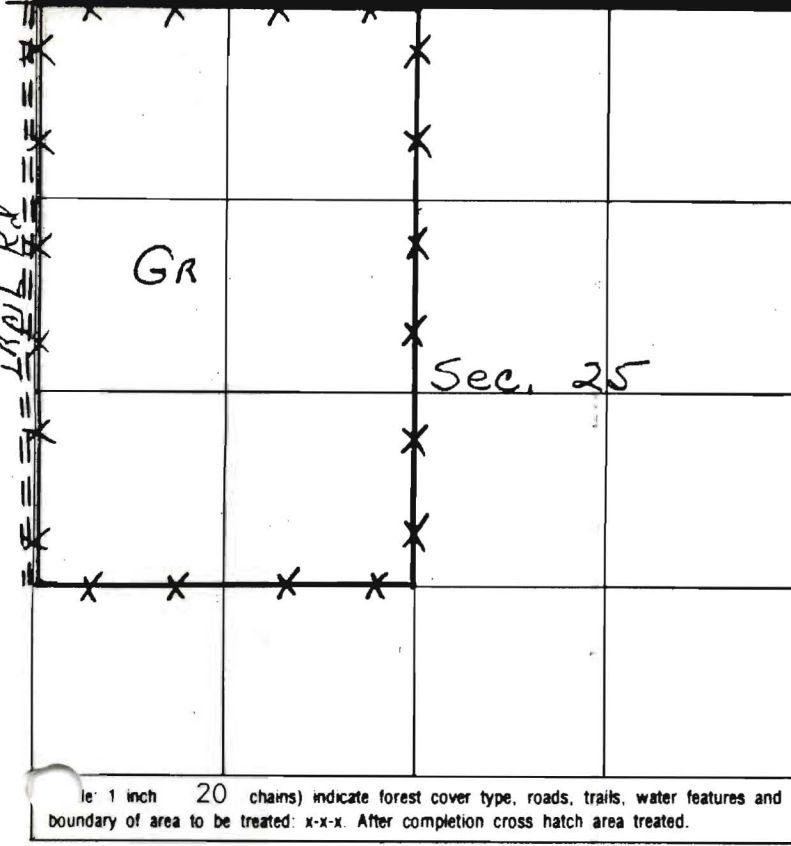
Check if applicable BURNING PLANTING SEEDING

LOCATION (State Forest, Game Area, Etc.)
 Peré Marquette State Forest - Kalkaska Forest Area

PROPOSAL NO. **W-62-76**

COUNTY: Kalkaska T 25N R 5W SEC. 25 SUB.N/2 SW/4 ¼ TWP 4 COMP. NO. 48 STAND NO. 5

ADDITIONAL STAND NOS., if applicable: *Co. Rd* *cutting blk 1* *5+ds 1-7 plus extra*



Scale: 1 inch = 20 chains. 'x-x-x' indicates forest cover type, roads, trails, water features and boundary of area to be treated. 'x' indicates completion cross hatch area treated.

TREATMENT PROPOSED
 Jack Pine planting.

COVER TYPE OBJECTIVE Jack Pine	WILDLIFE SPP OBJECTIVE Kirtland Warbler	ACRES TO TREAT 240
-----------------------------------	--	-----------------------

RECOMMENDED METHOD(S)
 Machine plant.

JOB SPECIFICATIONS

1. Open plant jack pine.
2. Leave 30 to 40% of area open using a wave pattern.
3. Plant on a east-west direction.
4. Wave pattern to be laid out by Wildlife personnel.

PRESENT CONDITIONS

COVER TYPE Grass	SOIL TYPE Grayling Sand	SITE INDEX - SPP 42 J. Pine	YR. OF STAND ORIGIN --
GROUND COVER SPP	TOPOGRAPHY <input type="checkbox"/> LEVEL <input type="checkbox"/> ROLLING <input type="checkbox"/> STEEP		

	LIGHT	MED.	HEAVY	BASAL AREA SUMMARY	
STUMPS				B.A.	SPP.
SLASH				SAPS	
ROCKS				POLES	
BRUSH				SAW	
				TOTAL	0 0

MATERIALS NEEDED (chemicals, planting stock, etc.)

ITEM	UNITS	# PER ACRE	TOTAL UNITS	COST
Jack Pine Class 2-0		1200	201,600	4234.00

OTHER SPECIAL NEEDS

Planting machine, tractor & manpower.	\$50.00/M trees.		10,080.00
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ESTIMATED COSTS	\$/acre	Total
	\$85.00	\$14,314.00

COMMENTS:

This area is part of the Fletcher Road Kirtland Warbler Management Area; year of entry 1978. Management Unit #2, cutting Block #1. Area was burned in 1979.

BURN PRESCRIPTION (for burning only)

AIR TEMP.	WIND SPEED-DIRECTION	10-HR STICK MOISTURE (%)	FUEL LOAD (tons/A)	REL. HUM.
SEASON TO BURN (months)		LIKELY TO ACHIEVE OBJECTIVES? (explain) <input type="checkbox"/> YES <input type="checkbox"/> NO	DATE OF PRESCRIPTION	
BY			TITLE	

PLANTATION PEST RISK RATING (for planting only)

INDICATE GROUND COVER TYPES ON MAP:
 Gb = blueberry Gs = sweetfern Gw = other weeds
 Gbr = bracken Gr = grasses Ⓢ = sand blows

NEAREST PINE PLANTATION (Region II only)
 < ¼ mi ¼ - ½ ½ - 1 > 1 mi

PINE SPECIES IN NEAREST PLANTATION **RED + JACK PINE**

PINE ROOT COLLAR WEEVIL PRESENT? YES NO

PREPARED BY Raymond Perez	TITLE Wildlife Hab. Blo.	DATE 2/6/80
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APPROVALS

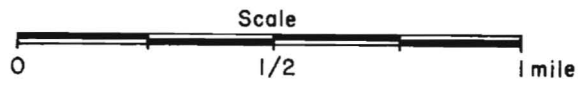
AREA FORESTER <i>Robert Slater</i> 2-11-80	DATE	DISTRICT FORESTER <i>M. Salcedo</i> 2/12/80	DATE
HABITAT BIOLOGIST <i>Compton</i> 2-7-80	DATE	DISTRICT BIOLOGIST <i>Howard</i> 2/12/80	DATE

FEB 12 1980

CUTTING BLOCKS - Compartment 3

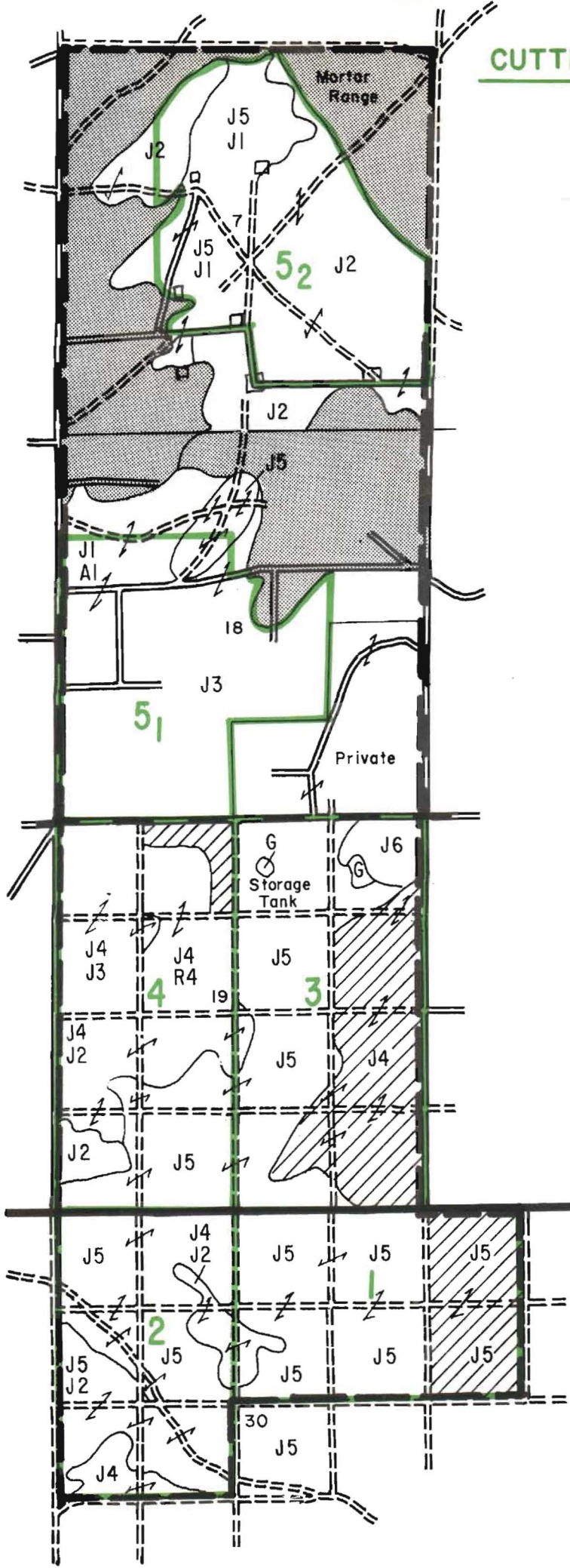
**FLETCHER ROAD AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 3)**

T 25N, R 4W ; CRAWFORD CO. MICH.



- Not habitat
- Marginal habitat

MICHIGAN
DEPARTMENT OF NATURAL RESOURCES



MANISTEE RIVER KIRTLAND'S WARBLER MANAGEMENT AREA

Crawford County and Kalkaska County
T27N R4W and T27N R5W

Inventory Compartments:

Pere Marquette State Forest, Kalkaska Area	12 (Management Unit 1)
Au Sable State Forest, Roscommon Area	175 (Management Unit 2)
	179 (Management Unit 3)

Area Description

- A. General location and background information: The Manistee River Kirtland's Warbler Management Area straddles the boundaries of the Pere Marquette and Au Sable State Forests and Kalkaska and Crawford counties. Management Unit 1 is located in the Pere Marquette State Forest and Kalkaska County, while Units 2 and 3 are in the Au Sable State Forest and Crawford County.

The Area lies five to nine miles northwest of Grayling on the flat Grayling sand and Graycalm sand plains, bisected by the Manistee River. On much of the Area, sites are moister than what is generally considered ideal. Prescribed burning with hot fires is an important management tool, needed to control the heavier brush and denser grass which otherwise the site would revert to following cutting.

- B. Land ownership patterns: Land ownership for the most suitable warbler sites is with the State of Michigan. No need is seen for acquisition of land in the Manistee River Area. However, due to private ownership adjacent to cutting blocks, prescribed burning will need to be executed with caution.
- C. Status of other resources: Habitat cuts should be designed to minimize adverse visual impact along the relatively well used Goose Creek Road and Manistee River Road. These roads are used by tourists and vacationers in the area.

At present the Shore-to-Shore Riding and Hiking Trail is routed through Cutting Blocks 1 and 5 of Management Unit 1 and Cutting Blocks 2 and 4 of Management Unit 2. It is unlikely that the quiet activity for which this trail was designed will present harassment to nesting warblers in the future, but the option of possible re-routing of this segment of the trail should be kept open.

The Michigan Cross Country Cycle Trail enters a portion of Cutting Block 1 of Management Unit 1. At the time that Block has occupiable habitat, it may be necessary to re-route this trail. Re-routing should be a relatively simple task.

- D. Kirtland's warbler occupancy history: The Museum of Zoology, University of Michigan, has several specimens that were collected about six miles west of Grayling, which would put the locations on or near this Management Area. These warblers were collected in 1938 and in 1939. The 1961 census did not show any warblers in this Area. As of today, no warblers are known to be nesting in the Area.

MANISTEE RIVER AREA

Crawford and Kalkaska Counties

Management Unit 1. Y.O.E. --- 5

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1985	1	J4R4	47	166
		2	J2	22	47
		3	G		<u>16</u>
TOTAL					229

Comments: Ground cover consisting of bracken fern and sand cherry indicates a site which could revert to species undesirable for warbler use. Therefore, this Block must be burned with a hot fire following harvest. A summer burn is recommended.

At present, both the Shore-to-Shore Riding and Hiking Trail and the Cross Country Cycle Trail run through this Block.

2	1995	4	U		24
		5	J4	<u>57</u>	98
			J2	32	
		6	J4R4	<u>51</u>	40
J2	32				
7		J4R4	<u>52</u>	<u>3</u>	
		J1	32		
TOTAL					165

Comments: Ground cover consisting of bracken fern, sand, and an occasional small aspen clone indicates a site which could revert to species undesirable for warbler use. Therefore, this Block must be burned with a hot fire and it is recommended that an acceptable silvicide such as Tordon or Amdon be applied manually to control aspen spread. Note the oil pipeline through this Block which may influence management practices.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	2005	8	<u>J4</u> <u>J2</u>	<u>67</u> <u>42</u>	15
		9	U		19
		10	<u>J4R4</u> <u>J1</u>	<u>62</u> <u>42</u>	40
		11	G		6
		12	<u>J4</u> <u>J2</u>	<u>61</u> <u>47</u>	<u>92</u>
TOTAL					172

Comments: This Block should be burned with a hot fire, preferably in summer to favor vegetative species desirable for the Kirtland's Warbler. Note the oil pipeline through this Block which may influence management practices.

4	2015	13	G		36
		14	U		26
		15	J2	52	41
		16	<u>J4</u> <u>J2</u>	<u>77</u> <u>52</u>	49
		17	<u>J4R4</u> <u>J2</u>	<u>71</u> <u>52</u>	55
		18	<u>J4</u> <u>J2</u>	<u>77</u> <u>52</u>	<u>5</u>
TOTAL					212

Comments: This Block should be burned with a hot fire, preferably in summer to favor vegetative species desirable for the Kirtland's Warbler. Note the oil pipeline through this Block which may influence management practices.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
5	2025	19	J2	62	220
		20	J4R4	87	<u>5</u>
				TOTAL	225

Comments: Due to species of ground vegetation, this Block should have a fairly high priority for prescribed burning following cutting. Stand 19 contains reproduction of various ages. At present, the Shore-to-Shore Riding and Hiking Trail passes through Block 5.

Management Unit 2. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1983	1	J6	67	28
		2	J4	60	15
		3	J1	19	36
		4	<u>J4</u> <u>J1</u>	<u>61</u> <u>20</u>	111
		5	<u>J4</u> <u>J2</u>	<u>53</u> <u>15</u>	95
		6	J5	51	18
		7	<u>J4R4</u> <u>J1</u>	<u>41</u>	<u>8</u>
TOTAL					311

Comments: Due to species of ground vegetation, this Block should have fairly high priority for prescribed burning following cutting.

2	1993	8	<u>J4</u> <u>J2</u>	<u>54</u> <u>25</u>	155
		9	G		21
		10	G		<u>26</u>
TOTAL					202

Comments: At present, the Shore-to-Shore Riding and Hiking Trail passes through this Block.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2003	11	J4 J2	67 45	73
		12	J4R4 J2	62 40	57
		13	J2	41	36
		14	J4	65 ← 90	20
TOTAL					186

Comments: Due to the presence of indicator species such as bracken fern, this Cutting Block must be burned hot following cutting.

At the time of the stand inventory in 1978, many trees in Stand 14 were overmature and being lost. It is therefore recommended that this stand be cut as soon as possible to avoid further loss. It will, of course, be regenerated with the remainder of the Block in 2003.

*4	2013	15	J5	53 ← 88	7
		16	R2	56	117
		17	J3	58	138
		18	U		58
		19	O705		3
TOTAL					323

Comments: This Block must be burned following cutting. The aspen clones invading in some areas may be controlled through the use of Tordon, Amdon, or some other acceptable silvicide. The J5 stand may be cut as soon as possible. At present, the Shore-to-Shore Riding and Hiking Trail passes through Block 4.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2023	20	J2	61	180
		21	<u>J4R4</u> J1	<u>81</u>	43
		22	J5	67 ← 112	<u>13</u>
				TOTAL	236

Comments: Stand 22 should be cut as soon as possible to prevent further loss due to natural mortality.

Stand 20 is a mixture of uneven aged reproduction.

Management Unit 3. Y.O.E. --- 1

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1981	1	J6	58	129
		2	<u>J4</u> J2	<u>53</u> 23	66
		3	<u>O4J4</u> J2	<u>55</u> 13	13
		4	G		18
		5	Misc. oak types		<u>20</u>
				TOTAL	246

Comments: This Cutting Block should be burned following cutting.

2	1991	6	J6	65	110
		7	<u>J4</u> J2	<u>53</u> 23	<u>60</u>
				TOTAL	170

Comments: Burn Block 2 following cutting.

*3	2001	8	J4J3	51	38
		9	J6	63 ← 83	19
		10	<u>J4</u> J2	55 ← <u>75</u> 43	61
		11	J4R4	50	11
		12	J1	35	<u>31</u>
				TOTAL	160

Comments: The J6 stand and the J4 overstory in the J4/J2 stand should be cut as soon as possible to salvage mature jack pine timber. This Block should be burned following the 2001 cut.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2011	13	J4R4	68	45
		14	<u>J4</u> J2	<u>75</u> 58	20
		15	J1	53	46
		16	J1	45	<u>40</u>
				TOTAL	151

Comments: Block 4 should be burned following cutting to control undesirable vegetation.

5	2021	17	J1	55	237
		18	<u>J4</u> J2	<u>85</u> 68	<u>3</u>
				TOTAL	240

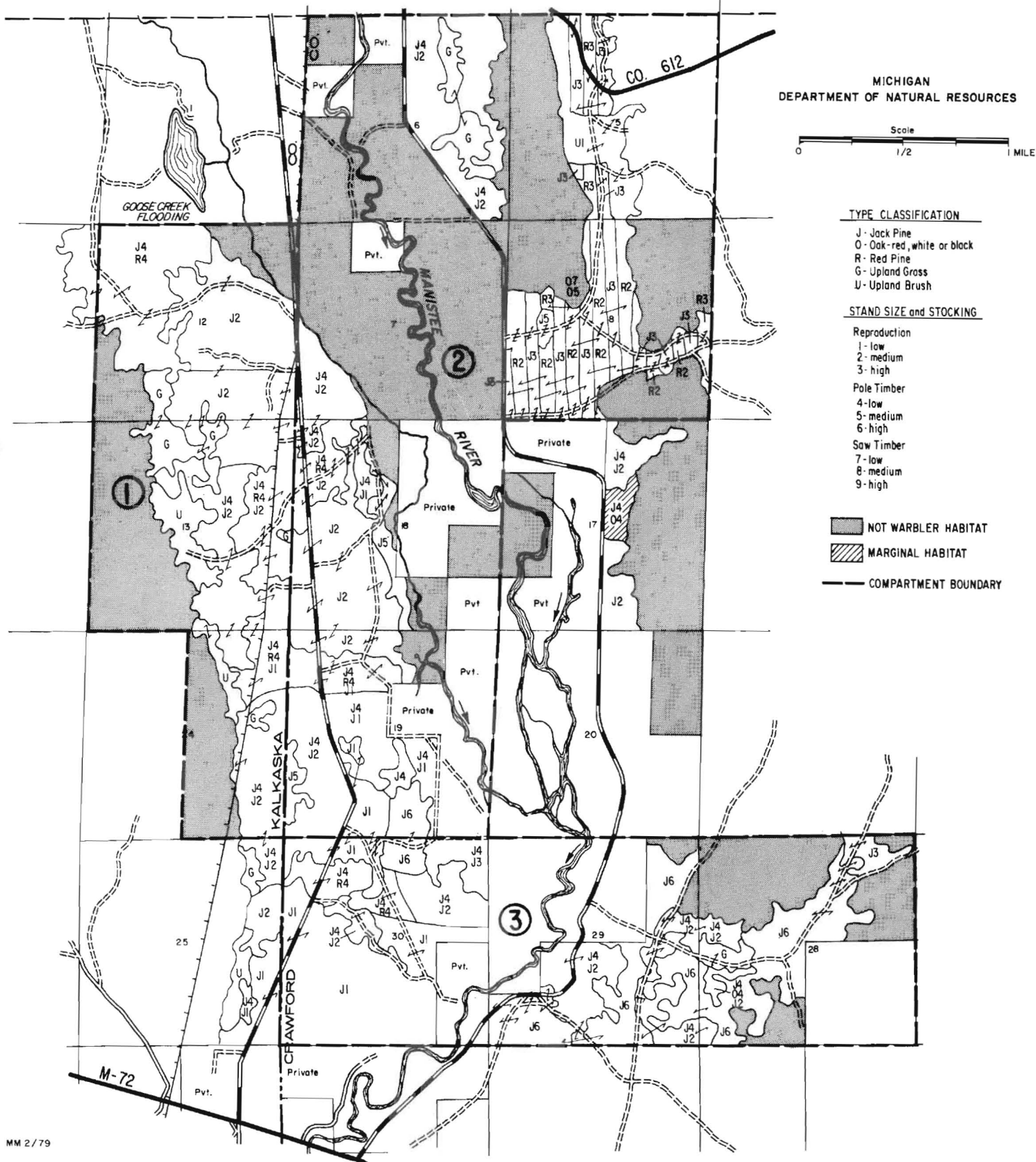
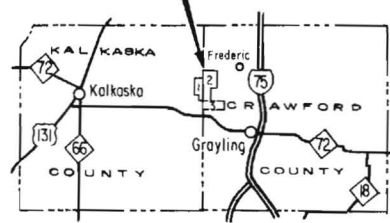
Comments:

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

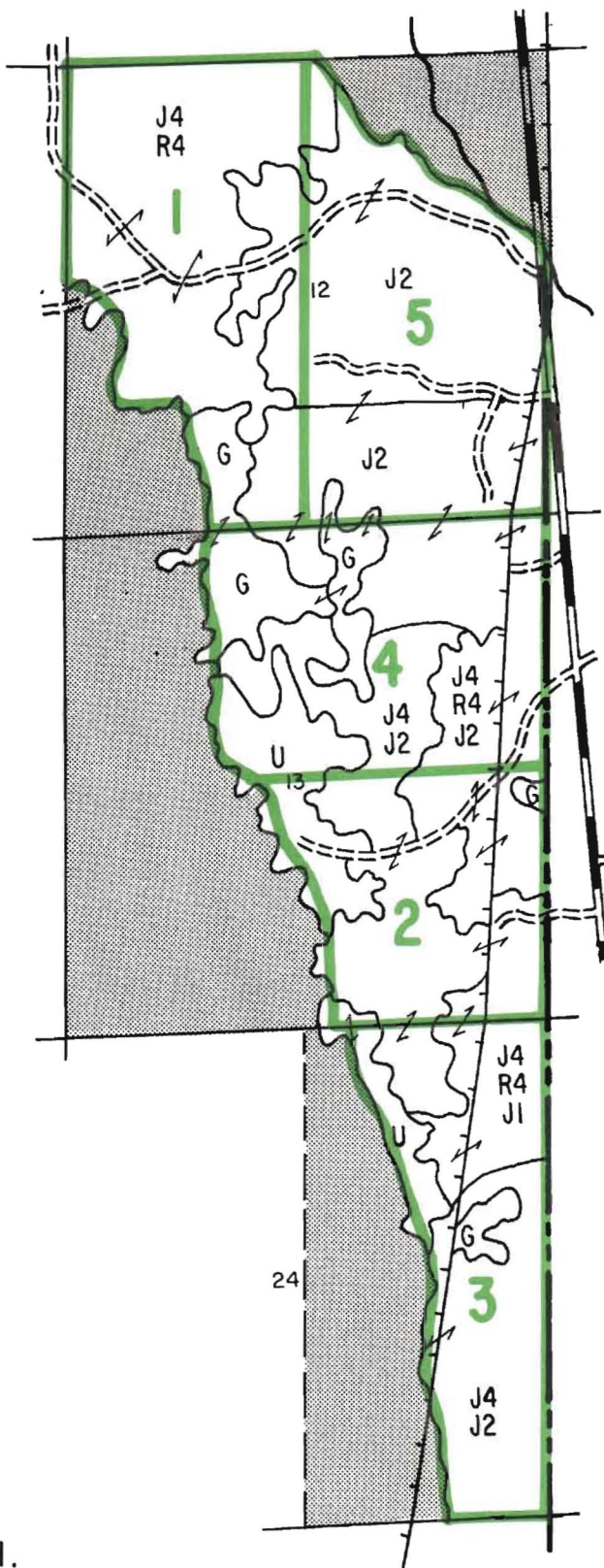
MANISTEE RIVER AREA KIRTLAND'S WARBLER MANAGEMENT UNITS



KALKASKA & CRAWFORD CO'S., MICH.
T 27 N, R 4 & 5 W

MANISTEE RIVER AREA
KIRTLAND'S WARBLER
MANAGEMENT UNITS



CUTTING BLOCKS-
Compartment I

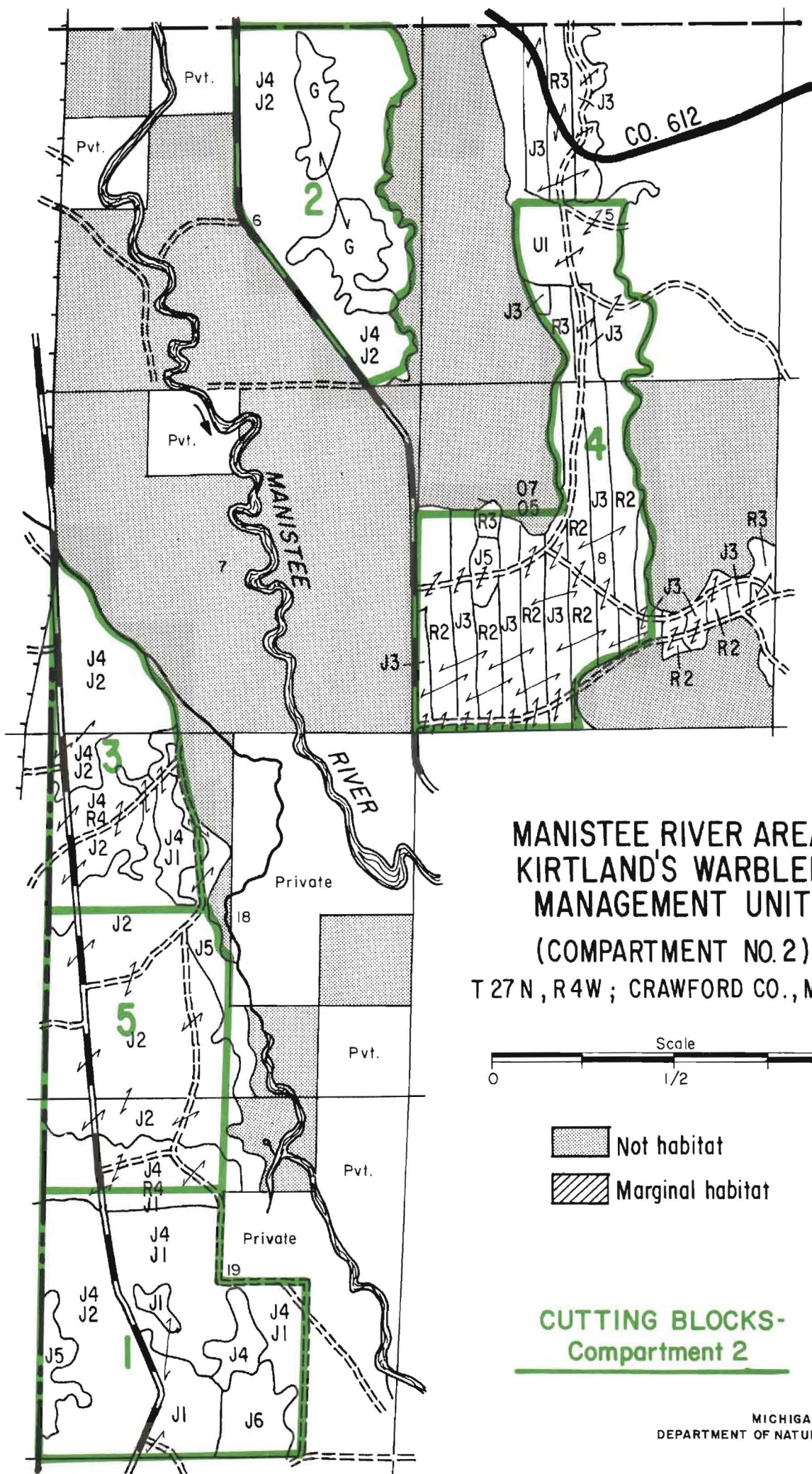


-  Not habitat
-  Marginal habitat

MANISTEE RIVER AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 1)

T 27 N, R 5 W; KALKASKA CO., MICH.





**MANISTEE RIVER AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT**

(COMPARTMENT NO. 2)

T 27 N, R 4 W ; CRAWFORD CO., MICH.



**CUTTING BLOCKS-
Compartment 2**

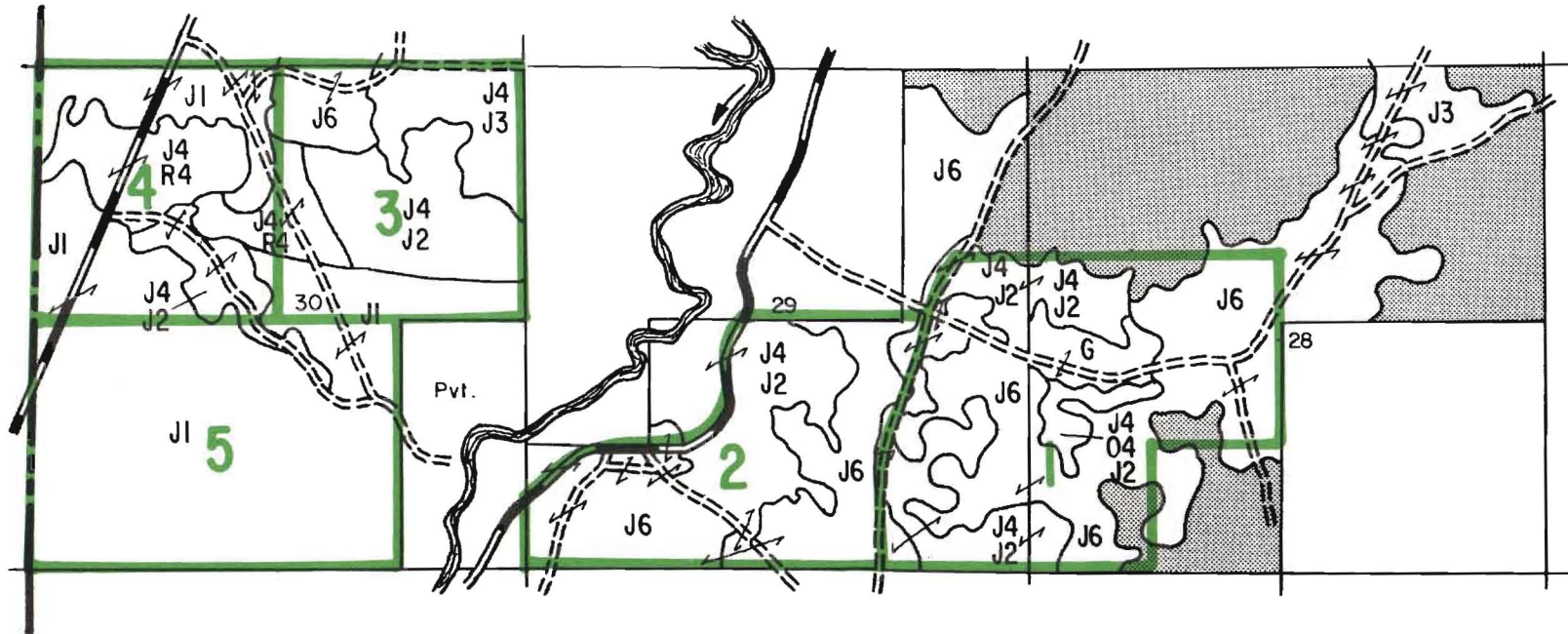
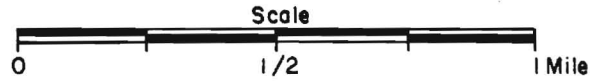
**CUTTING BLOCKS-
Compartment 3**

**MANISTEE RIVER AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT**

(COMPARTMENT NO.3)

T 27 N, R 4 W; CRAWFORD CO., MICH.

-  Not habitat
-  Marginal habitat



SHARON KIRTLAND'S WARBLER MANAGEMENT AREA

Kalkaska County
T25N R6W and T26N R6W

Inventory Compartments:

Pere Marquette State Forest, Kalkaska Area	34 (Management Unit 1)
	35 (Management Unit 2)
	45 (Management Unit 3)
	37 (Management Unit 4)

Area Description

- A. General location and background information: The Sharon Kirtland's Warbler Management Area is located in south central Kalkaska County south of the Manistee River. The Village of Kalkaska lies approximately thirteen miles to the northwest of the Area.
- Soils in the Sharon Area tend to be more fertile than those of most other Areas. The percentage of Grayling sand is relatively low with the majority of the Management Area occurring on what was typed in 1927 as Rubicon sand. (Some of this may in fact be Graycalm sand.) Management of the Sharon Area will need to be intensive to retard conversion to non-warbler habitat. This high degree of management will be especially needed in the peripheral areas.
- B. Land ownership patterns: Land ownership patterns are not significantly constraining to management. Several parcels have medium priority for acquisition.
- C. Status of other resources: Cottages are found on most of the private lands within and adjacent to the Management Area. Fletcher Road and Sharon Road are used moderately by local residents and cottage visitors. Cutting and burning should be done with some consideration to the private dwellings and driving in the area.
- Management Unit 4 borders the Sharon Quarter Township Wildlife Research Unit.
- D. Kirtland's warbler occupancy history: There are no known records that Kirtland's Warblers ever nested in this area, although some maps show this area as part of its breeding grounds. The nearest Area which now has warblers is the Fletcher Road Area, which is about four miles away.

SHARON AREA
Kalkaska Conty

Management Unit 1. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1983	1	J4 J1	68 20	187
		2	J5	55	10
		3	G		26
		4	M4J1		<u>6</u>
TOTAL					229

Comments: The M4J1 stand is included to square off this Cutting Block. After cutting, this Block should have high priority for burning and regenerating to jack pine, since parts of it may be lost to warbler habitat if the jack pine type with sparse ground cover is not maintained. The burn should be hot and preferably in the summer months.

2	1993	5	J6	66	74
		6	J1	31	3
		8	J1	25	9
		9	J4 J1	<u>40 to 70</u> 35	138
		10	J5	71	50
		11	R2	32	33
		13	G		<u>13</u>
TOTAL					320

Comments: This Block must be burned with a hot fire, preferably in July or August, following cutting.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	2003	14	R2	41	40
		15	<u>J4</u> J1	<u>50 to 80</u> 45	40
		16	J5	62 ← 82	38
		17	J4J2	60	<u>104</u>
				TOTAL	222

Comments: This stand must be burned hot, preferably in July or August. Stand 16 could be cut as soon as possible.

4	2013	18	<u>J4</u> J2R1	57 ← <u>77</u> 53	40
		19	J4R4	69	12
		20	R2J1	50	89
		21	<u>J4R4</u> R2J1	<u>64</u> 48	<u>54</u>
		22	R3	50	<u>37</u>
				TOTAL	232

Comments: This Block may need to have the occasional aspen clones killed prior to re-establishing the new stand. Any aspen which is killed should be killed with an acceptable silvicide such as Tordon or Amdon prior to prescribed burning. Parts of Cutting Block 4 tend to be of marginal habitat potential so this Block must be burned with a hot fire preferably in July or August.

5	2023	23	R2	62	<u>164</u>
				TOTAL	164

Comments:

TREATMENT RECORD

SHARON MANAGEMENT AREA

MANAGEMENT UNIT NO. 1 INVENTORY COMPARTMENT NO. 34

Cutting Block	Year of Entry	Stand Number	Timber Sale		Prescribed Burn			Regeneration			Other Treatments	Comments
			Date Started	Date Completed	Proposal Number	Priority (1 or 2)	Date Completed	Method	Proposal Number	Date Completed		

101

Management Unit 2. Y.O.E. --- 1

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1981	1	G		101
		2	<u>J4</u> J1	<u>39</u> 23	18
		3	<u>J4</u> J1	<u>43</u> 23	15
		4	J2	16	31
		5	<u>J4</u> J2	<u>57</u> 23	87
		6	<u>J4</u> J2	<u>49</u> 33	<u>11</u>
				TOTAL	263

Comments: Burn stand with a hot fire following cutting, preferably in July or August. Regenerate Block to jack pine.

2	1991	7	<u>J4</u> J2	<u>63</u> 43	32
		8	G		10
		9	G		33
		10	J5	62	13
		11	<u>J4</u> J2	<u>60</u> 33	19
		12	U		48
		13	J1	30	7
		14	U		<u>40</u>
				TOTAL	202

Comments: Burn stand with a hot fire following cutting, preferably in July or August.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	2001	15	G		86
		16	$\frac{J4}{J2}$	$\frac{73}{53}$	3
		17	$\frac{J4}{J2}$	$\frac{65}{48}$	<u>71</u>
				TOTAL	160

Comments: Burn stand with a hot fire following cutting, preferably in July or August.

*4	2011	18	G		75
		19	J1	37	68
		20	U		<u>17</u>
				TOTAL	160

Comments: Plant Block 4 in 1981 at the same time that Block 1 (and Block 5) is being regenerated. This should provide habitable aged jack pine in the near future and 30 year old jack pine for likely commercial cutting in 2011. In 2011, Block 4 will be cut, burned with a hot fire, preferably in July or August, and regenerated to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2021	21	G		22
		22	$\frac{J4}{J2}$	← $\frac{80}{53}$	10
		23	J1	45	8
		24	$\frac{J4}{J2}$	← $\frac{107}{76}$	12
		25	U		159
		26	$\frac{J4}{J2}$	← $\frac{80}{76}$	12
		27	J1	45	<u>12</u>
				TOTAL	235

Comments: Plant Block in 1981 at the same time that Block 1 (and Block 4) is being regenerated. This should provide habitable aged jack pine in the near future and 40 year old jack pine for commercial cutting in 2021. In 2021, Block 5 will be cut, burned with a hot fire, preferably in July or August, and regenerated to jack pine. The overstories of some of the stands may be cut sooner than 2021.

Management Unit 3. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1979	1	<u>J4</u> J1	<u>47</u> 26	81
		2	G		28
		3	J1	next rotation	<u>102</u>
TOTAL					211

Comments: Stand 1 must be cut as soon as possible. Stands 1 and 2 must then be burned with a hot fire and planted to jack pine. These two stands, together with Stand 3, will provide a block of even-aged jack pine of suitable size to hopefully attract warblers.

2	1989	4	U		212
		5	<u>J5</u> J1	<u>51</u>	<u>13</u>
TOTAL					225

Comments: After cutting the commercial trees in Cutting Block 2, any aspen in this block should be treated with an acceptable silvicide such as Tordon or Amdon followed by a hot fire, preferably in July or August, to control bracken fern and brush in the Block. Plant to jack pine.

3	1999	6	U		135
		7	<u>J4</u> J1	<u>65</u> 39	<u>30</u>
TOTAL					165

Comments: Treat this Block like Cutting Block 2. Specifically, cut, treat aspen, burn with a hot fire and plant to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2009	8	J1	33	77
		9	<u>J4</u> J1	<u>61</u> 51	64
		10	J5	← 88	14
		11	G		<u>24</u>
				TOTAL	179

Comments: Stand 10 may be cut prior to 2009. This Block should be cut and burned with a hot fire then planted to jack pine. Burning would accomplish the most good if done in July or August.

5	2019	12	G		35
		13	<u>J4</u> J2	← <u>83</u> ← 76	9
		14	J4J2	← 78	20
		15	R4J4 J1	<u>69</u> 53	60
		16	<u>J4</u> J1	← <u>85</u> 66	<u>38</u>
				TOTAL	162

Comments: Stands 13, 14, and 16 may be cut prior to 2019. This Block should be burned with a hot fire, preferably in July or August.

Management Unit 4. Y.O.E. --- 4

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1984	1	J5 J1	56 31	94
		2	J4 J1	56 34	85
		3	G		3
		4	J5	47	49
		5	J6	51	19
		6	J6	60	<u>27</u>
TOTAL					277

Comments: Cut, burn with a hot fire and regenerate to jack pine.

2	1994	7	J6	70	31
		8	J5	61	12
		9	J4J1	47	103
		10	J6	61	25
		11	J6	66	12
		12	J6	67	<u>9</u>
TOTAL					192

Comments: Cut, burn with a hot fire and regenerate to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2004	13	<u>J4</u> J1	54 ← <u>74</u> 46	163
		14	J5	51 ← 71	10
		15	J6	59 ← 79	<u>6</u>
TOTAL					179

Comments: Overstories may be removed as soon as possible. Following cutting in 2004, this Block must be burned and regenerated to jack pine.

*4	2014	16	J1	31	29
		17	<u>J5</u> J1	<u>56</u> ← <u>86</u> 61	16
			<u>J4</u> J1	56 ← <u>86</u> 64	76
		19	J1	31	32
		20	J6	49 ← 79	<u>11</u>
TOTAL					164

Comments: Overstories may be removed prior to 2014. It is suggested that these might be removed in 1983 when Block 1 is clearcut.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2024	21	J1	19 ← 59	82
		22	<u>J4</u> J1	<u>47</u> ← <u>87</u> 18 ← 58	<u>71</u>
TOTAL					153

Comments: Stand 21 is very open. Neither the J4 nor J1 components of Stand 22 is very dense either. Since cherry, a medium cover of grasses and sedges, and willow are tending to invade this site, this Block should be cut in 1984 or sooner, burned with a hot fire (preferably in July or August) and planted to jack pine.

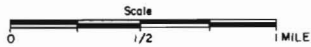
This immediate action would favor a site more suitable to Kirtland's Warblers, would provide habitable aged jack pine in the near future, and since the newly established stand would still be harvested in 2024 (at the age of approximately 40 years), no void would be created in habitat in the more distant future.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

SHARON AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

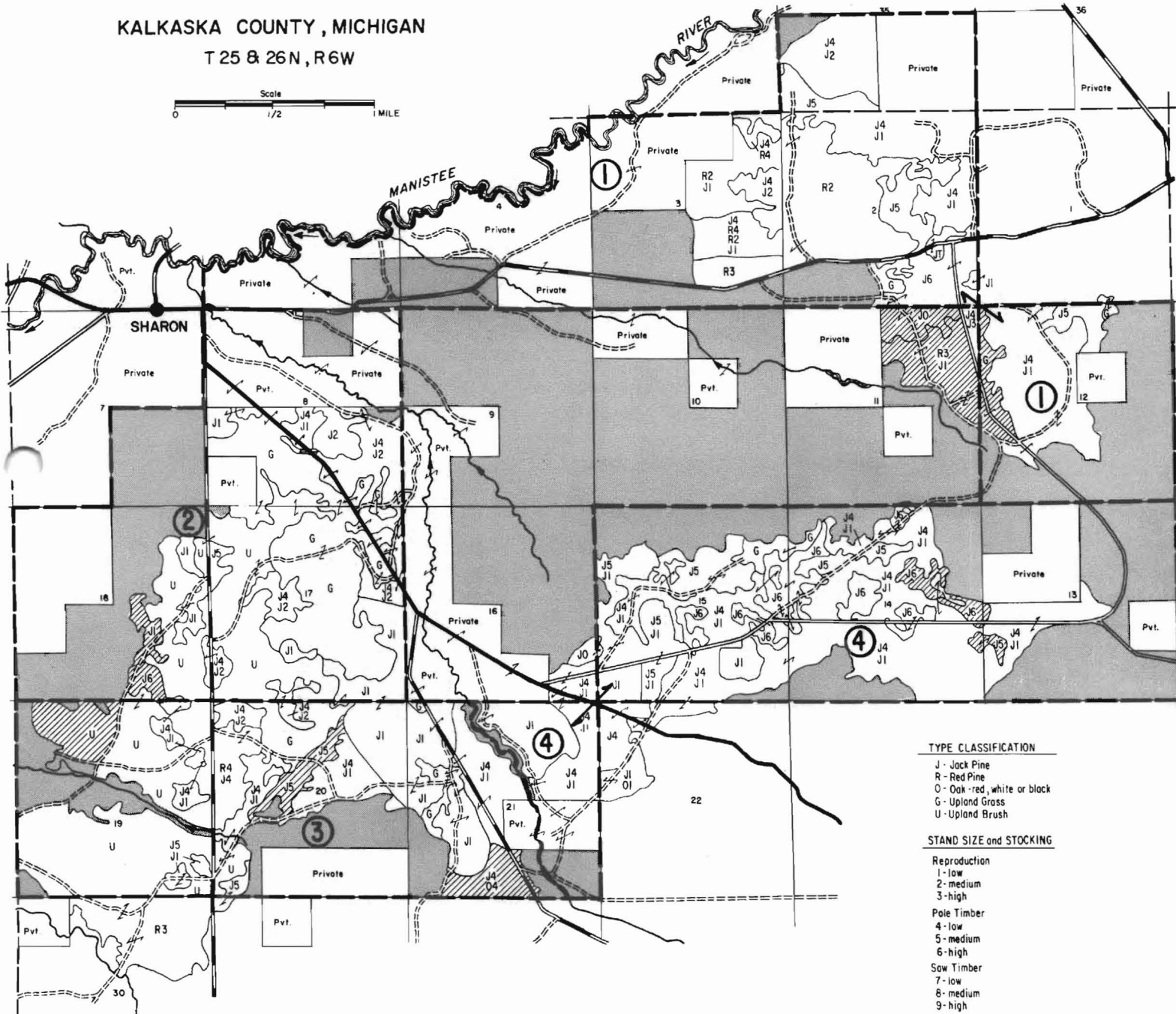
KALKASKA COUNTY, MICHIGAN
T 25 & 26 N, R 6 W



- NOT WARBLER HABITAT
- MARGINAL HABITAT
- COMPARTMENT BOUNDARY



SHARON AREA
KIRTLAND'S WARBLER
MANAGEMENT UNITS



TYPE CLASSIFICATION

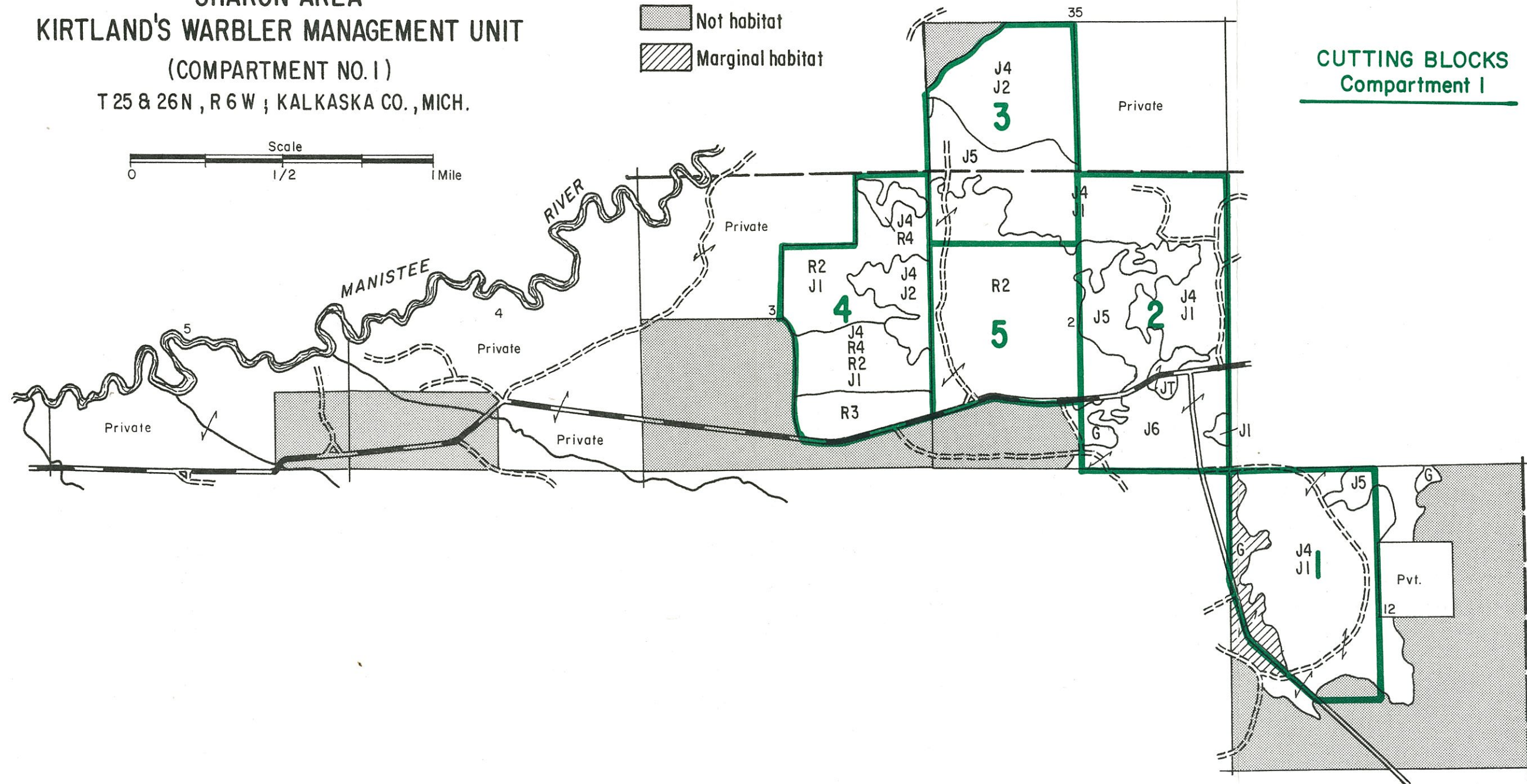
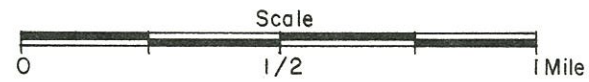
- J - Jack Pine
- R - Red Pine
- O - Oak - red, white or black
- G - Upland Grass
- U - Upland Brush

STAND SIZE and STOCKING

- Reproduction**
- 1 - low
- 2 - medium
- 3 - high
- Pole Timber**
- 4 - low
- 5 - medium
- 6 - high
- Saw Timber**
- 7 - low
- 8 - medium
- 9 - high

SHARON AREA
 KIRTLAND'S WARBLER MANAGEMENT UNIT
 (COMPARTMENT NO. 1)
 T 25 & 26 N , R 6 W ; KALKASKA CO. , MICH.

Not habitat
 Marginal habitat



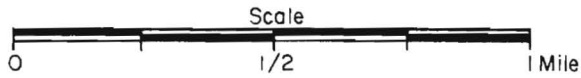
CUTTING BLOCKS
 Compartment I



SHARON AREA KIRTLAND'S WARBLER MANAGEMENT UNIT

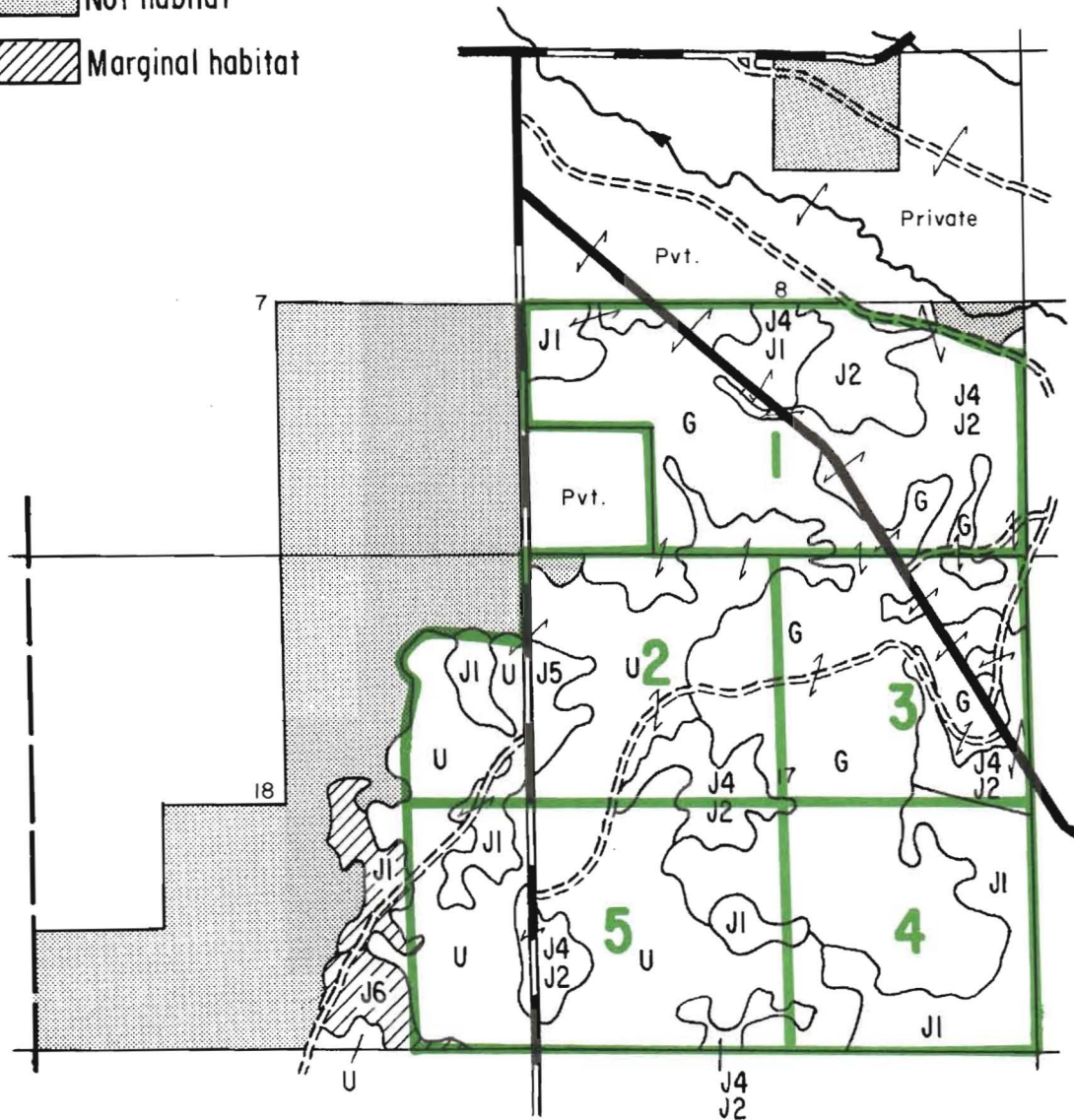
(COMPARTMENT NO.2)

T 25 N , R 6 W ; KALKASKA CO. ; MICH.

CUTTING BLOCKS
Compartment 2



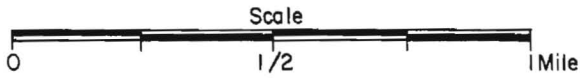
-  Not habitat
-  Marginal habitat



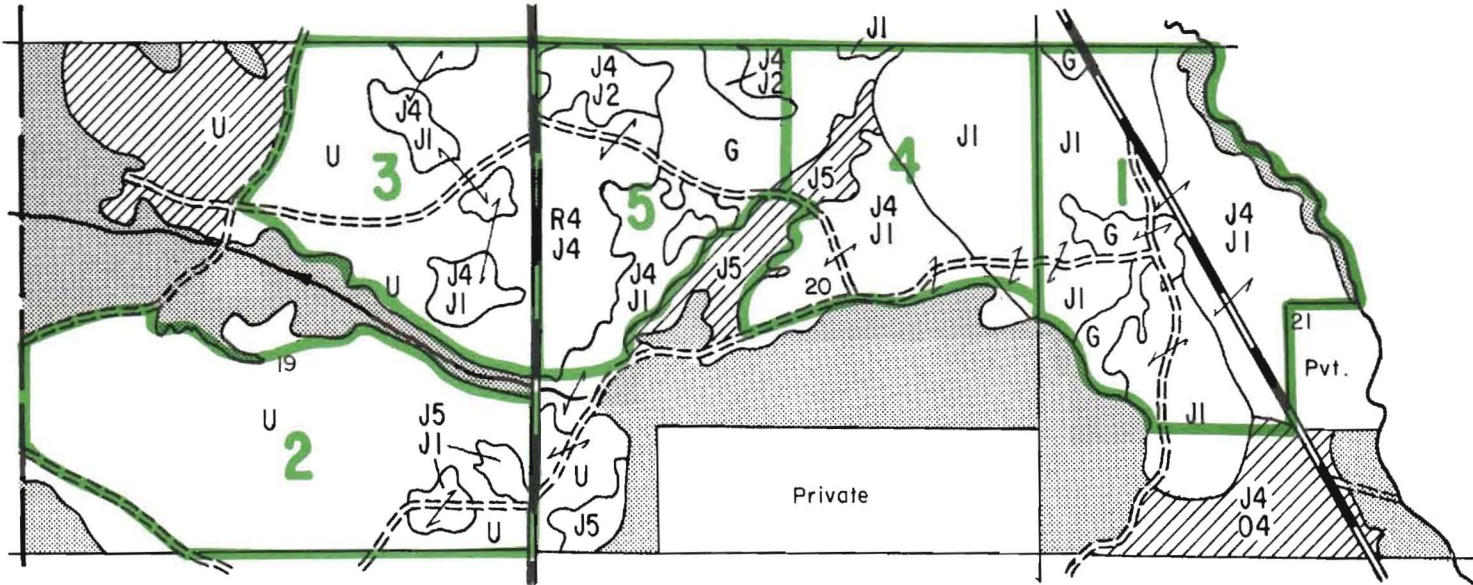
SHARON AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 3)

CUTTING BLOCKS
Compartment 3

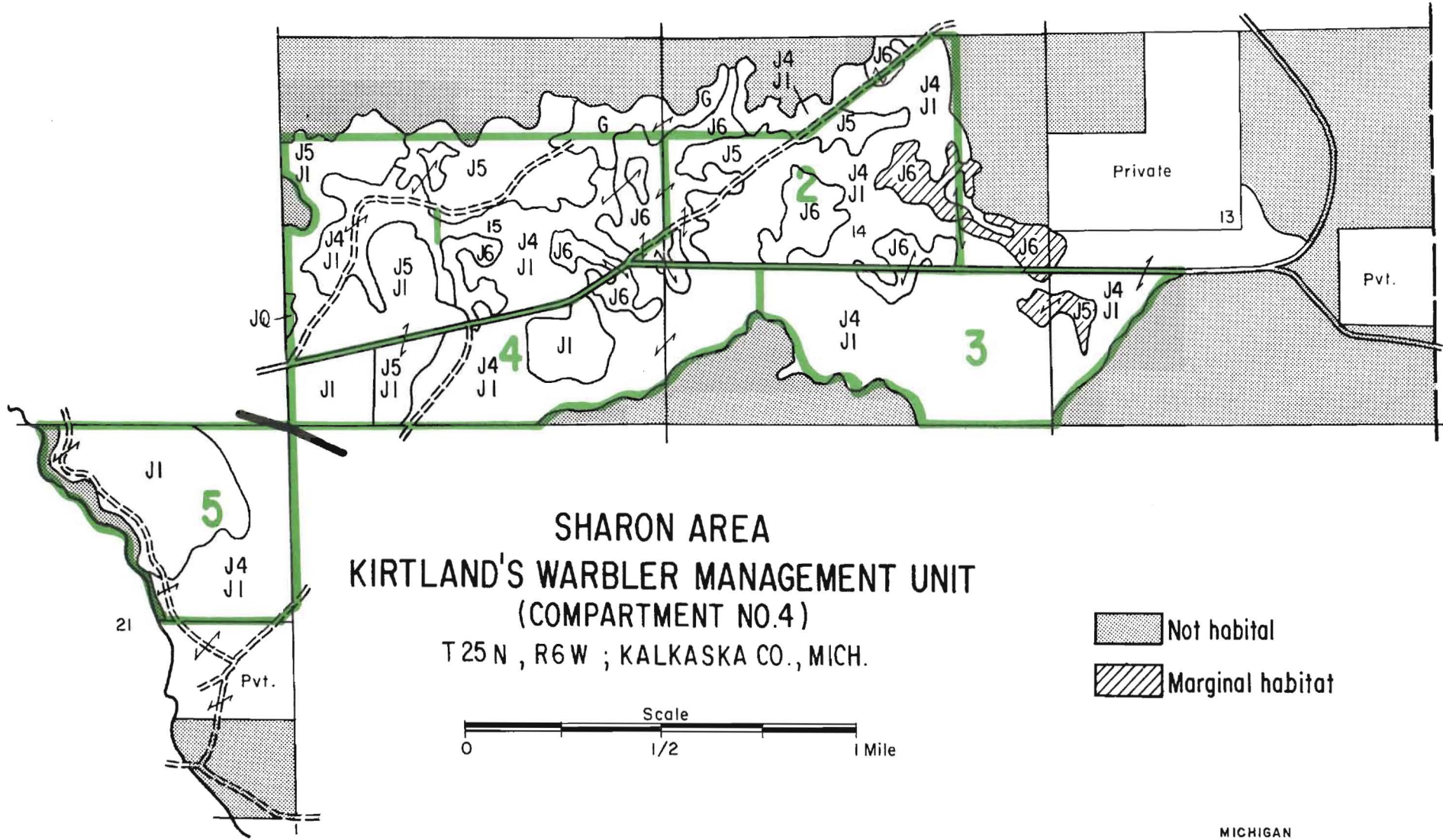
T 25 N , R 6 W ; KALKASKA CO. , MICH.



- Not habitat
- Marginal habitat



CUTTING BLOCKS
Compartment 4



SHARON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO.4)
 T 25 N , R6 W ; KALKASKA CO., MICH.

Not habitat
 Marginal habitat

CLEAR LAKE-TOMAHAWK CREEK KIRTLAND'S WARBLER MANAGEMENT AREA

Montmorency and Presque Isle Counties
T32N, R2E; T33N, R2E and T33N, R3E

Inventory Compartments:

Mackinac State Forest, Atlanta Area:	63 (Management Unit 1)
	64 (Management Unit 2)
	78 (Management Unit 3)
	62 (Management Unit 4)
	126 (Management Unit 5)
	124 (Management Unit 6)

Area Description

- A. General location and background information: The Clear Lake-Tomahawk Creek Kirtland's Warbler Management Area straddles the Montmorency-Presque Isle county line. It is located in north central Montmorency County and southwest Presque Isle County on a flat to moderately hilly expanse of Grayling sand. The Area is bounded by the more fertile sands.
- Management Units 1 through 4 are in Montmorency County while Units 5 and 6 are in Presque Isle County. Management Unit 6 has only one Cutting Block.
- B. Land ownership patterns: With only a few exceptions, this Management Unit is exclusively in state ownership. The private parcels desirable for acquisition are listed in the pertinent section of the Plan.
- C. Status of other resources: Outdoor recreation is an important use of both the land classified as critical habitat and the surrounding environment.

Clear Lake State Park is immediately to the south of Management Unit 3. A quarter mile buffer zone has been left around the periphery of the park to minimize effects of the park on warbler habitat and vice versa.

The High Country Pathway, a hiking trail receiving moderate use, passes through several Cutting Blocks in Management Units 1, 2, 3, and 4. This trail's location presents no immediate problems to nesting, however the trail cuts through the southeast corner of Cutting Block 1, Management Unit 2, and should therefore possibly be rerouted in the next eight years at this locality.

The Michigan Cross Country Cycle Trail runs through all the Cutting Blocks except Block 3 of Management Unit 1 and through Blocks 4 and 5 of Management Unit 5. The trail should be rerouted at least in Cutting Block 1 of Management Unit 1 prior to the Block attaining habitable-sized jack pine (in approximately eight years).

Considerable seismic testing has recently been done within the Clear Lake-Tomahawk Creek Management Area. Any hydrocarbon drilling activity proposed to in the Area should be carefully weighed prior to leases being granted.

M-33, a highway heavily traveled by locals, tourists and vacationers to the area, runs through the middle of the Management

Area. Clearcuts should be designed to consider the visual impact on these road users as well as the recreationists in the area.

- D. Kirtland's warbler occupancy history: Kirtland's warblers were first observed in this Area in the late 1940's in habitat which resulted from the large Canada Creek fire of 1939. The 1951 warbler census found 80 singing males using the young jack pine stands. During the 1961 census, 92 males were located. From 1961 to 1971 the population declined as the jack pine became too old for occupation. The 1971 census counted only one singing male. None has been found since.

CLEAR LAKE-TOMAHAWK CREEK AREA

Montmorency County

Presque Isle County

Management Unit 1. Y.O.E. --- 7

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1977	1	J2	32	39
		2	J1 (treatment in process)		15
		3	O1 (treatment in process)		95
		6	O4	40	74
		7	O4R4	41	13
		8	<u>J6</u> O1	<u>54</u>	50
		9	J1	17	32
		10	R2J2	29	3
		28	<u>J6</u> O1	<u>55</u>	<u>45</u>
					—
				TOTAL	366

Comments: Portions of this Cutting Block have been cut. These areas, together with the remainder of the Block, after it has been cut must be burned and planted to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*2	1987	34	J3	35	11
		33	<u>J4</u> <u>J2</u>	<u>54</u> <u>31</u>	45
		11	<u>J5</u> O1	<u>60</u>	24
		12	<u>J4</u> O1	<u>50</u>	41
		13	<u>J4</u> <u>J2</u>	<u>57</u> <u>21</u>	69
		14	J0	Already cut	160
		15	<u>J4</u> <u>J2</u>	<u>25</u>	22
		16	<u>J5</u> <u>J1</u>	<u>68</u>	97
		35	J3	42	<u>8</u>
				TOTAL	477

Comments: Regenerate the J0 stand as soon as possible. The remainder of the Block should not be cut and regenerated until 1987.

3	1997	17	J2R2	41	14
		19	J2	52	<u>271</u>
				TOTAL	285

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2007	25	J2	61	51
		20	R3	66	72
			J2	57	
		21	J2	51	11
		22	J3	65	244
		23	J0	29	<u>15</u>
TOTAL					393
*5	2017	18	R2J2	64	101
		24	R2J2	77	132
		26	<u>J5</u>	<u>88</u>	10
			01		
		27	J6	53 ← 93	31
		29	<u>J6</u>	53 ← 93	17
			01		
		30	J2	69	33
		31	J2	78	37
32	U2		<u>12</u>		
TOTAL					373

Comments: The J5 and J6 associations may be harvested as soon as possible if the area forester so wishes. Steps may need to be taken to prevent conversion to oak. The entire block will be treated with a commercial cut, must be seeded or planted to jack pine after cutting in 2017.

Management Unit 2. Y.O.E. --- 8

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1978	1	<u>J6</u> O1	<u>54</u>	51
		2	J3	34	67
		3	J504	51	36
		4	<u>O4</u> J2	<u>20</u>	40
		5	R3J2	<u>22</u> 31	86
		6	J2	30	<u>19</u>
TOTAL					299
2	1988	7	J3	42	19
		8	R3J2	41	27
		9	J2	41	<u>171</u>
TOTAL					217
3	1988	10	G		14
		11	J3	52	58
		12	R3J2	51	92
		13	J2	50	<u>15</u>
TOTAL					179

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2008	14	R3J2	61	26
		15	J2	61	<u>196</u>
TOTAL					222
*5	2018	18	J1	50	40
		16	J2	← 72	49
		17	R3J2	← 72	<u>90</u>
TOTAL					179

Comments: The JS stands may be cut prior to 2018. The block must be regenerated to jack pine in 2018.

Management Unit 3. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1979	1	J6	51	77
		2	J2	37	45
		3	J5	54	15
		4	J404	54	<u>27</u>
			TOTAL	164	
2	1989	5	J2	47	136
		6	J5	64	20
		7	J6	54	35
		8	J404	64	<u>4</u>
			TOTAL	195	
3	1999	9	J2	53	<u>240</u>
					TOTAL

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2009	10	J2	63	46
		11	J1	41	17
		12	<u>J4</u>	63	15
			J2		
		13	<u>J4</u>	53 ← <u>83</u>	27
J2	46				
14	<u>J4</u>	48 ← <u>78</u>	<u>80</u>		
J2	47				
TOTAL					185

Comments: The overstory of J4/J2 stands may be harvested prior to 2009.

*5	2019	16	J2	50	162
		17	<u>J4</u>	<u>86</u>	40
			J2	56	
18	J1	52	<u>45</u>		
TOTAL					247

Comments: Remove non-commercially, if necessary, the J4 from the J4/J2 stand.

Management Unit 4. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1983	1	J6	43	122
		2	G		17
		3	R4	43	<u>14</u>
				TOTAL	153

Comments: A hiking trail, the High Country Pathway, comes in contact with this Block at its southeastern corner.

2	1993	4	J6	53	153
		5	J1	32	33
		6	Bog		<u>6</u>
				TOTAL	192

Comments: The High Country Pathway presenting runs through Cutting Block 2.

3 2003

Comments: Management Unit 4 has no Cutting Block 3 due to the lack of availability of suitable potential habitat sites. Note, however, that Management Unit 6 in Presque Isle County has only a Cutting Block 3 and is scheduled to fill in the 2003 void.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2013	7	J1	56 ← 76	24
		8	J6	54 ← 74	95
		9	J6	53 ← 73	30
		10	R4	86	<u>43</u>
TOTAL					192

Comments: Harvest the jack pine prior to 2013 to prevent loss due to natural mortality. The entire Block (including those jack pine stands previously harvested and the red pine stand) must be regenerated to jack pine in 2013.

Note that presently the High Country Pathway runs through Cutting Block 4.

*5	2023	11	R2	67	115
		12	J6	53 ← 83	70
		13	J1	62	<u>20</u>
TOTAL					205

Comments: The mature jack pine in Stand 12 may be removed prior to 2023. The entire Block must be regenerated to jack pine in 2023.

Management Unit 5. Y.O.E. --- 5

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1985	1	J5	46	338
		2	G		<u>14</u>
					TOTAL
2	1995	3	J5	53	237
		4	J6	<u>53</u>	
			J2		<u>10</u>
			TOTAL	247	
3	2005	5	J6J2	63	39
		6	J5	63	144
		7	J3	40	22
		8	J1	40	8
		9	J6J2	65	<u>4</u>
					TOTAL

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2015	10	J4J2	← 74	209
		11	J404J2	← 72	14
		12	O2J1	52	27
		13	J1	44	28
		14	R3	62	25
		15	R201	62	<u>17</u>
		TOTAL			

Comments: Mature jack pine may be removed from Stands 10 and 11 prior to 2015. The entire Block must be regenerated in 2015, however.

*5	2025	16	A2	72	2
		17	R201	72	29
		18	R3	72	164
		19	<u>J2</u> <u>R2</u>	← <u>83</u> <u>60</u>	41
		20	J2	← 84	11
		21	J1	47	<u>26</u>
		TOTAL			

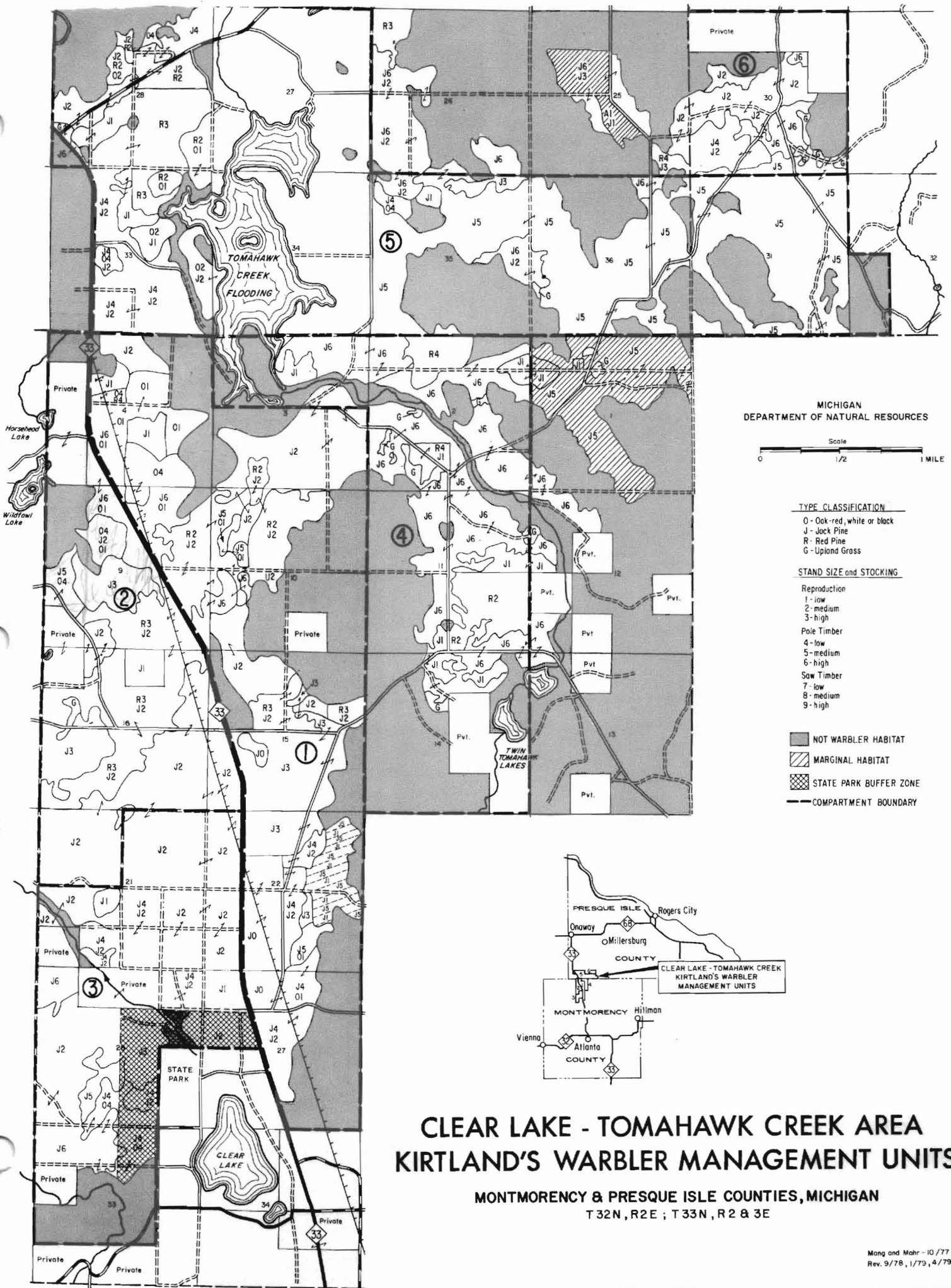
Comments: Stand 16 and parts of Stands 20 and 21 contain aspen. This aspen should be controlled by using an acceptable silvicide such as Tordon or Amdon prior to cutting.

Mature jack pine in Stands 19 and 20 should be cut prior to 2025. The entire Block, however, must be regenerated in 2025.

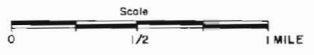
Management Unit 6. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
(Only a Cutting Block 3 exists in this Management Unit.)					
3	2003	1	J5	64	39
		2	G		9
		3	J6	63	48
		4	J2	38	116
			<u>J4</u>	<u>61</u>	
		5	J2	35	78
		6	J2	61	4
		7	J6	64	<u>5</u>
				TOTAL	299

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.



MICHIGAN
DEPARTMENT OF NATURAL RESOURCES



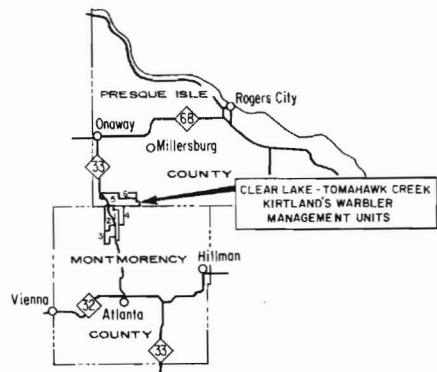
TYPE CLASSIFICATION

- O - Oak-red, white or black
- J - Jack Pine
- R - Red Pine
- G - Upland Grass

STAND SIZE and STOCKING

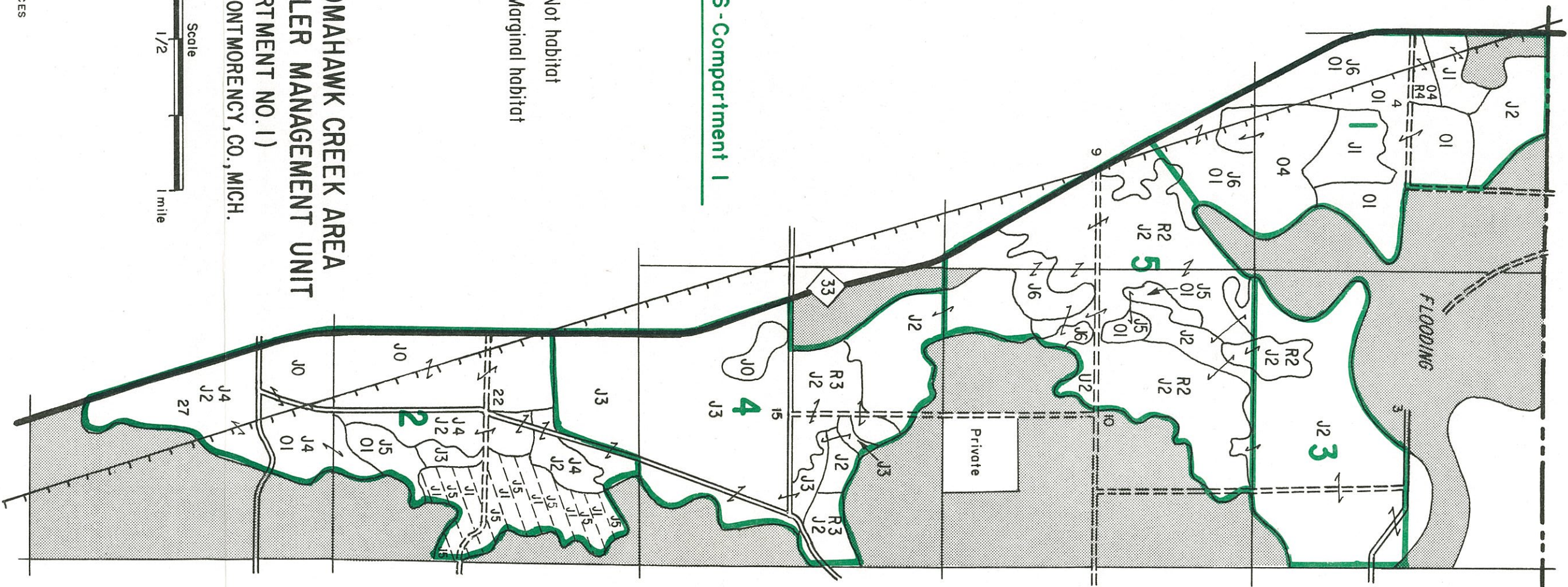
- Reproduction
- 1 - low
 - 2 - medium
 - 3 - high
- Pole Timber
- 4 - low
 - 5 - medium
 - 6 - high
- Saw Timber
- 7 - low
 - 8 - medium
 - 9 - high

- NOT WARBLER HABITAT
- MARGINAL HABITAT
- STATE PARK BUFFER ZONE
- COMPARTMENT BOUNDARY



CLEAR LAKE - TOMAHAWK CREEK AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

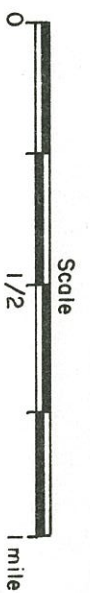
MONTMORENCY & PRESQUE ISLE COUNTIES, MICHIGAN
T 32N, R2E ; T 33N, R2 & 3E



CUTTING BLOCKS - Compartment 1

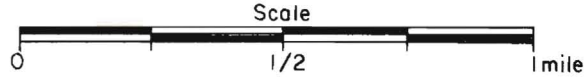
**CLEAR LAKE - TOMAHAWK CREEK AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 1)**



T 32N, R 2E ; MONTMORENCY, CO., MICH.

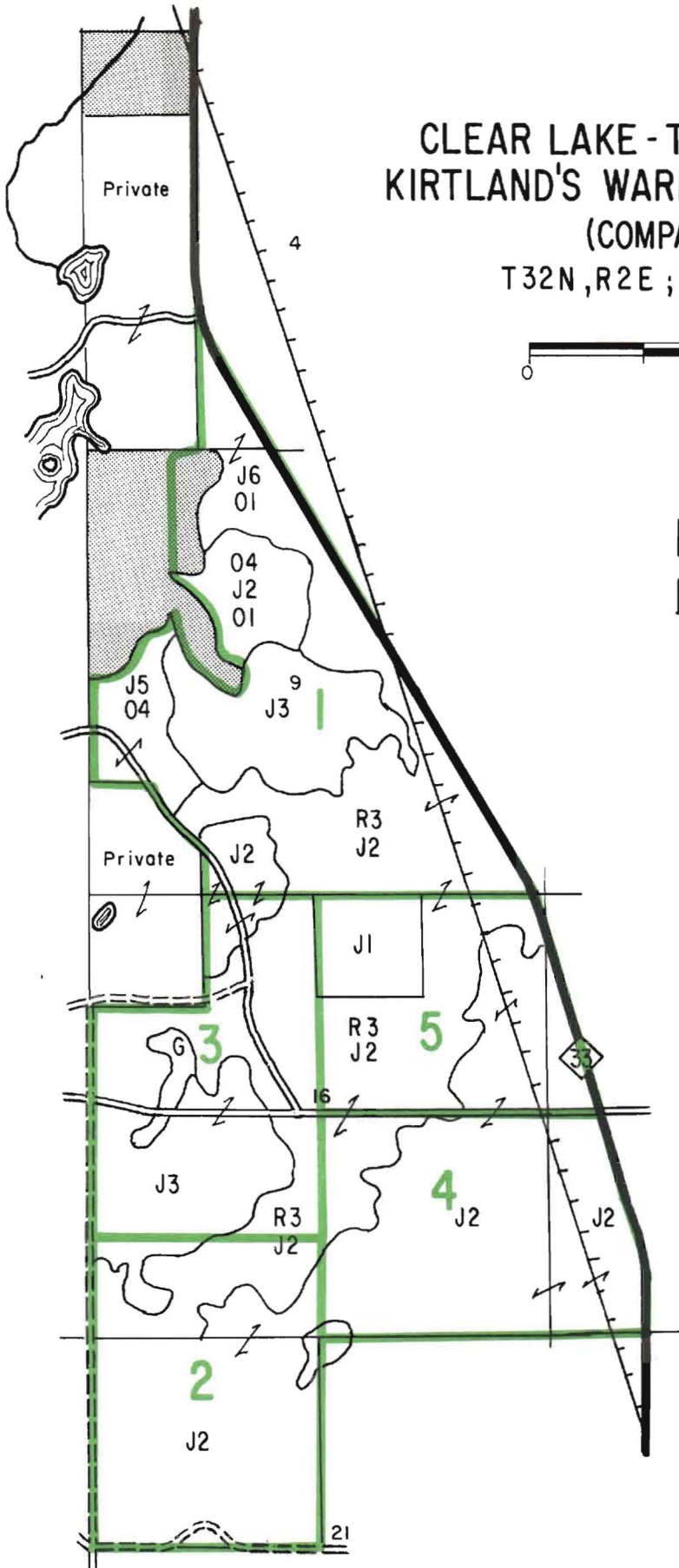


CUTTING BLOCKS - Compartment 2

CLEAR LAKE - TOMAHAWK CREEK AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 2)
T 32N, R 2E ; MONTMORENCY, CO., MICH.

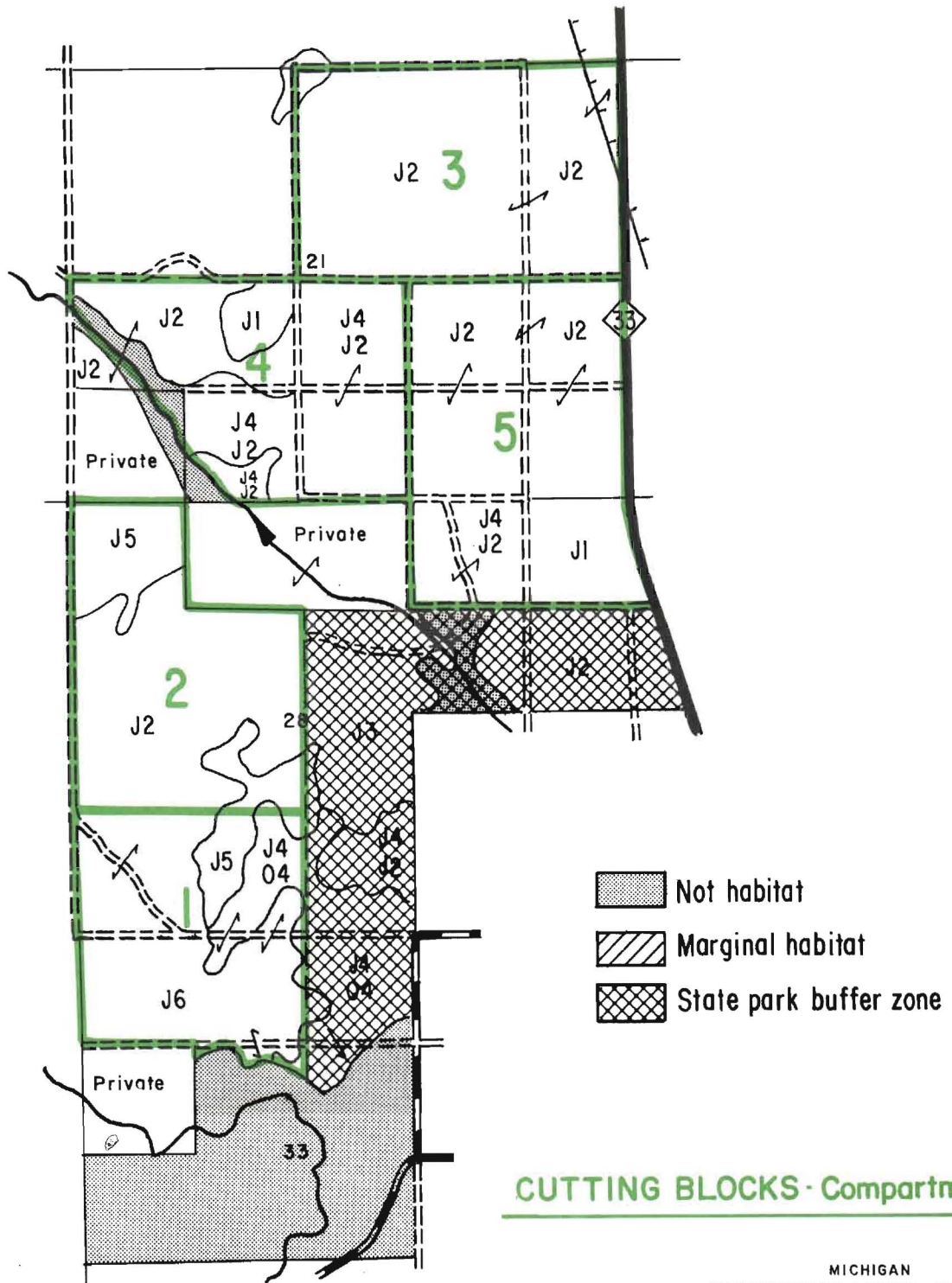
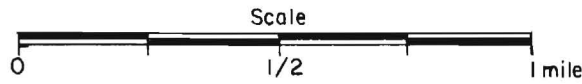


-  Not habitat
-  Marginal habitat



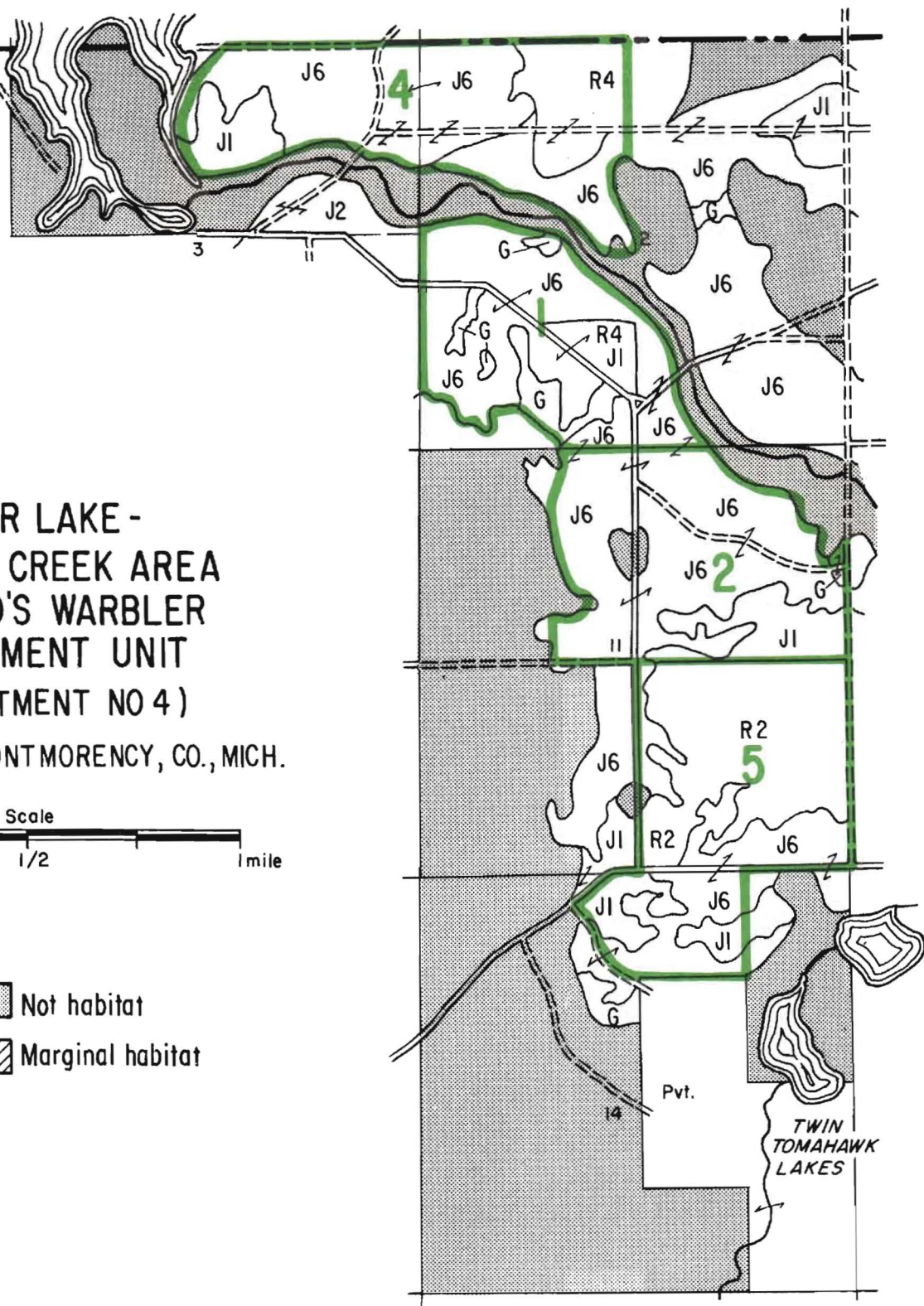
CLEAR LAKE - TOMAHAWK CREEK AREA KIRTLAND'S WARBLER MANAGEMENT UNIT (COMPARTMENT NO. 3)

T 32 N , R 2 E ; MONTMORENCY, CO., MICH.



CUTTING BLOCKS - Compartment 3



TOMAHAWK CREEK FLOODING



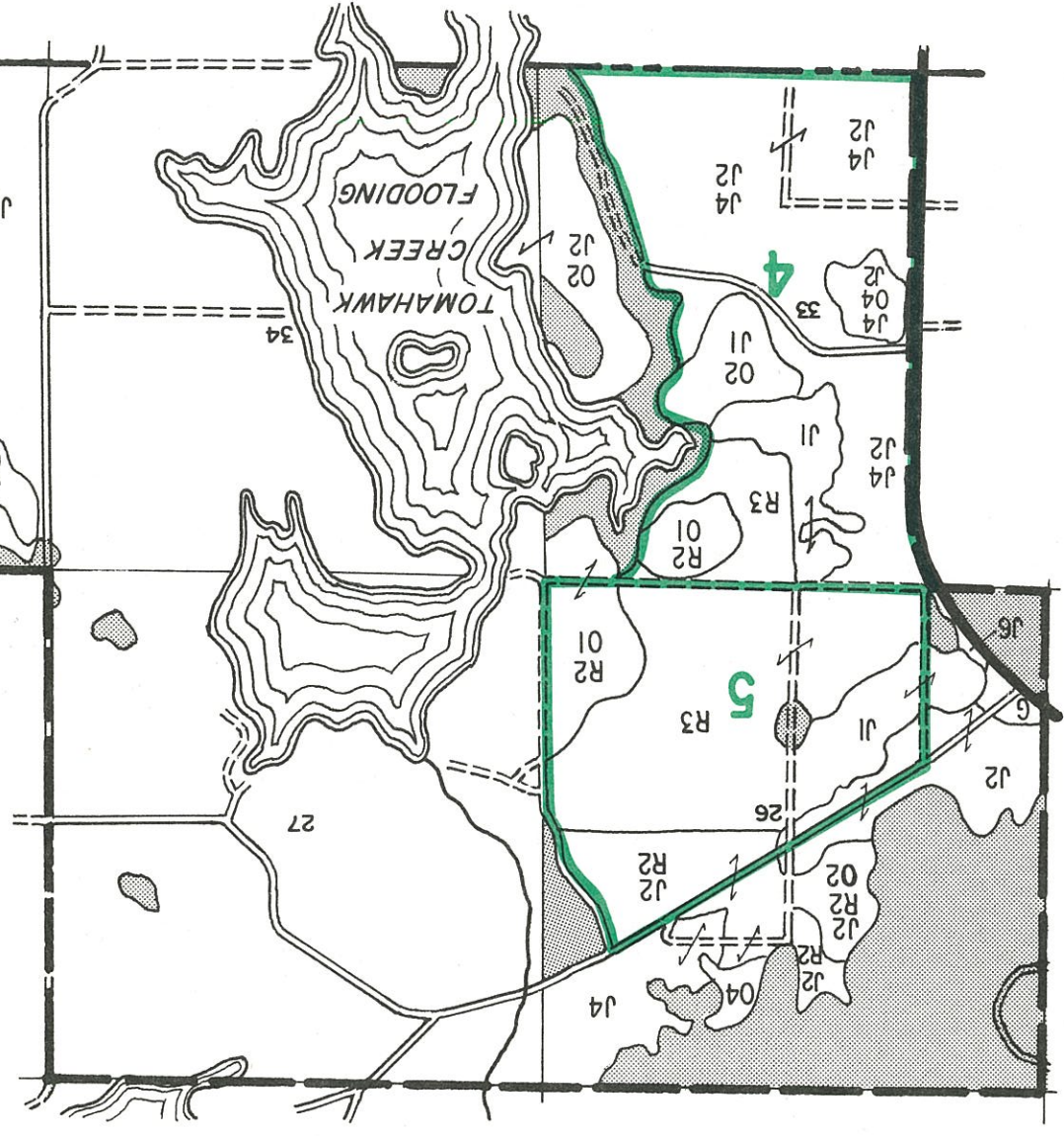
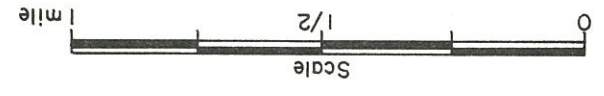
CLEAR LAKE -
TOMAHAWK CREEK AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO 4)

T 32 N, R 2 E ; MONT MORENCY, CO., MICH.



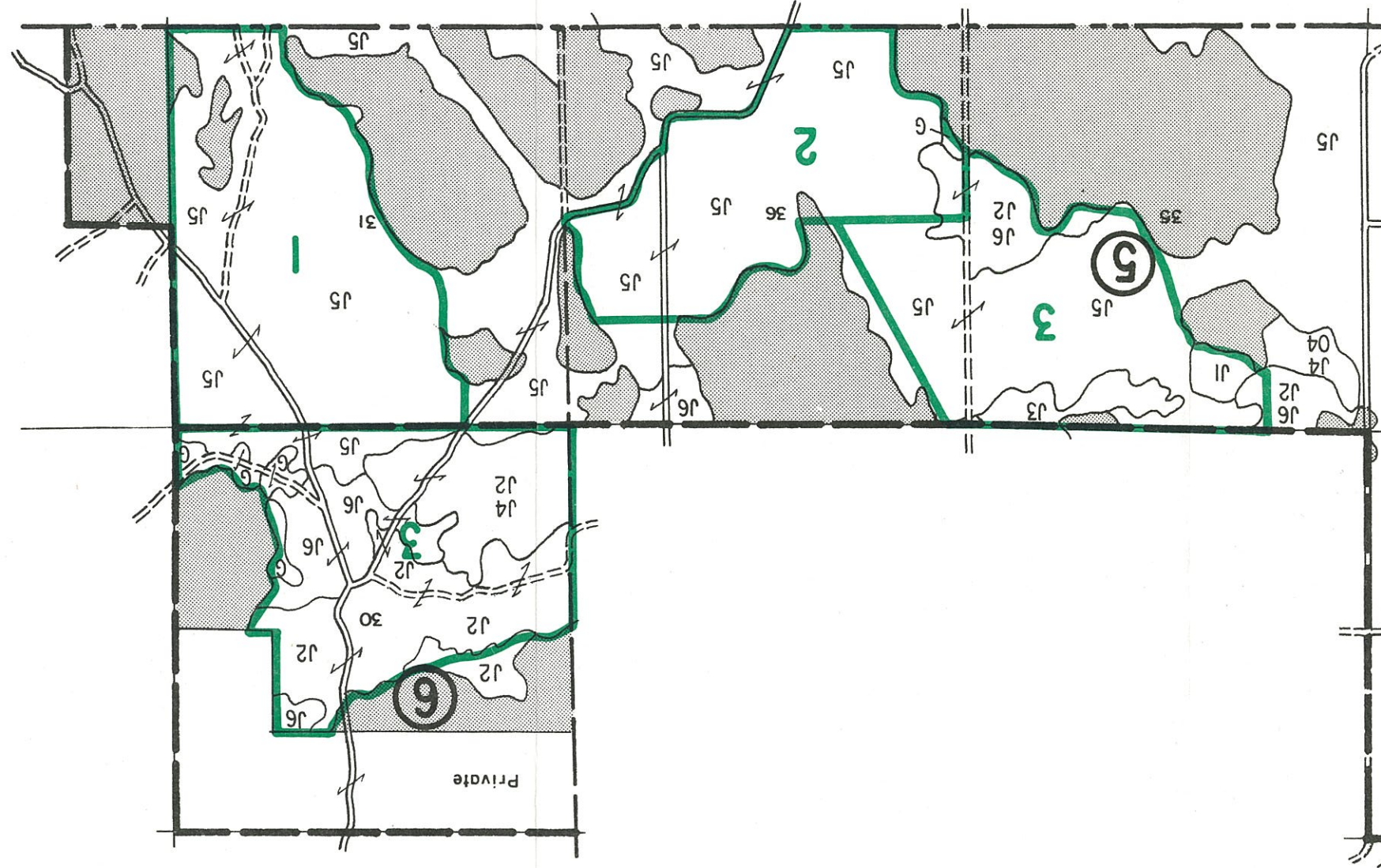
-  Not habitat
-  Marginal habitat

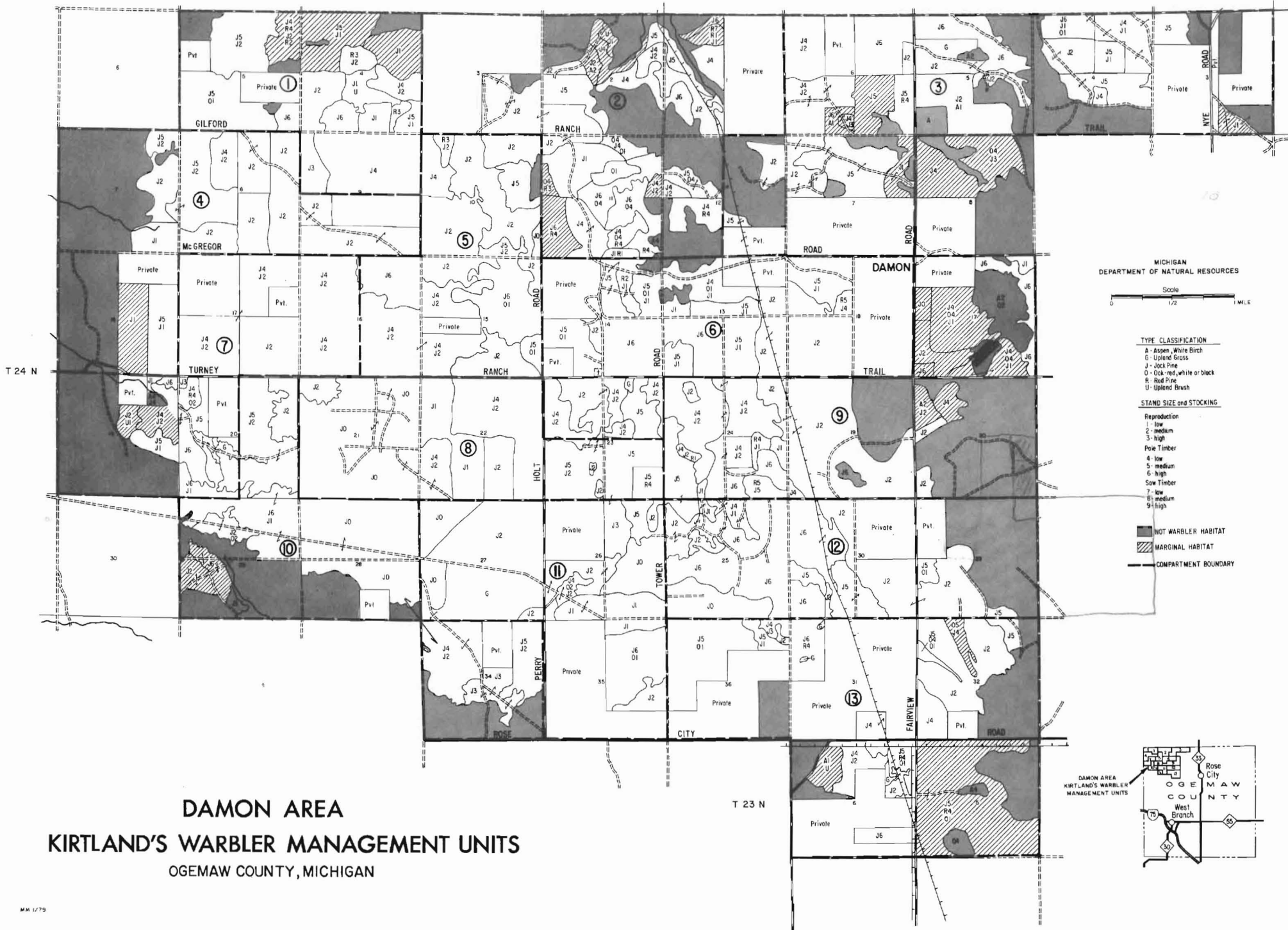
CLEAR LAKE - TOMAHAWK CREEK AREA
 KIRTLAND'S WARBLER MANAGEMENT UNIT
 (COMPARTMENTS NO. 5 & 6)
 T 33N, R 28 3E; PRESQUE ISLE CO, MICH.



- Not habitat
- Marginal habitat
- Compartment boundary

CUTTING BLOCKS-Compartment 5,6





MICHIGAN
DEPARTMENT OF NATURAL RESOURCES

Scale
0 1/2 1 MILE

TYPE CLASSIFICATION

- A - Aspen, White Birch
- G - Upland Grass
- J - Jack Pine
- O - Oak, red, white or black
- R - Red Pine
- U - Upland Brush

STAND SIZE and STOCKING

Reproduction

- 1 - low
- 2 - medium
- 3 - high

Pole Timber

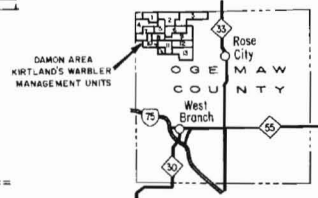
- 4 - low
- 5 - medium
- 6 - high

Saw Timber

- 7 - low
- 8 - medium
- 9 - high

■ NOT WARBLER HABITAT
 ▨ MARGINAL HABITAT
 - - - COMPARTMENT BOUNDARY

DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNITS
 OGEMAW COUNTY, MICHIGAN



DAMON KIRTLAND'S WARBLER MANAGEMENT AREA

Ogemaw County
T23N R2E, T24N R2E and T24N R1E

Inventory Compartments:

Au Sable State Forest, Mio Area:	29	(Management Unit 1)
	30	(Management Unit 2)
	31	(Management Unit 3)
	32	(Management Unit 4)
	33	(Management Unit 5)
	34	(Management Unit 6)
	35	(Management Unit 7)
	36	(Management Unit 8)
	37	(Management Unit 9)
	38	(Management Unit 10)
	39	(Management Unit 11)
	40	(Management Unit 12)
	41	(Management Unit 13)

Area Description

- A. General location and background information: The Damon Kirtland's Warbler Management Area is the largest of the sixteen Management Areas. It consists of thirteen Management Units, each with the full complement of five Cutting Blocks. It is located in the northwest quarter of Ogemaw County on an extensive area of Grayling sand.
- B. Land ownership patterns: Parts of the Area are blocked in well in state ownership. However, throughout most of the Area private parcels (usually in tracts of 160 acres and less) impede Kirtland's Warbler habitat management. Most of these tracts provide excellent potential for warbler use. Unfortunately, some of the parcels contain permanent or vacation homes and/or 'have been subdivided.
- C. Status of other resources: Of major importance is the oil extraction which takes place over much of the Damon Kirtland's Warbler Management Area. There exist many oil wells and, of notable significance, many above ground oil and gas pipelines. Consideration of these facilities, along with occasional storage tanks, must be made when designing prescribed burns.

Furthermore, private property values must be recognized when management prescriptions are being written.

The Area receives moderately heavy off-road vehicle use. This use will need to be limited to established roads, at least in occupied Blocks, to prevent detrimental effects on warbler nesting.

Moderate blueberry picking and hunting also take place in the Area.

Damon Road and Rose City Road run along the south and east sides of the Area. These are relatively high-use roads so visual impressions should direct management adjacent to these thoroughfares.

- D. Kirtland's warbler occupancy history: Although the earliest records do not indicate warbler occupation in this Area until the mid to late 1950's, portions of this large Area undoubtedly held warblers prior to this time. About a quarter of the total known population has been located in this Area since the 1961 census, but the occupied sites have largely changed from the 1946 Sawdust or Horseshoe Lake Burn and original "Ogemaw Management Area" to the 1966 Damon Burn area.

DAMON AREA

Ogemaw County

Management Unit 1. Y.O.E. --- 0

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1980	1	J5 01	65	198
		2	J6	70	31
		4	J5 J2	50 17	5
TOTAL					234

Comments: The A2 stand is not part of the Cutting Block.

2	1990	5	J4	58	265
		6	J3	26	55
TOTAL					320
*3	2000	7	J2	35	97
		8	J1U	32	20
		11	J6	53 ← 73	49
		10	J5 J1	51 ← 71 42	123
		12	A4		5
		9	R3J2	46	26
TOTAL					320

Comments: Scattered aspen clones are present in the north half of the Cutting Block. Steps should be taken to prevent its spread. The J6 stand and the J5 overstory should be removed in 1980. The entire Block must be regenerated in 2000. Burn this Block hot.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2010	14	$\frac{J5}{J2}$	50 ← $\frac{80}{47}$	160
		13	J4R4	74 ← 106	<u>53</u>
TOTAL					213

Comments: Thin the jack pine out of the J4R4 stand prior to 2010. Remove the J5 component of the J5J2 stand as soon as possible to provide possible warbler habitat from the understory and to prevent loss of the timber.

*5	2020	15	R3J2	66	20
		16	J1	46	94
		17	J1U	52	30
		18	$\frac{J4}{J2}$	51 ← $\frac{81}{61}$	60
		19	J1	51	46
		20	R3	64	16
		21	$\frac{J5}{J1}$	54 ← $\frac{94}{57}$	23
		22	$\frac{J5}{J1}$	51 ← $\frac{91}{62}$	<u>17</u>
TOTAL					306

Comments: Overstories in the J4J2 and J5J1 stands may be removed prior to the 2020 year of entry. In 2020, harvest and burn this Block hot to control conversion to brush.

Management Unit 2. Y.O.E. --- 2

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1982	1	J4	52	39
		2	J604	66	26
		3	J604	56	64
		4	J404R4	49	30
		5	J1	7	<u>17</u>
TOTAL					176

Comments: Parts of this Cutting Block may have only marginal potential for habitat. Aspen, Cherry, and willow are invading cut-over areas. After cutting, the entire Block must be burned with a hot fire. In places, a silvicide may be necessary to control the aspen.

*2	1992	6	J604	66 ← 76	25		
		7	J604	56 ← 66	18		
		8	O1	16	17		
		9	J1	39	11		
		10	<u>O4J4</u>	59 ← 69	25		
			O1				
		12	<u>J4</u>	<u>27</u>	29		
			J2				
		13	J504	54 ← 64	43		
		14	J4R4	63	<u>46</u>		
		TOTAL					214

Comments: Overstory may be removed from many stands as soon as possible to prevent loss of overmature trees. The jack pine is out-competing the red pine in the J4R4 stand.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2002	15	J4	54 ← 74	45
		16	J5	53 ← 73	49
		17	J6	67 ← 87	29
		19	J2	38	93
		18	J6	52 ← 72	13
		20	J4	58 ← 78	41
		21	<u>R7</u> R1J1	<u>40</u>	<u>37</u>
TOTAL					307

Comments: To avoid timber loss due to over-maturity, many of the stands may be cut prior to 2002. However, the entire Block must be burned and regenerated to jack pine in 2002.

*4	2012	22	J4	52 ← 82	54
		23	J6R4	52 ← 82	73
		24	J1	59	86
		25	O1	22	5
		26	<u>O4</u> R3	<u>54</u>	15
		27	J6O4	66 ← 96	11
		28	J2	45	<u>22</u>
		TOTAL			

Comments: This Block must be burned following cutting in 2012 since some stands in this Block have a tendency to produce heavier groundcover than is suitable for Kirtland's warblers. The jack pine should be removed from the J4 and O4R3 stands to prevent loss. Also, it may be desirable to thin the J6R4 plantation. The entire Block must be burned and regenerated to jack pine in 2012.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2022	29	J2	55	220
		30	J5	← 104	<u>80</u>
				TOTAL	300

Comments: The J5 stand is overmature. It should be cut as soon as possible.

Management Unit 3. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1983	1	J6	58	147
		2	A2	7	21
		3	G		49
		4	J2	18	7
		5	J2	25	<u>40</u>
TOTAL					264

Comments: The spread of aspen should be stemmed in this Block, possibly by using an acceptable silvicide such as Tordon. This Block must be burned hot following cutting.

2	1993	6	J6	64	144
		7	J2	31	15
		8	J5	64	50
		9	J5R4	61	<u>31</u>
TOTAL					240

Comments: If desired, the jack pine may be removed from the J5R4 stand and the red pine may be held for a longer period. The remainder of the Block (209 ac.) should be burned and must be regenerated to jack pine in 1993.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2003	10	J4J3	54	12
		11	<u>J6</u> A1	← 70	25
		12	<u>J4</u> J2	35	115
		13	<u>J4</u> J2	43	<u>98</u>
				TOTAL	250

Comments: The J6/A1 stand is marginal with scattered aspen clones. The J6 should be harvested prior to 2003, and, if possible, the aspen should be contained.

*4	2013	17	<u>J6</u> J101	60 ← <u>93</u> 52	70
		18	J2	37	53
		19	<u>J5</u>	60 ← <u>93</u>	78
		20	J4	65	13
		21	<u>J5</u> J1	60 ← <u>93</u> 52	40
		22	<u>J4</u> J1	49 ← <u>82</u> 55	120
		23	J5	44 ← 77	<u>40</u>
				TOTAL	414

Comments: The overstories of the stands in this Block are presently mature. These should be removed as soon as possible. This Block must be burned hot following the 2013 cut to improve the warbler habitat potential. Burn in later summer.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2023	15	J2	57	99
		16	J5	← 97	<u>193</u>
				TOTAL	292

Comments: The J5 Stand is currently mature and should be cut as soon as possible. Do not cut the aspen within this stand. The aspen should be treated with Tordon or some other similar acceptable silvicide.

Management Unit 4. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*1	1979	1	J4	47 → 52	120
		2	J2	15 → 20	40
		3	J2	5	<u>160</u>
TOTAL					320

Comments: This Block should be burned following cutting. Do not burn the 5-year old J2. Treat for residual of this stand. The 15-year old J2 has provided habitat for warblers in 1977 and 1978. Cutting must be deferred in the Block until this habitat is no longer suitable.

2	1989	4	<u>J5</u> J1	<u>67</u>	120
		5	J1	18	<u>120</u>
TOTAL					240

Comments: The entire Block must be burned since undesirable white pine, cherry, and sand willow are invading.

*3	1999	6	<u>J5</u> J2	57 ← <u>77</u>	104
		7	<u>J4</u> J2	59 ← <u>79</u> 36	73
		8	J2	37	<u>39</u>
TOTAL					216

Comments: The overstories should be removed as soon as possible to possibly open up the understories to Kirtland's warblers and to prevent a loss in the timber resource. The J2 has scattered overstory which may be noncommercial.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2009	9	J2	47	26
		10	J5 J2	57 ← 87	103
		11	J1	37	65
		12	J2	← 45	69
				TOTAL	263

Comments: The overstories should be removed as soon as possible to possibly open up the understories to Kirtland's warblers and to prevent a loss in the timber resource. The J2 stands have scattered overstories which may be noncommercial.

5	2019	13	J2	65	80
		14	J2	53	160
		15	J2	45	80
				TOTAL	320

Management Unit 5. Y.O.E. --- 1

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1981	1	J6	54	115
		2	<u>J4</u> J2	<u>52</u> 28	<u>205</u>
		TOTAL			
2	1991	3	<u>J4</u> J2	<u>62</u> 38	81
		4	<u>J6</u> 01	61	145
		5	J2	33	70
		6	J2	24	<u>24</u>
		TOTAL			
*3	2001	7	<u>J4</u> J2	← <u>72</u> 48	96
		8	J2	38	110
		9	<u>J5</u> 01	← <u>79</u>	30
		10	<u>J6</u> 01	← <u>71</u>	<u>44</u>
TOTAL				280	

Comments: Warblers are currently using this Block. As soon as the habitat is no longer used by warblers, the overstory may be removed.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2011	11	J2	47	166
		12	$\overline{J2}$	← 47	107
		13	$\frac{J5}{J2}$	52 ← $\frac{82}{43}$	24
		14	J0	33	11
		15	J5	52 ← 82	<u>12</u>
				TOTAL	320

Comments: Remove overstories as soon as possible in the indicated stands. the /J2 stand has some residual jack pine which may also be removed prior to 2011.

*5	2021	16	$\overline{J2}$	← 57	73
		17	J2	57	5
		18	J4	49 ← 89	71
		19	R3J2	59	18
		20	J2	54	64
		21	J5	52 ← 92	
				TOTAL	273

Comments: The J4 and J5 stands should be cut as soon as possible to prevent loss of the timber resource. The /J2 stand should have the scattered jack pine overstory removed also to possibly provide habitat in the understory stand.

Management Unit 6. Y.O.E. --- 2

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1982	1	J6	60	160
		2	G		5
		3	<u>J4</u> J2	<u>37</u> 24	34
		4	J5	52	62
		5	J2	18	15
		6	<u>J4</u> J2	<u>55</u>	17
		7	<u>J4</u> J2	<u>51</u> 23	<u>27</u>
TOTAL					320
2	1992	8	J6	65	120
		9	<u>J5</u> J1	<u>41</u>	40
		10	<u>J5</u> J1	<u>62</u>	108
		11	J2	26	30
		12	<u>J4</u> J101	<u>64</u> 29	<u>26</u>
		TOTAL			

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2002	13	<u>J4</u> J101	64 ← <u>74</u> 39	75
		14	<u>J5</u> J1	62 ← <u>72</u>	14
		15	<u>O4</u> W1		15
		16	J1	35	24
		17	<u>J5</u> J101	61 ← <u>71</u> 45	49
		18	R2J1	45	25
		19	J5	58 ← 68	<u>62</u>
TOTAL					264

Comments: Remove overstory from indicated stands. It is suggested the overstory be removed when Block 2 is harvested. This entire Block must be burned following cutting to prevent brush and heavy grass from increasing. Also note that oil wells, an oil holding tank and above ground pipeline exist in the Cutting Block. The O4/W1 stand should be managed with the remainder of the Block to provide a single height class of young trees.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2012	20	J2	63	19
		21	<u>J5</u> 01	60 ← 90	97
		22	J2	48	62
		23	<u>J4</u> J2	<u>50</u>	96
		24	<u>J5</u> J2	<u>83</u> 54	<u>6</u>
TOTAL					280

Comments: The overstory in the J5/01 should be cut prior to 2012. It is suggested that it be cut at the same time that Cutting Block 1 is cut.

Note: There exists an old cemetery in the SE corner of SE 1/4 of SW 1/4 of Sec. 14. Originally 4 acres were set aside for this cemetery. Do not manage this 4 acres for warblers. Graves are marked by small white wooden stakes.

*5	2022	25	J2	56	287
		26	<u>J5</u> J1	56 ← <u>91</u> 54	115
		27	R5J4	55 ← 90	<u>19</u>
TOTAL					421

Comments: Warblers are currently using this Cutting Block. Wait approximately ten years, then remove the overstory in the J5/J1 stand and clearcut or thin the R5 J4 stand. The entire Block will be cut and regenerated in 2022.

Management Unit 7. Y.O.E. --- 4

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1984	1	<u>J4</u> J2	<u>55</u> 31	160
		2	J3	24	5
		3	J4R402	56	28
		4	J5	46	<u>7</u>
				TOTAL	200

Comments: This Block must be burned following cutting.

*2	1994	5	<u>J4</u> J2	52 ← <u>65</u> 41	<u>160</u>
				TOTAL	160

Comments: It is suggested that the overstory may be removed in 1981 when Management Unit 5, Cutting Block 1, is cut.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2004	6	J6	66	81
		7	$\frac{J6}{J1}$	55 ← $\frac{75}{49}$	69
		8	G		13
		9	$\frac{J5}{J2}$	48 ← $\frac{68}{49}$	37
		10	J6	68	9
		11	J1	37	7
		13	$\frac{J4}{J2}$	46 ← $\frac{66}{49}$	72
		14	J2U1	39	25
		15	$\frac{J5}{J1}$	64	<u>28</u>
TOTAL					341

Comments: Overstory of indicated stands may be removed when Block 1 is cut. In 2004, the entire Block must be burned and regenerated to jack pine.

*4	2014	16	$\frac{J4}{J2}$	52 ← $\frac{85}{61}$	<u>240</u>
TOTAL					240

Comments: Remove the J4 overstory prior to 2014. It is suggested that it be removed in 1981 when Management Unit 5, Cutting Block 1, is cut.

*5	2024	17	$\frac{J4}{J2}$	52 ← $\frac{92}{71}$	40
		18	J2	59	<u>160</u>
TOTAL					200

Comments: Remove J4 overstory in 1981 when Management Unit 5, Cutting Block 1, is cut.

Management Unit 8. Y.O.E. --- 7

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreege</u>
1	1977	1	J0	Treatment in process	<u>320</u>
TOTAL					320

Comments: Burn and regenerate to jack pine.

2	1987	2	$\frac{J5}{J2}$	$\frac{58}{29}$	147
		3	J2	24	13
		4	J5	56	120
		5	J5R4	60	<u>40</u>
		TOTAL			

Comments: The J5R4, except for a possible harvest of the jack pine, is not to be cut in 1987. This stand will be final cut and regenerated to jack pine with Management Unit 11, Cutting Block 3, in 1996.

*3	1997	6	$\frac{J4}{J2}$	$\frac{35}{27}$	80
		7	J2	27	80
		8	J1	27	80
		9	$\frac{J4}{J2}$	$\frac{37}{27}$	<u>80</u>
TOTAL					320

Comments: The biologist may wish to remove the overstory in the J4/J2 stand.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2007	10	J4 J2	45	240
		11	J1	37	<u>80</u>
					TOTAL
5	2017	12	J0	40	279
		13	J2	56	<u>41</u>
					TOTAL

Management Unit 9. Y.O.E. --- 1

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1981	1	J0		20
		2	<u>J404</u> J1	<u>59</u> 39	137
		3	J2	19	66
		4	J6	51	<u>17</u>
TOTAL					234

Comments: This entire Block must be burned with a hot fire following cutting.

2	1991	5	<u>J4</u> J2	<u>60</u> 32	165
		6	J5	66	78
		7	<u>J4</u> J2R1	<u> </u> 26	11
		8	J2	38	13
		9	J1	20	9
		10	<u>J4</u> J2	<u>64</u> 43	<u>44</u>
TOTAL					320

Comments: Due to heavier groundcover, this Block must be burned hot following cutting.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2001	11	J4 J2	54 ← <u>74</u> 53	33
		12	J6	← 74	66
		13	J5R5	← 72	34
		14	<u>R4</u> J1	64	12
		15	J1	34	15
		16	J4	64	8
		17	J2	34	<u>42</u>
TOTAL					210

Comments: The overstory of the J4/J2 stand as well s the J6R4 and the J5R4 stands may be cut prior to 2001. The entire Block, however, must be cut and regenerated in 2001.

4	2011	18	<u>J4</u> J2	<u>42</u>	100
		19	J2	44	<u>220</u>
TOTAL					320
*5	2021	20	J2	54	227
		21	J6	← 91	<u>16</u>
TOTAL					243

Comments: The J6 stand is overmature and falling over. If no harm will caused to the habitat this should be cut as soon as possible. The Area Forester and Habitat Biologist are left to decide how the J6 stand should be managed.

Management Unit 10. Y.O.E. --- 5

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1975	1	J0	Treatment in process	<u>196</u>
TOTAL					196
2	1985	2	<u>J6</u> J1	<u>56</u>	211
		3	<u>J5</u> J2	<u>49</u> 30	55
		4	J202	23	<u>43</u>
TOTAL					309

Comments: As per agreement between the Area Forester and the Habitat Biologist on 9/28/78, the J202 will be inspected prior to treatment for possible exclusion from critical habitat.

*3	1995	5	<u>J4</u> J2	<u>43</u> 43	184
		6	J3	46	71
		7	<u>J5</u> J2	← <u>68</u> 39	<u>101</u>
TOTAL					356

Comments: The east half of this Block is marginal with medium to heavy grass, willow, cherry, and raspberry in the understory. Therefore, it must be burned hot following cutting. Possibly remove indicated J5 overstory prior to 1995.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2005	8	J5 J2	← 69 50	166
		9	J2	43	63
		10	G		<u>11</u>
TOTAL					240

Comments: Possibly remove indicated overstory prior to 2005.

5	2015	11	J0	40	<u>260</u>
TOTAL					260

Comments: Seed or plant in 1979. Harvest cut in 2015.

Management Unit 11. Y.O.E. --- 6

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1976	1	G	Treatment in process	213
		2	J0	Treatment in process	37
		3	J2	13 63	<u>13</u>
TOTAL					263

Comments: Stand 3 need not be treated until 2026.

2	1986	4	<u>J6</u> O1	<u>58</u>	174
		5	J1	9	21
		6	J2	16	<u>45</u>
TOTAL					240

Comments: The J1 stand is a result of a wildfire and may not need to be treated with the remainder of the Block in 1986.

*3	1996	7	J3	44	56
		8	J5	48	49
		9	J2	43	14
		10	J0		<u>41</u>
TOTAL					160

Comments: The J0 stand has just been cut. It should be treated with Block 5 of this Management Unit. The J5R4 stand of Management Unit 8, Cutting Block 2, is to be regenerated with this Block. Block 3 will be treated in its entirety for the second rotation in 2046.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2006	11	J2	49	278
		12	J0	30	<u>95</u>
					TOTAL
*5	2016	13	J2	63	85
		14	<u>J4</u>	46 < <u>84</u>	23
			J2	63	
		15	J0	35	83
		16	J1	39	<u>129</u>
			TOTAL	320	

Comments: The J0 stand of this Block and the J0 stand of Block 3 are to be burned and regenerated to jack pine in 1979.

Management Unit 12. Y.O.E. --- 8

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1978	2	J0	In process of treatment	135
		1	J6	53	<u>105</u>
				TOTAL	240

Comments: Note that oil wells and pipelines are in the Block.

2	1988	3	J6	63	131
		5	J2	23	20
		6	<u>J2</u>	<u>33</u>	54
		7	J5	58	21
		8	J1	37	11
		4	<u>J4</u>	<u>65</u>	<u>39</u>
			J1	25	
				TOTAL	276

Comments: Note that oil wells and pipelines are in the Block.

*3	1998	9	J6	← 73	44
		10	J6	← 68	106
		11	J2	31	<u>54</u>
				TOTAL	204

Comments: Note that oil wells and pipelines are in the Block. It may be desirable for timber purposes to cut the J6 stands prior to 1998. However, the entire Block must be regenerated in 1998.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2008	12	J5	← 80	36
		13	J2	41	239
		14	<u>J5</u> O1	← 79	<u>21</u>
TOTAL					296

Comments: Note that oil wells and pipelines are in the Block. Also the J5 and J5/O1 stands could be cut sooner than 2008. The entire Block must be regenerated in 2008, however.

*5	2018	19	J6	48 ← 88	29
			J2	51	3
		17	J5	50 ← 90	50
		18	J5	47 ← 87	24
		20	J2	22 ← 62	9
		16	J6	60 ← 100	110
		15	J0	Treatment in process	<u>16</u>
TOTAL					240

Comments: This Block should be cut with Cutting Block 1 in 1978. It should then be burned and regenerated to jack pine. It will again be cut, possibly burned, and regenerated to jack pine in 2018. Oil wells and pipelines exist in the Cutting Block.

Management Unit 13. Y.O.E. --- 0

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1980	1	<u>J5</u> 01	<u>53</u>	230
		2	<u>J5</u> J1	<u>42</u>	26
		3	<u>J4</u> J3	<u>42</u> <u>24</u>	16
		4	J2	32	8
		5	J6R4	54	<u>80</u>
TOTAL					360
2	1990	6	<u>J5R4</u> 01	<u>58</u>	158
		7	G		16
		8	J2	32	<u>10</u>
TOTAL					184
<u>Comments:</u> This Block must be burned.					
3	2000	9	J4	60	62
		10	J2	33	<u>129</u>
TOTAL					191

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2010	11	J2	43	144
		12	05J4	← 76	25
		13	<u>J504</u> 01	← <u>82</u>	13
		14	J5	← 80	<u>22</u>
				TOTAL	204

Comments: The older stands may be cut prior to 2010. The 05J4 stand is marginal, having aspen clones. Also in this stand is an oil well and facility. Treatment of this stand should be based on the judgment of the Area Forester, Area Fire Supervisor, and Habitat Biologist.

*5	2020	15	<u>J5R4</u> 01	<u>88</u>	254
		16	04		<u>26</u>
				TOTAL	280

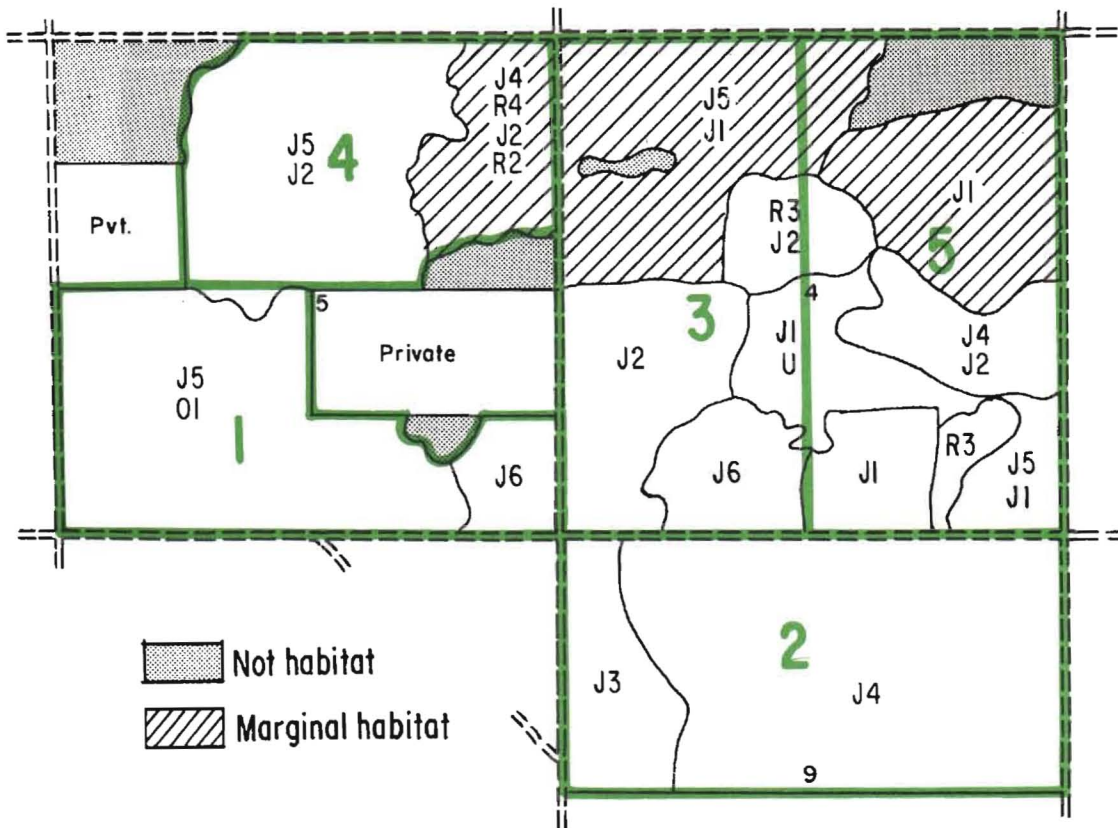
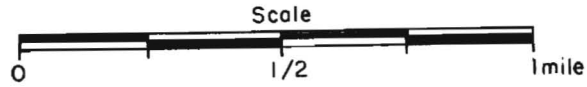
Comments: The jack pine should be removed from the J5R4/01 stand prior to 2020. This Block must be burned.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

CUTTING BLOCKS-Compartment I

DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 1)

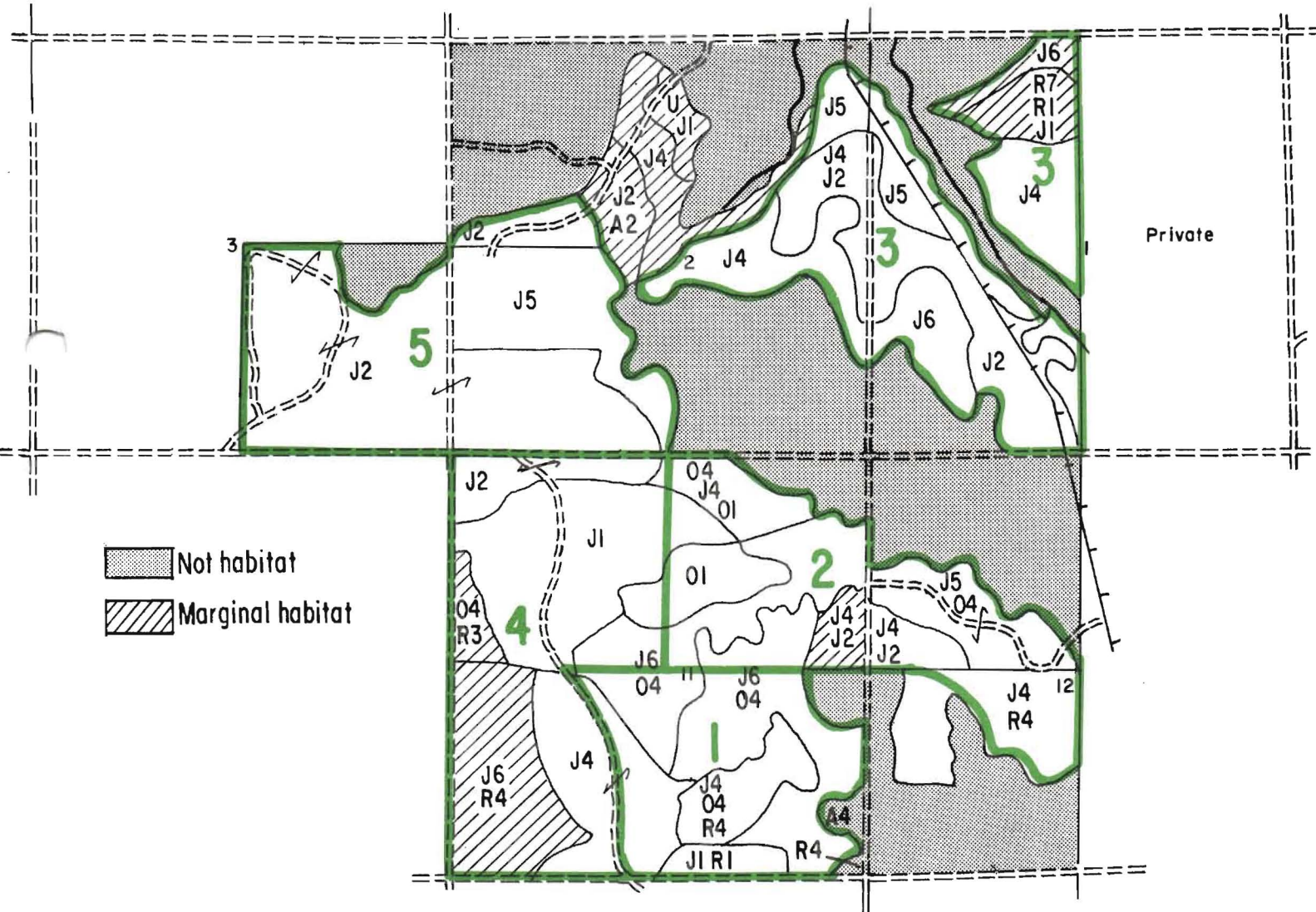
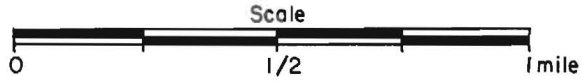
T 24 N , R 1 E ; OGEMAW CO., MICH.



CUTTING BLOCKS - Compartment 2

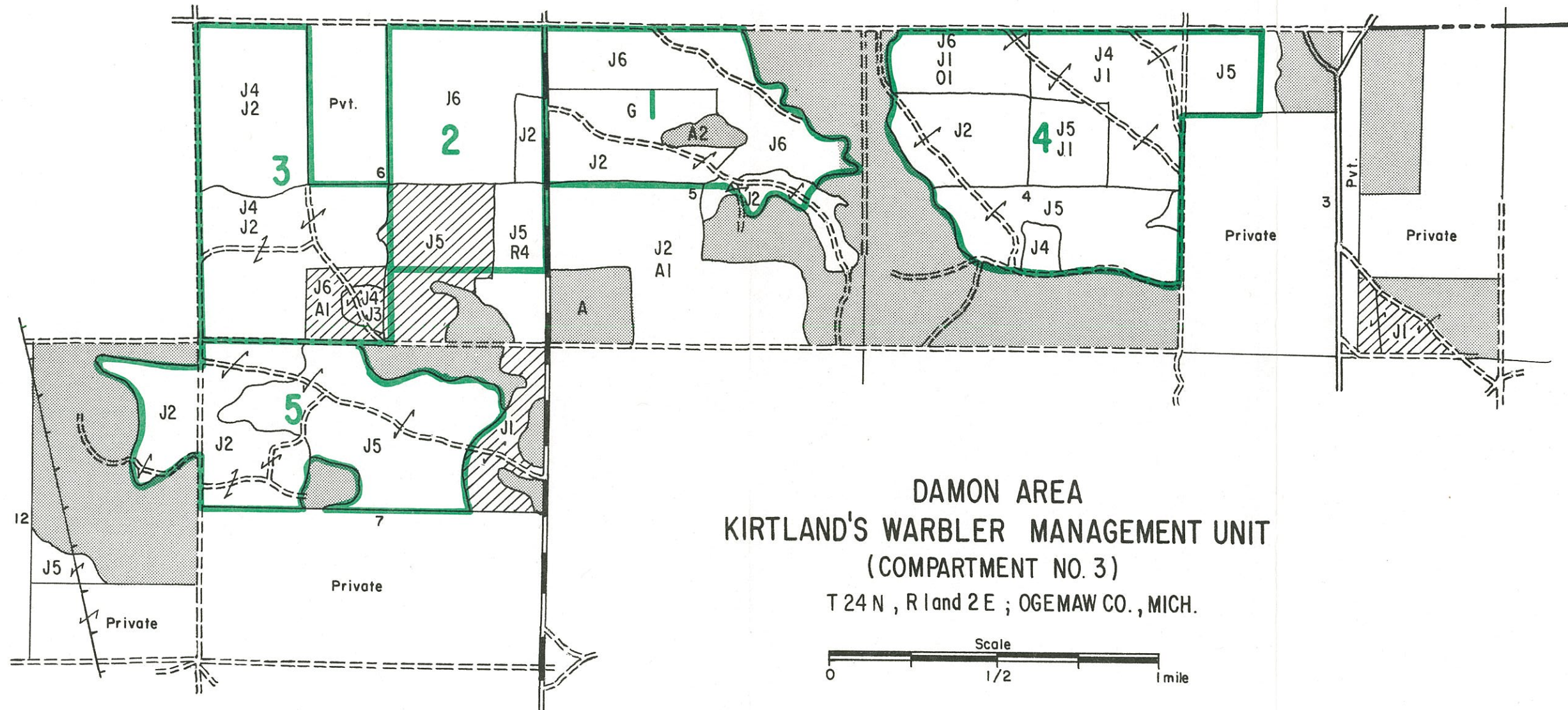
DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 2)

T 24N , R1E ; OGE MAW CO., MICH.



Not habitat
Marginal habitat

CUTTING BLOCKS-Compartment 3



Not habitat
 Marginal habitat

CUTTING BLOCKS-Compartment 4

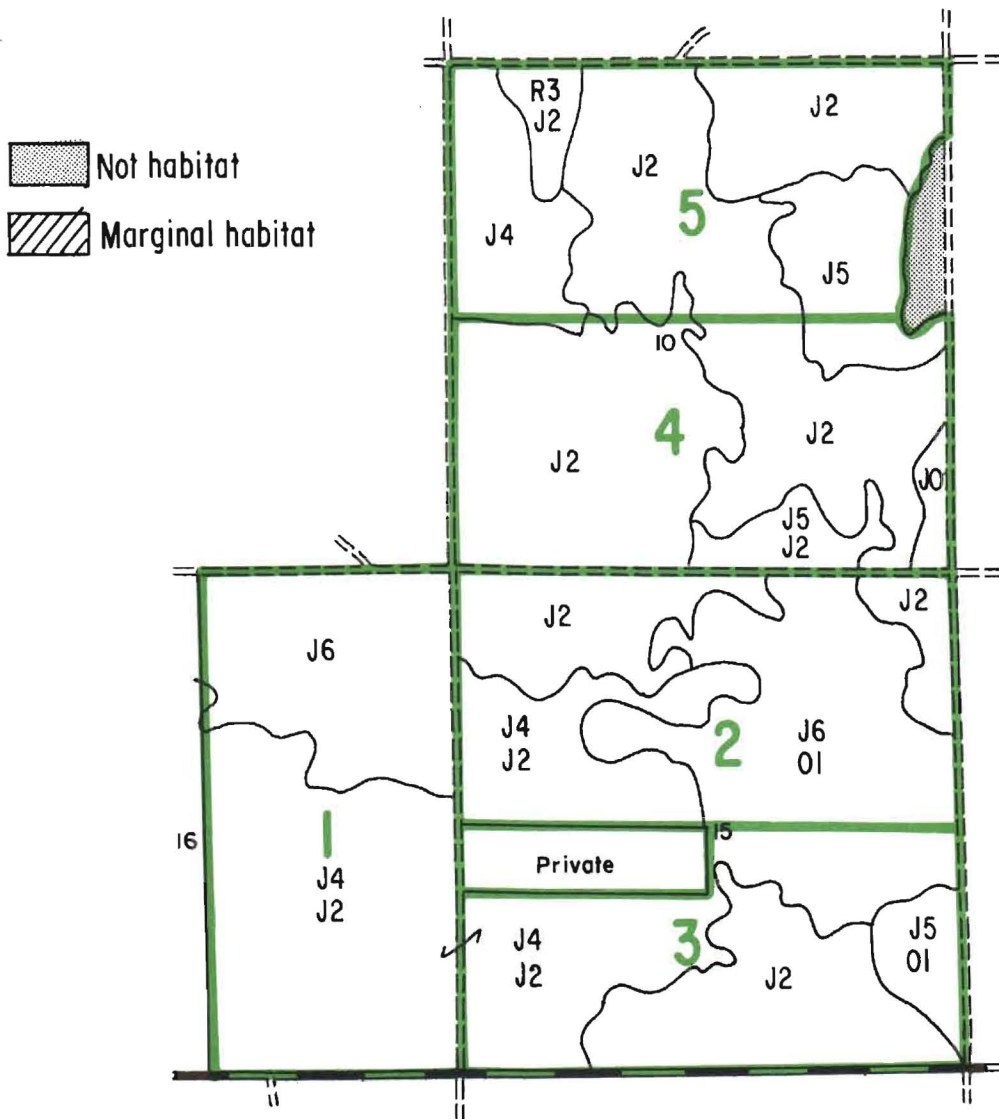
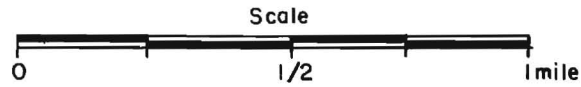
DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 4)

T 24N, R 1E ; OGEMAW CO., MICH.



DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 5)

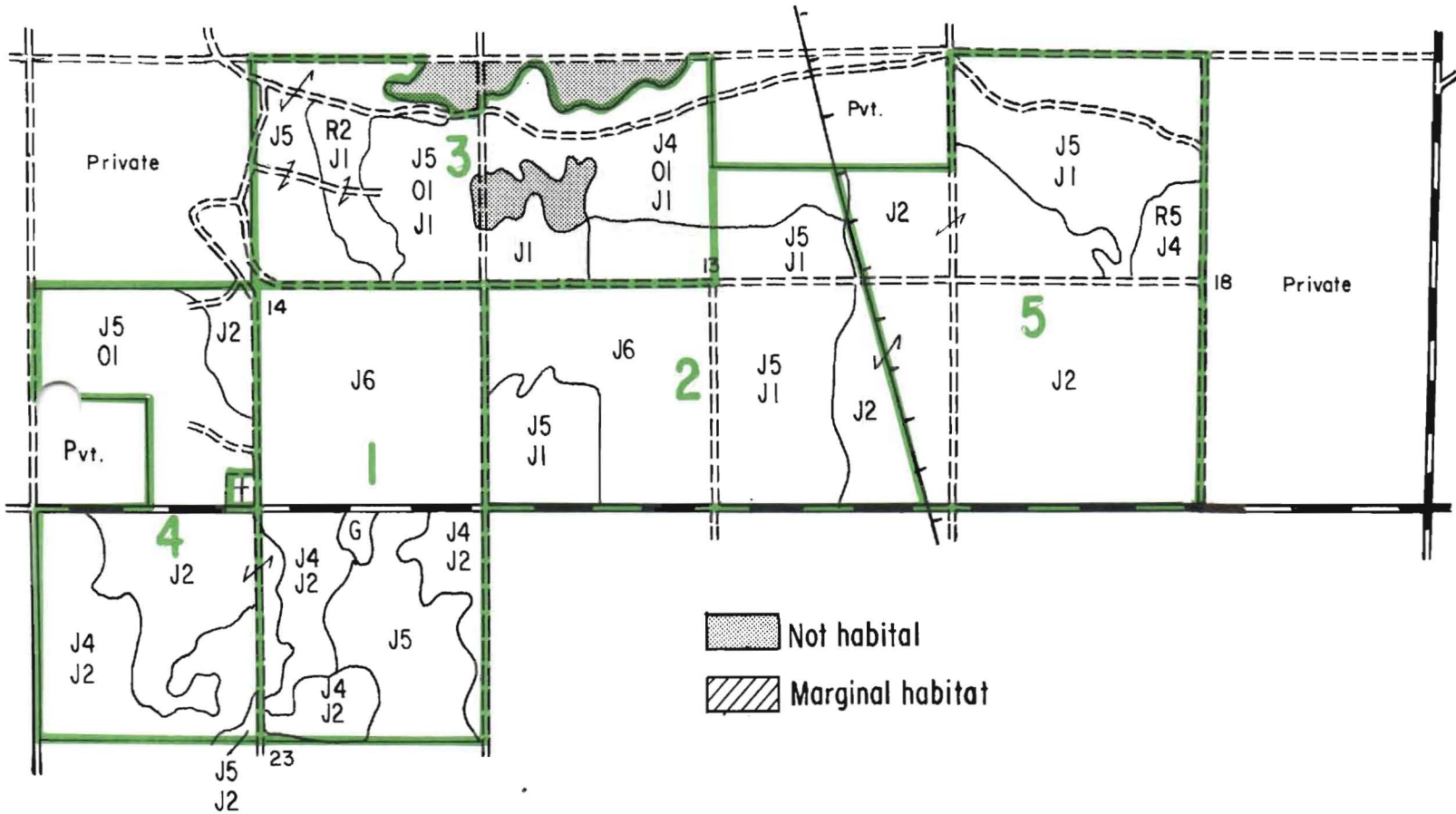
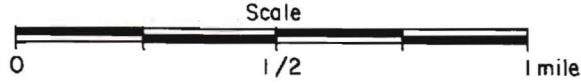
T24N, R1E, OGEMAW CO., MICH.



CUTTING BLOCKS-Compartment 6

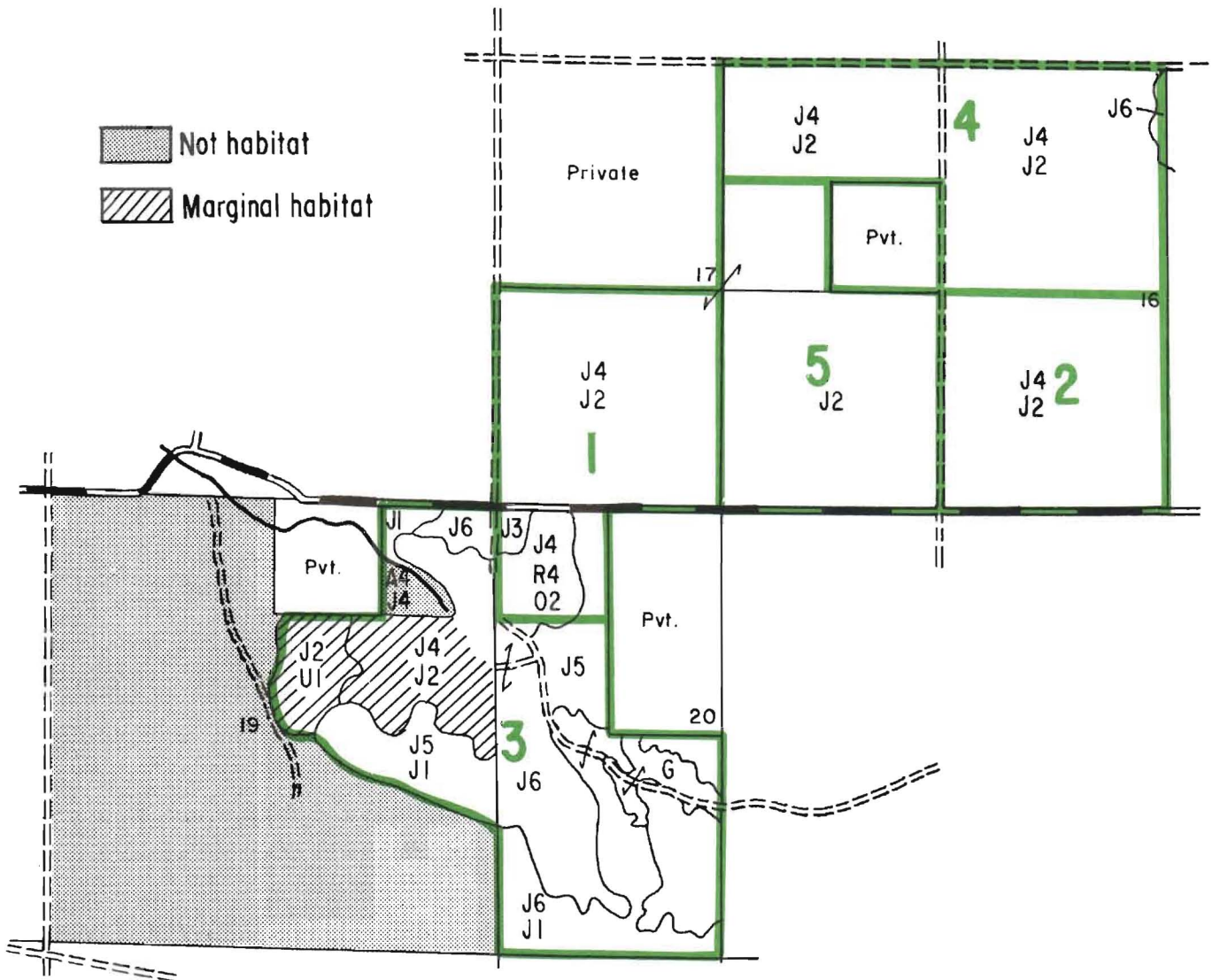
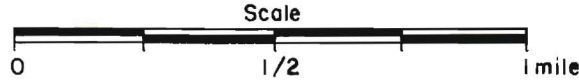
DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 6)

T 24 N , R 1 and 2 E ; OGEMAW CO. , MICH.

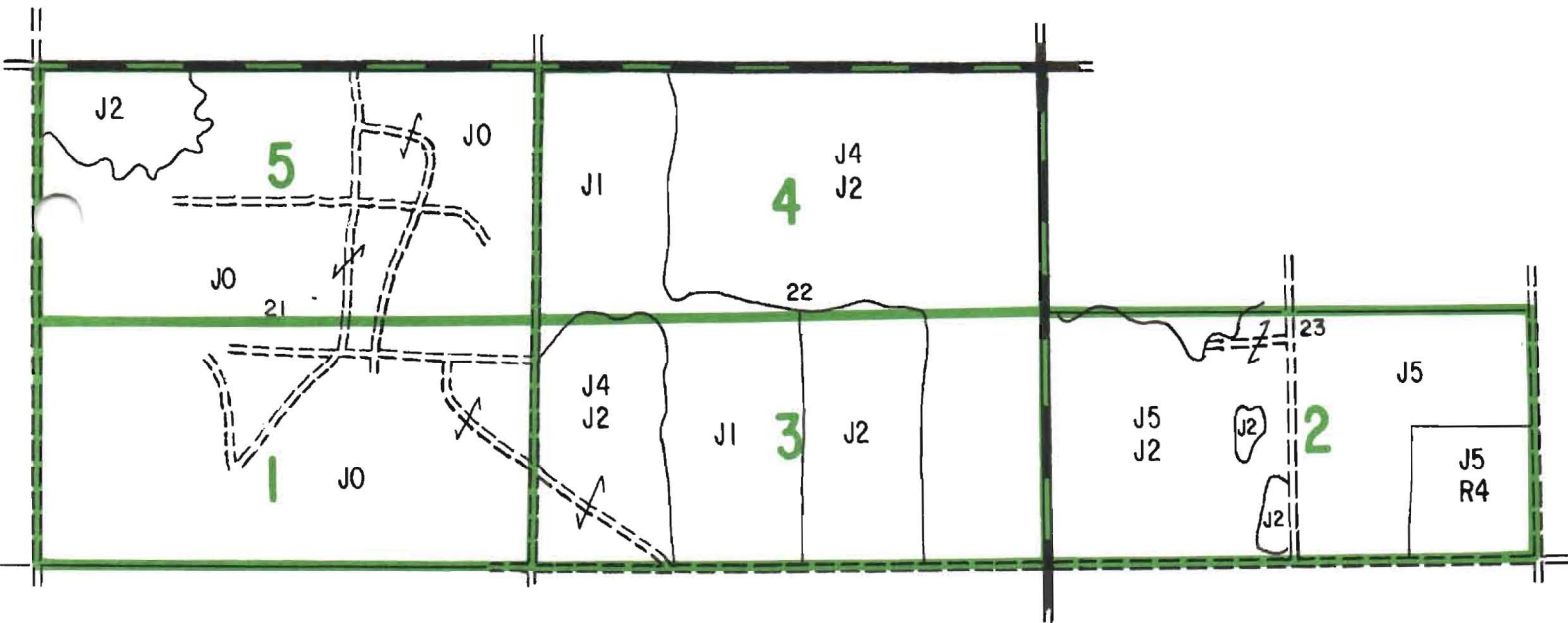
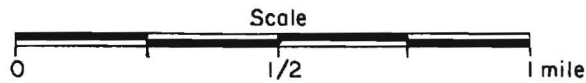




DAMON AREA KIRTLAND'S WARBLER MANAGEMENT UNIT (COMPARTMENT NO. 7)

T 24 N, R 1 E ; OGE MAW CO., MICH.



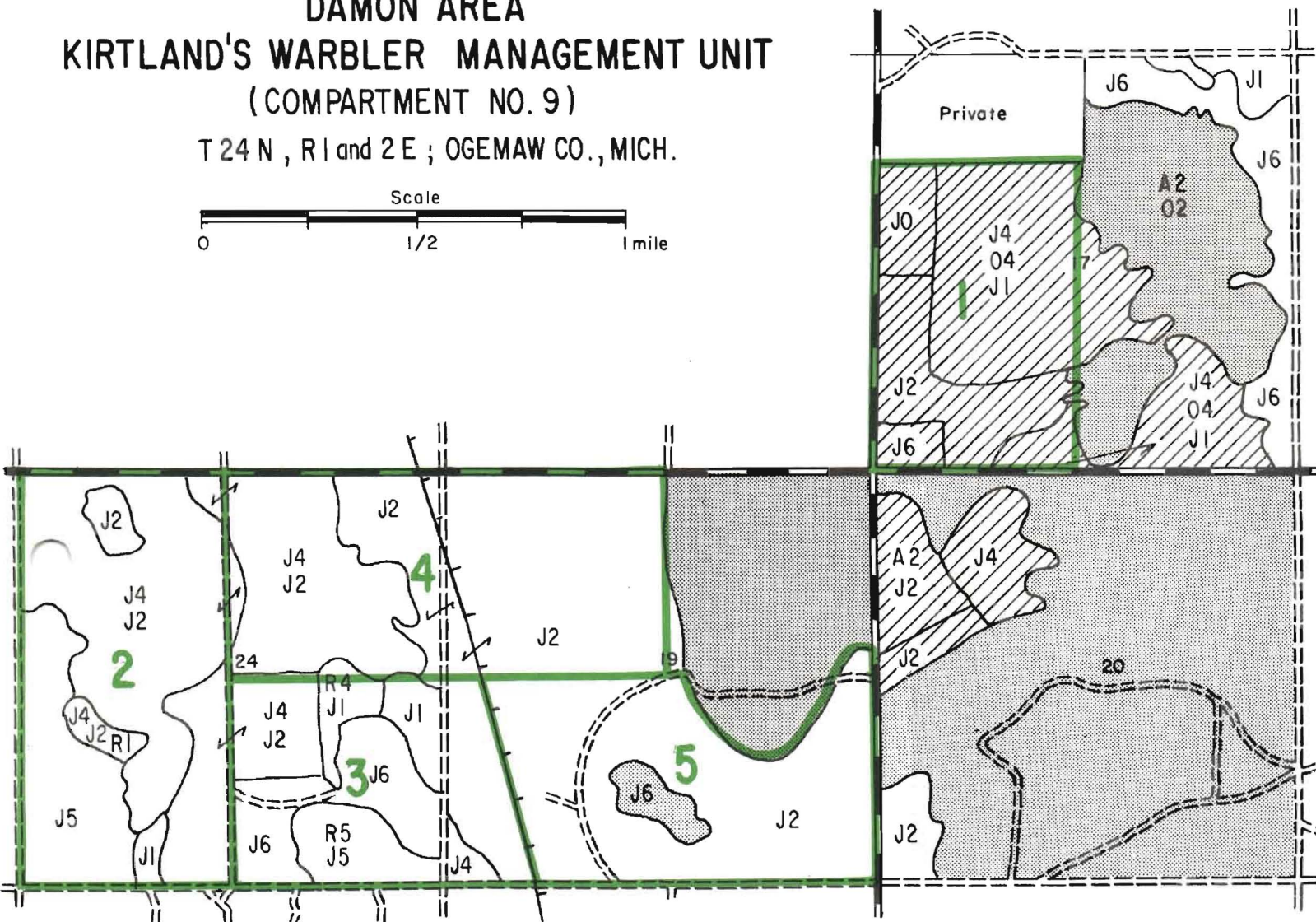
DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 8)
T24N , R1E ; OGEMAW CO. , MICH.



-  Not habitat
-  Marginal habitat

**DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 9)**

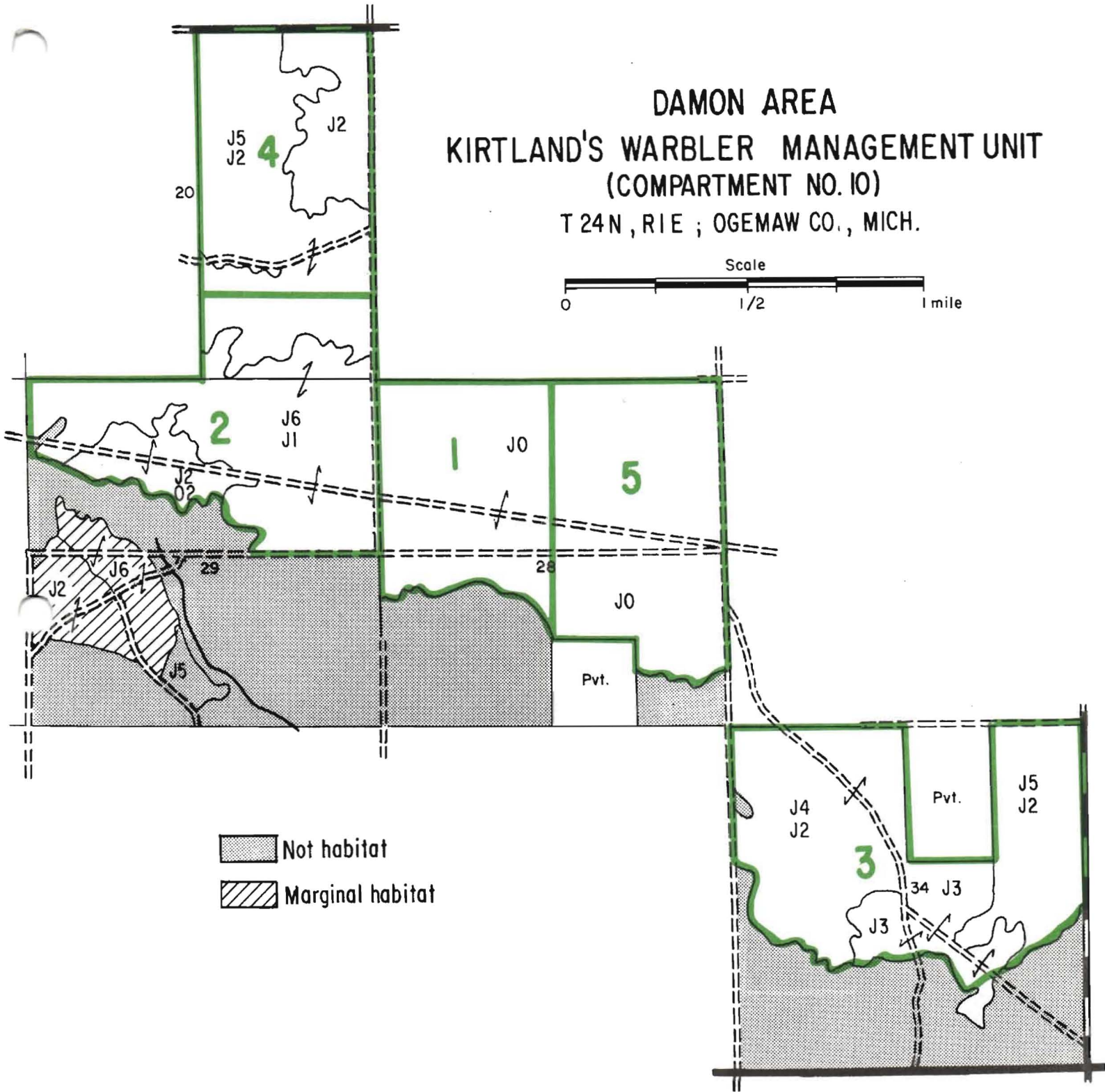
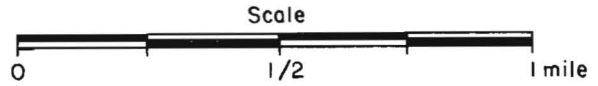
T 24 N , R 1 and 2 E ; OGEMAW CO., MICH.



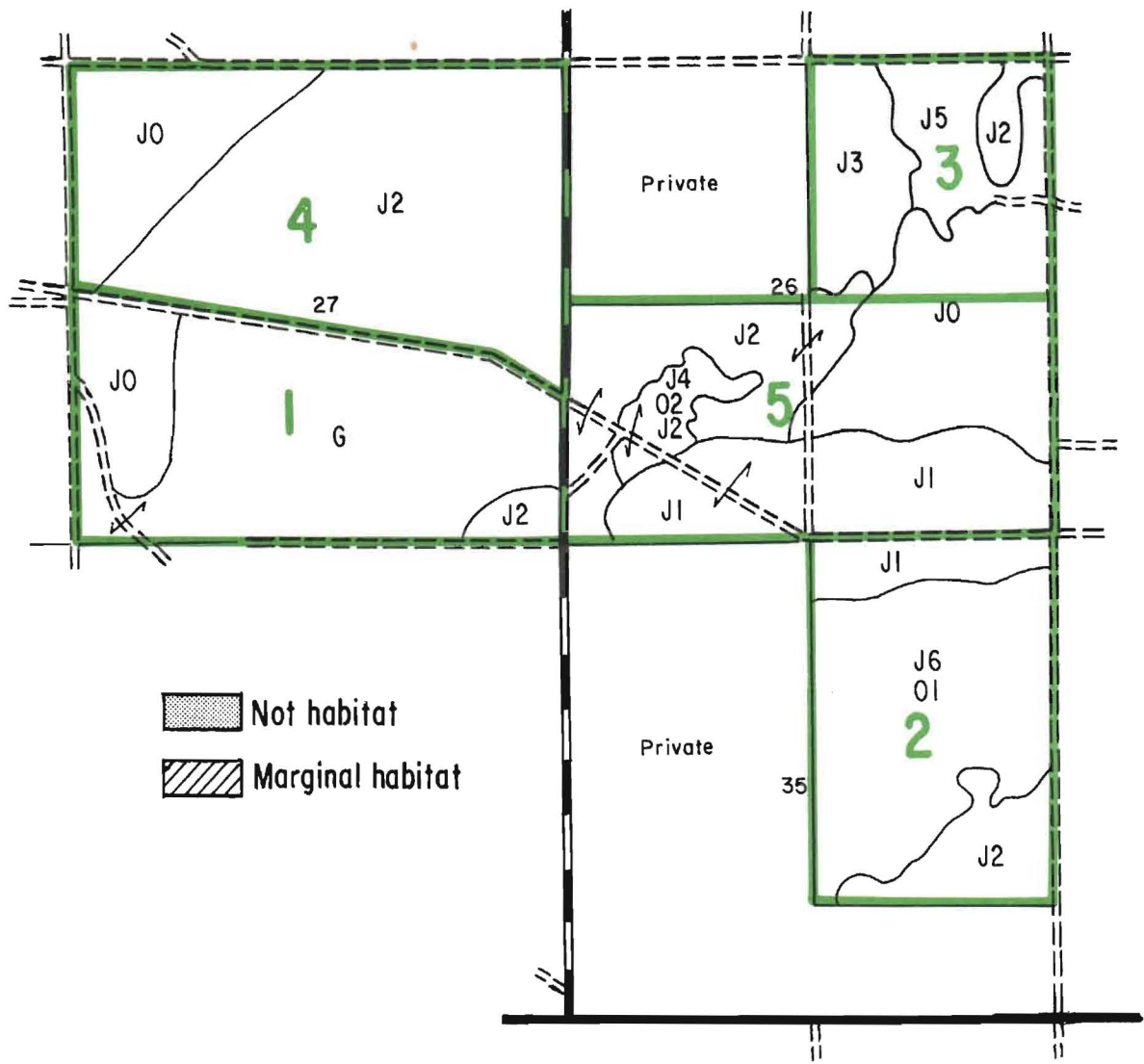
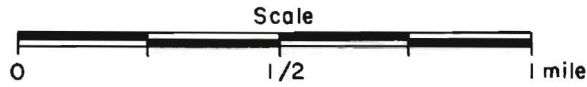
- Not habitat
- Marginal habitat

CUTTING BLOCKS-Compartment 10

DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 10)
T 24N, R 1E ; OGEMAW CO., MICH.



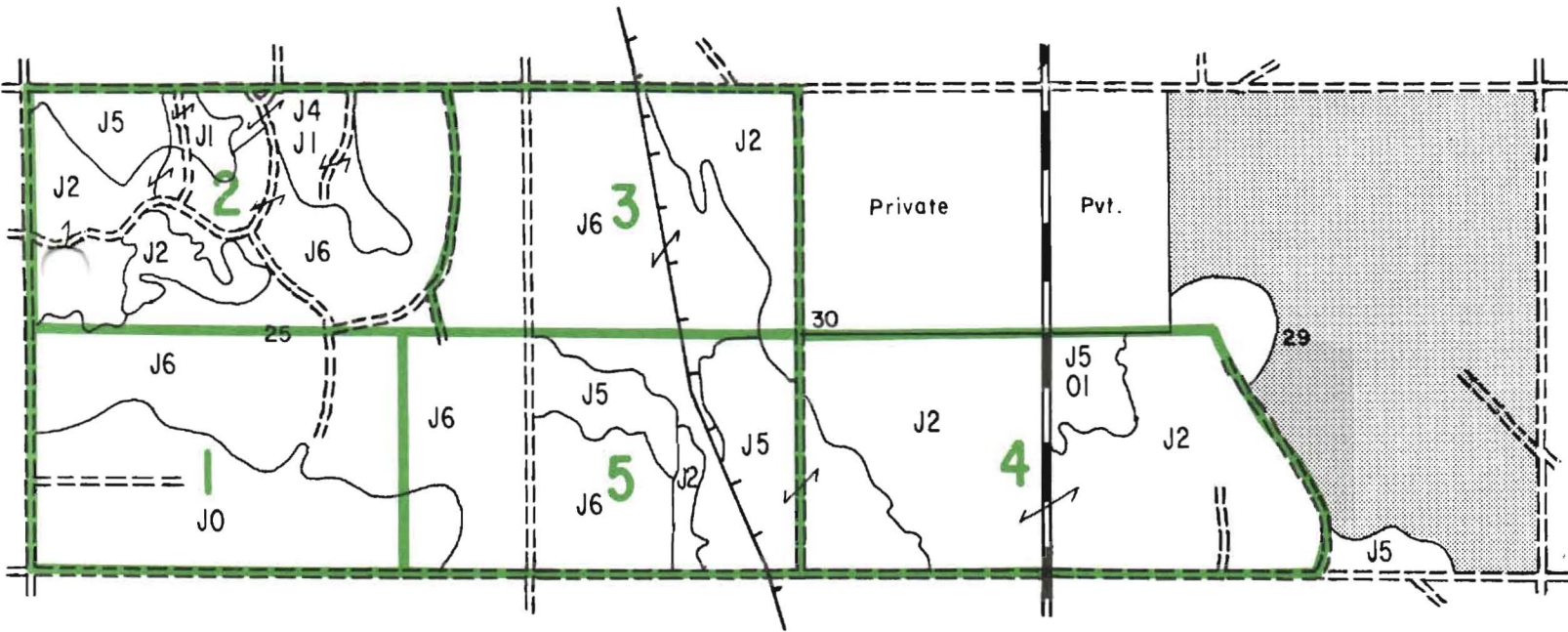
DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. II)
T24N, R1E ; OGEMAW CO., MICH.





- Not habitat
- Marginal habitat

DAMON AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 12)

T 24 N , R 1 and 2 E ; OGEMAW CO. , MICH.

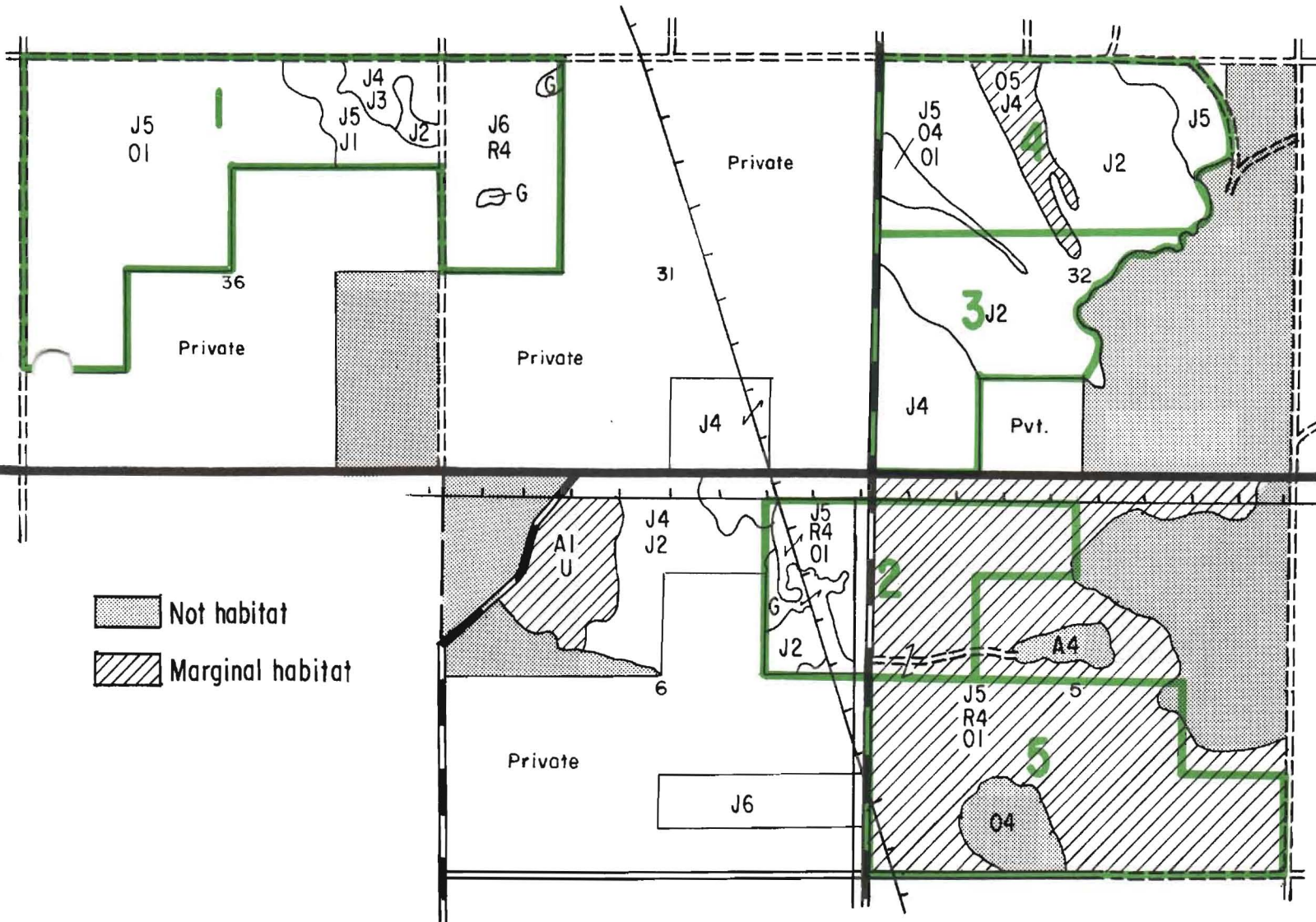
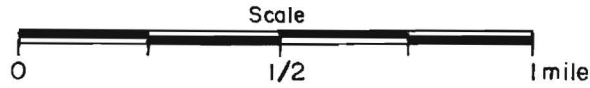


-  Not habitat
-  Marginal habitat

DAMON AREA

KIRTLAND'S WARBLER MANAGEMENT UNIT (COMPARTMENT NO. 13)

T 23 N, R 2 E and T 24 N, R 1 & 2 E; OGEMAW CO., MICH.



OGEMAW REFUGE KIRTLAND'S WARBLER MANAGEMENT AREA

Ogemaw County
T23N R1E and T24N R1E

Inventory Compartments:

Au Sable State Forest, Mio Area	43	(Management Unit 1)
	44	(Management Unit 2)
	45	(Management Unit 3)
	46	(Management Unit 4)
	47	(Management Unit 5)

Area Description

- A. General location and background information: The Ogemaw Refuge Kirtland's Warbler Management Area is located in west central Ogemaw County on the same large outwash plain of which the Damon Kirtland's Warbler Management Area is a part. Soils here again are sands, primarily the infertile Grayling sand. Oak ridges and moist aspen flats occasionally break up the expanse of jack pine. Located to the east of the Ogemaw Refuge Kirtland's Warbler Management Area is Clear Lake, an area of summer cottages. The Detroit and Mackinac railroad runs south of Management Units 3 and 4 and north of Management Unit 5.

The townsite of the old town of Beaver Lake is located in Management Unit 5 near the corner of sections 29, 30, 31 and 32. Note that the Beaver lake Cemetery is in the northeast-most corner of section 31, is 28 1/4 rods square, comprising approximately five acres.

Management Unit 5 consists of only Cutting Blocks 1 and 2.

- B. Land ownership patterns: Several parcels within the Management area are highly desirable for acquisition. Acquisition in some instances, however, would be difficult to achieve due to the parcels having been subdivided.
- C. Status of other resources: Of primary concern in the Ogemaw Refuge Area are the parcels of private land, often containing year-round or occasional residences.

The Area receives considerable off-road vehicle use. The Michigan Cross Country Cycle Trail runs through Management Unit 5. Furthermore, considerable additional riding takes place on unofficial trails and through the woods throughout the Area. Stricter enforcement of off-road riding regulations may be needed in the future.

The Michigan Midland to Mackinac Hiking Trail runs through Section 30. Relocation may be necessary to keep hikers out of posted nesting areas.

- D. Kirtland's warbler occupancy history: Although there are no known records of warblers in this Area until 1971, it is quite likely that portions were occupied earlier. Only a few Kirtland's have been present in this Area since 1971 and none were found in 1979.

OGEMAW REFUGE UNIT

Ogemaw County

Management Unit 1. Y.O.E. --- 8

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1978	11	J6	67	23
		4	J5	58	84
		3	J4	58	12
		9	<u>J5</u> J2	<u>58</u> 14 → 64	44
		5	J3	14 → 64	120
		7	J3	14 → 64	32
		10	J2	14 → 64	39
		21	J2R2	14 → 64	98
		22	J2	14 → 64	<u>10</u>
		TOTAL			

Comments: For the present rotation (1978), only the jack pine in the fifty and sixty year age classes is to be saved. The second rotation (2028) will see treatment of the entire stand.

2	1988	12	<u>J4</u>	<u>24</u>	<u>281</u>
			J2		
TOTAL					281

Comments: The jack pine is scattered and patchy, having been cut over in recent years. Remove all merchantable trees and sacrifice remainder of stand. Control burn should be performed to make this block an even age stand.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	1998	18	J2	32	74
		20	J3	43	197
		19	J1	33	<u>38</u>
				TOTAL	309

Comments:

4	2008	1	<u>O4</u> J2	<u>44</u>	83
		2	J3	44	22
		14	J2	50	41
		13	<u>J4</u> J2	<u>46</u>	31
		15	J2	49	135
		16	<u>O4</u> J2	<u>51</u>	20
		17	O5	57 ← 88	<u>15</u>
					TOTAL

Comments:

5	2018	3	J3	54	<u>234</u>
				TOTAL	234

Comments:

Management Unit 2. Y.O.E. --- 0

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*1	1980	13	J0	Already cut	136
		10	$\frac{J4}{J2}$	$\overline{20} \rightarrow 40$	59
		11	J3	$21 \rightarrow 41$	104
		12	J2	7	<u>80</u>
				TOTAL	379

Comments: The J0 stand and the stand which will be 7 years old in 1980 have recently been treated for the 1980 Y.O.E. They, in themselves, should be large enough to provide habitat. Therefore, the stands which will be 20 and 21 in 1980 are to be held from cutting until 2000. In 2030, when the second rotation is initiated, the entire Cutting Block will be cut as a unit. For the 1980 Y.O.E. the J0 stand in Section 17 should be burned if enough fuel exists to carry a fire, followed by a planting or seeding of jack pine. The J2 stand, which will be 7 years old in 1980, may need to be enhanced with some jack pine planting.

2	1990	9	$\frac{J4}{J2}$	$\frac{62}{27}$	95
		8	$\frac{J4}{J1}$	<u>62</u>	<u>157</u>
				TOTAL	252

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2000	7	J3	46	97
		5	J5	53 ← 75	20
		6	<u>O4</u> J2	<u>41</u>	12
		29	<u>J4</u> J3	<u>46</u>	<u>87</u>
				TOTAL	216

Comments: To prevent the J5 stand from loss due to overmaturity, cut it in 1978 at age 53. Do not attempt to reproduce this stand to jack pine at present, but hold to be treated and planted or seeded with remainder of Cutting Block 3 in 2000. At the time of removing the J5, scattered overstory jack pine and oak may also be removed from the other stands in Cutting Block 3.

*4	2010	3	J2	47	<u>210</u>
				TOTAL	210

Comments: This J2 stand has scattered jack pine and oak overstory. These should be removed in the near future to yield timber and make a more uniform age stand. Also in the part of the Cutting Block north of the NE-SW running trail road there is invasion by hardwood and brush. This area should be burned and replanted at an early opportunity.

5	2020	1	J2	56	243
		2	<u>O4</u> J2	<u>57</u>	<u>49</u>
				TOTAL	292

Comments:

Management Unit 3. Y.O.E. --- 7

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1977	10	J3	20	54
		8	<u>J4</u> J2	<u>42</u> 18	9
		12	<u>J5</u> J1	60	100
		11	<u>O4</u> J2	<u>24</u>	26
		9	J0	Already cut	<u>135</u>
				TOTAL	324

Comments: The J0 stand has just been cut. It should now be burned, followed by planting. This treatment, however, may wait for the remainder of the Cutting Block to be cut at which time the whole Block may be treated.

2	1987	5	J4	45	160
		13	J3	42	79
		15	J4	54	<u>36</u>
				TOTAL	275

Comments:

3	1997	14	J3	52	64
		17	J4	64	44
		18	J1	24	32
		16	J4	49	<u>53</u>
				TOTAL	193

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2007	7	$\frac{J4}{J2}$	52 ← $\frac{72}{48}$	128
		1	$\frac{J2}{J2}$	$\frac{58}{41}$	<u>165</u>
TOTAL					293

Comments: The J4/J2 stand should have the overstory removed in 1987, if such a cut is commercially possible. Due to medium to heavy grass cover in this Cutting Block, burning must be done after the Block is clearcut.

*5	2017	2	J3	64	76
		3	$\frac{J4}{J2}$	52 ← $\frac{82}{58}$	135
		4	J4	45 ← 75	29
		6	J1	43	<u>80</u>
TOTAL					320

Comments: Remove the J4 stand and the overstory of the J4/J2 stand in 1987 to prevent loss of timber volume. After 2017 the entire block will be entered every fifty years.

Management Unit 4. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1979	9	J0	Already cut	80
		10	J5	55	80
		11	<u>J4</u> J1	<u>55</u>	<u>70</u>
				TOTAL	230

Comments:

2	1989	12	J3	35	82
		13	J6	58	<u>132</u>
				TOTAL	214

Comments: A wildfire in 1977 will modify these types somewhat, but cutting should be carried out as listed here.

3	1999	1	<u>O4</u> J2	<u>45</u>	80
		2	J2	30	<u>80</u>
				TOTAL	160

Comments:

4	2009	5	J3	58	110
		8	J0	32	<u>25</u>
				TOTAL	135

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2019	4	J3	68	111
		3	J4 J2	50 ← <u>92</u> 53	60
		6	J1	49	20
		7	J2	56	<u>16</u>
				TOTAL	207

Comments: The J4/J2 stand should have the overstory removed in the near future. The J4 component is currently 50 years old.

Management Unit 5. Y.O.E. --- 1*

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1981		J3	11	37
			J4	53	50
			J2	18	21
			J2	23	20
			J5	54	6
			<u>J4</u>	<u>56</u>	
			<u>J1</u>	<u>13</u>	39
			<u>J4</u>	<u>—</u>	35
			<u>J1</u>	<u>11</u>	21
			<u>J4</u>	<u>67</u>	
			<u>J2</u>	<u>23</u>	<u>80</u>
				TOTAL	309

Comments: Parts of this Block may have only marginal warbler potential. Therefore, it must be burned hot to control brush.

Note that management problems may be encountered due to the presence of the Cross Country Cycle Trail and the Midland-to-Mackinac Hiking Trail through the Block, much off-trail cycle use, and an old cemetery in the middle of the Block. Note that the cemetery is in the northeast-most corner of Section 31, is 28 1/4 rods square, and comprises approximately 5 acres.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
2	1991		<u>J6</u> <u>J1</u>	<u>59</u>	89
			J404R4	59	92
			<u>J4</u> <u>J1</u>	<u>61</u> <u>23</u>	<u>39</u>
				TOTAL	220



Comments: Most of this Block has marginal potential for warblers and therefore should be burned following cutting.

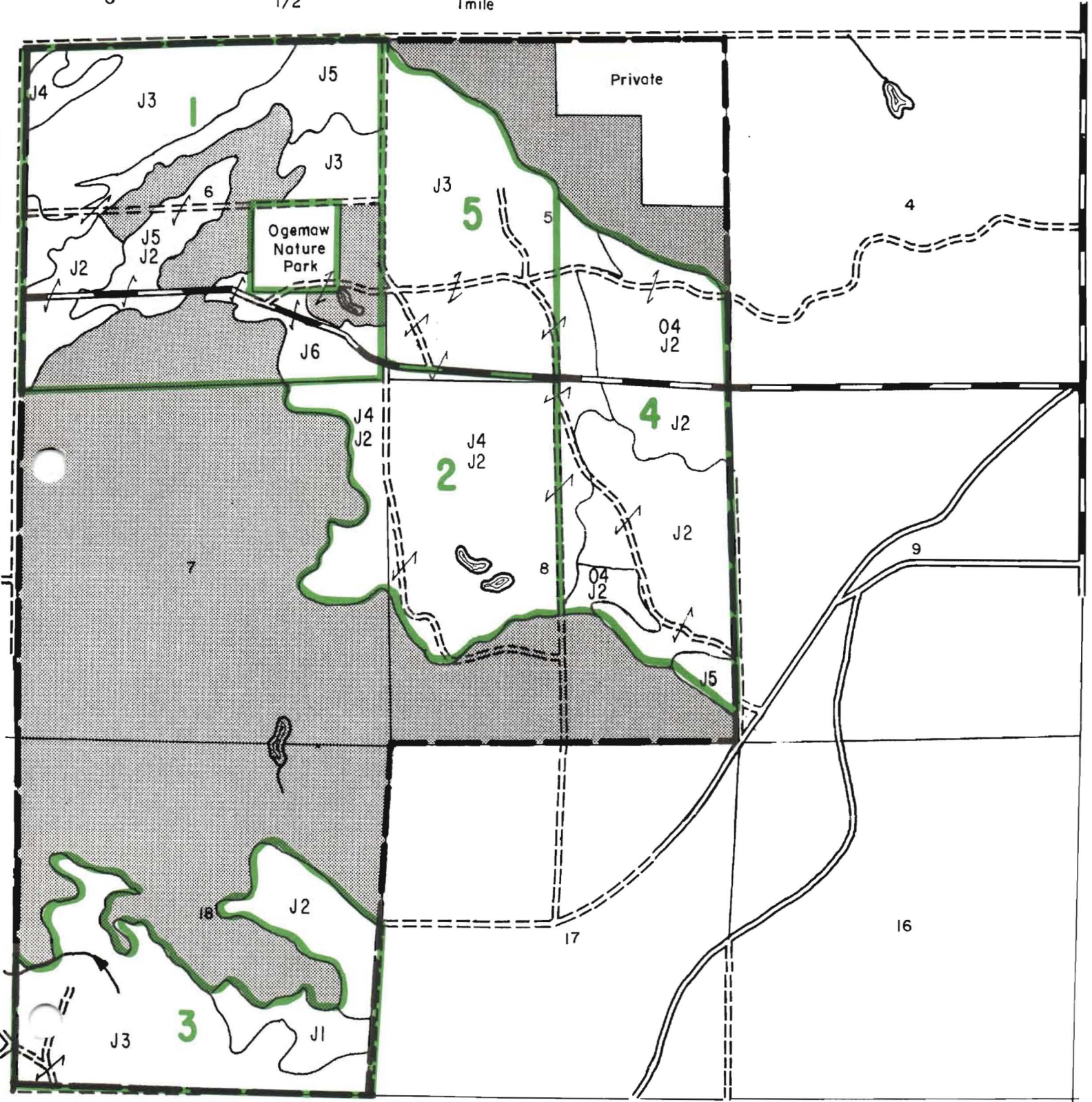
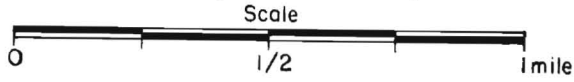
¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

OGEMAW REFUGE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 1)

T 23 N , R 1 E ; OGEMAW CO , MICH.

CUTTING BLOCKS - Compartment 1

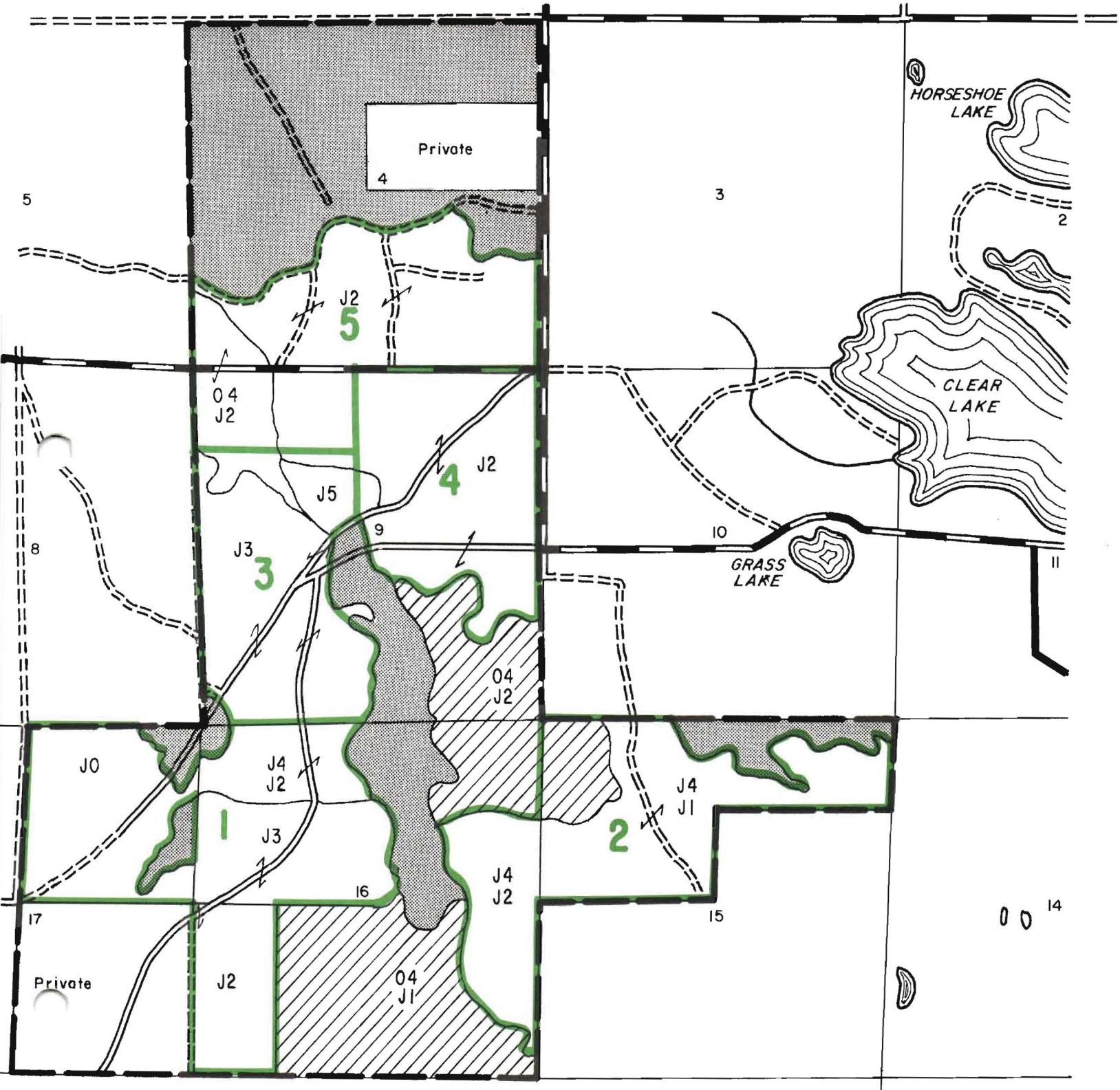
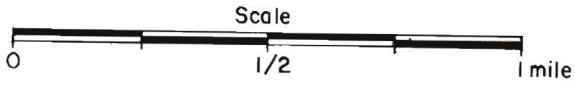
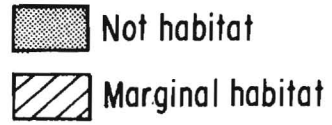
-  Not habitat
-  Marginal habitat



OGEMAW REFUGE AREA
 KIRTLAND'S WARBLER
 MANAGEMENT UNIT
 (COMPARTMENT NO. 2)

T 23 N , R 1 E ; O G E M A W C O , M I C H .

CUTTING BLOCKS - Compartment 2

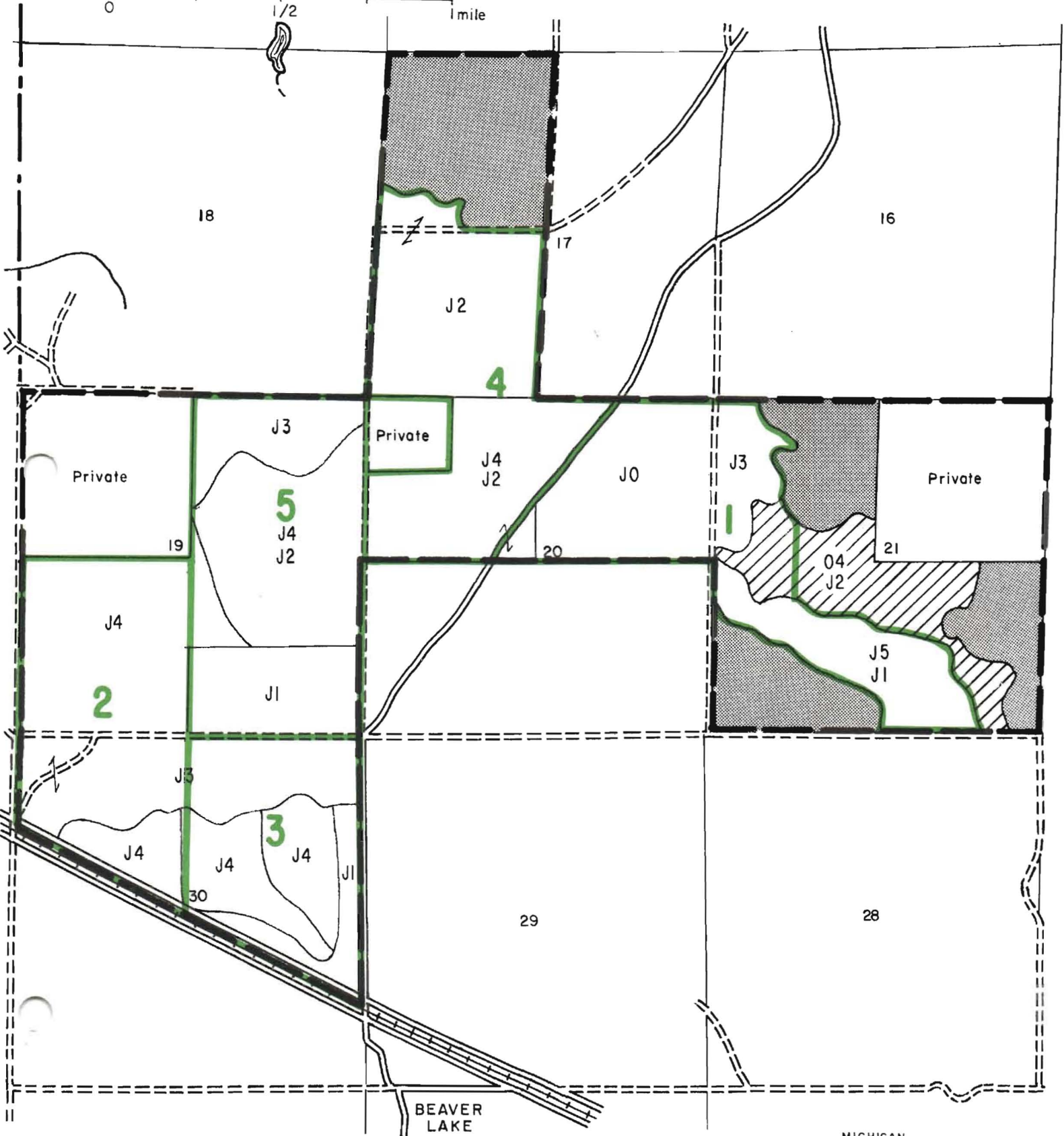
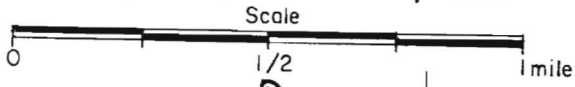


OGEMAW REFUGE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 3)

T23N, R1E ; OGEMAW CO, MICH.

CUTTING BLOCKS - Compartment 3

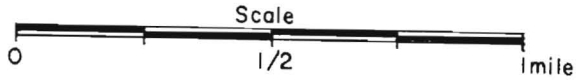
Not habitat
Marginal habitat



OGEMAW REFUGE AREA
 KIRTLAND'S WARBLER
 MANAGEMENT UNIT
 (COMPARTMENT NO. 4 and 5)
 T 23N, R 1E; OGEMAW CO., MICH.

CUTTING BLOCKS - Compartment 4,5

Not habitat
 Marginal habitat



MUSKRAT LAKE KIRTLAND'S WARBLER MANAGEMENT AREA

Oscoda County
T27N, R1E and T27N, R2E

Inventory Compartments:

Au Sable State Forest, Mio Area	4 (Management Unit 1)
	9 (Management Unit 2)
	8 (Management Unit 3)

Area Description

- A. General location and background information: The Muskrat Lake Kirtland's Warbler Management Area is located seven miles northwest of Mio. This Area lies on a flat to very gently rolling outwash plain running from Muskrat Lake southwest to the settlement of Red Oak. Considerable acreage in this Management Area was planted to red pine in the 1930's and most of these plantations are growing reasonably well. Some stands in the Area contain significant amounts of oak but most are essentially pure stands of jack pine or mixed jack pine and red pine.

The original Muskrat Lake Mangement Area, established in 1958, is incorporated into this Area and future management will follow as per the guidelines set up in this Habitat Management Plan.

- B. Land ownership patterns: The area of potential habitat is mostly state-owned but several private parcels could provide additional habitat if acquired. Some of these parcels have been subdivided and cabins and houses have been built on these lands. Precautions will have to be taken when cutting and burning are undertaken adjacent to these parcels.

- C. Status of other resources: The Management Area receives moderate to heavy human use due to the presence of the Cross Country Cycle Trail (motorcycle), the ROLL snowmobile trail, the Muskrat Lake snowmobile trail, and the Muskrat Lake State Forest Campground. Precautions will be necessary for treatment of Cutting Blocks near the campground but this should present only minimal problems. Rerouting of the CCC trail will likely be required in the near future.

Two hard-surface county roads (Co. 608 and 489) cross this Management Area. These roads receive moderate traffic and visual impact of habitat manipulation adjacent to these roads will need to be considered.

A high voltage electrical transmission line crosses the northeast portion of the Area. Treatment of stands adjacent to this line will also require special precautions. This transmission line runs on utility-owned fee title land, approximately 365 feet in width.

- D. Kirtland's warbler occupancy history: Warblers were reported in this Area on the 1951 census and on all censuses since 1972. Recorded and probable history of this Area, however, suggests that warblers were present in the Area for varied periods of time prior to the 1951 count.

MUSKRAT LAKE AREA

Oscoda County

Management Unit 1. Y.O.E. --- 8

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment¹</u>	<u>Acreage</u>
1	1978	1	J6	51	165
		3	J6	47	30
		2	J2	26	<u>25</u>
TOTAL					210

Comments:

2	1988	4	<u>J5</u> J2	<u>60</u> 35	118
		5	J6	65	22
		6	J5	62	72
		7	J6	62	18
		8,9	Misc.		<u>35</u>
TOTAL					265

Comments: The jack pine type is narrowed near the center of this Block by oak and aspen associations. To create a continuous expanse of young trees, it is suggested the Block be cut as per the map. However, care must be taken not to expand the aspen type. This Block must be burned following cutting. A summer burn is preferred. Aspen should be treated with a silvicide and not cut until dead.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	1998	15	J2	46	76
		14	J6	71	60
		13	J5	67	78
			J202		
		11	J6	67	4
		12	J4	67	25
J2	40				
TOTAL					243

Comments: Older trees in this Block may be taken off prior to 1998; however, the entire Block must be cut and regenerated in 1998.

*4	2008	19	J4	62	112
			J1		
		16	J2	60	99
			O1		
		17,20	J5	← 84	23
18	J4	55	84		
	J2	45			
TOTAL					318

Comments: The J5 stand may be removed prior to 2008.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2018	23	<u>R4J4</u> J1R1	<u>81</u>	18
		29	<u>J4</u> J1	← 72	10
		25	R4J4	85	114
		29	<u>J2</u> O1	<u>70</u>	2
		29	<u>J4</u> J2	<u>65</u> 55	3
		24	<u>R4</u> J2R1	<u>81</u>	9
		26	<u>R4J4</u> J2	<u>90</u>	134
		27	<u>J4</u> J2	← <u>90</u> 60	14
		21,28	J5	← 83	20
		22	J1	60	<u>10</u>
				TOTAL	334

Comments: Jack pine may be removed from these mixed jack pine/red pine stands prior to 2018, allowing the red pine to attain sawlog size and approximately 80 to 90 years of age. In 2018 the entire Block must be burned and regenerated to jack pine.

Management Unit 2. Y.O.E. --- 0

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*1	1980	2	J3	Wait until next rotation	230
		4	J0	(see "Comments following Cutting Block 2)	103
		1	J101	Already cut	41
		5	J2	(Wait until next rotation)	8
		3	R4J4	60	<u>9</u>
				TOTAL	391

Comments: The J0 stand will be treated with part of Cutting Block 2 as soon as possible. (See "Comments" following Cutting Block 2 and see area within the dashed lines on the map.)

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>		
*2	1990	6	<u>J5R4O4</u> J2	<u>64</u> 40	29		
		7	<u>J4R4O4</u> J2	<u>45</u> 36	76		
		12	<u>J5</u> J2	<u>56</u>	21		
		10	<u>J4O4</u> J3	<u> </u> 36	24		
		11	R5J4O4	60	4		
		8	J6	58	35		
		9	<u>R4</u> J2	28 ← <u>40</u> 11 ← <u>21</u>	33		
		13	<u>R4</u> J2	<u>40</u> 21	26		
		14	J5	52	28		
		16	J5R4	48 ← 60	5		
		15	J5R4	60	<u>4</u>		
						TOTAL	285

Comments: The J5 stand, part of the R4/J2 stand, and part of the J5R4 stand should be cut as soon as possible. They will then be burned and planted to jack pine with the J0 stand of Cutting Block 1. (See the area within the dashed lines on the map.) This cutting scheme will provide continuous Kirtland's Warbler habitat in Management Unit 2. Other than this deviation, the Blocks will be entered as listed in the year-of-entry column. The second rotation will honor the Cutting Blocks as delineated (boundaries are the section lines between sections 6, 7, and 12).

All prescribed areas in Blocks 1 and 2 should be burned with a hot fire, preferably in late July or August, following cutting.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	2000	20	<u>J4R404</u> J2	<u>74</u>	26
		18	<u>J404</u> J2	<u>42</u>	150
		19	<u>J4</u> J101	<u>53</u>	109
		17	<u>J404</u> J3	<u>46</u>	<u>75</u>
				TOTAL	360

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2010	29	<u>R5</u> 01	<u>74</u>	65
		27	J3	40	6
		26	<u>R4J4</u> J2	<u>75</u> 48	29
		21	<u>J4</u> J1	← <u>77</u>	41
		23	J5R4	77	29
		22	J4J3	← 77	19
		24	<u>R4J4O4</u> J2	<u>77</u> 47	56
		25	R5J4	77	43
		28	<u>R5J4O4</u> 02	<u>62</u>	<u>12</u>

Comments: This Block has slightly higher site indexes than other blocks in the Management Unit and has been planted to a jack pine/red pine mixture. The red pine will be harvested in 2010 and should provide commercial sawlogs. In 2010 the entire Block must be cut and burned. It will be regenerated to jack pine for the Kirtland's Warbler. Prior to 2010, products may be harvested on a selection basis to prevent loss of timber resources.

Furthermore, the CCC cycle trail passes directly through the center of the Cutting Block. This trail should be re-routed prior to occupation of the Block by warblers.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
5	2020	32	<u>J4R4</u> J2	<u>67</u> 47	90
		35	<u>J5R4</u> J1	<u>90</u>	38
		30	<u>J6</u> 01J1	← 90	20
		31	<u>J4R4O4</u> J2	<u>72</u>	68
		33	J6R4	84	79
		34	J4R4	90	<u>25</u>
		TOTAL			

Comments: This Block was planted to a jack pine/red pine mixture in the 1930's. Prior to 2020, products may be harvested on a selection basis to prevent loss of timber resources. The red pine will be harvested in 2020 and should provide commercial sawlogs. At this time the entire Block will be cut, burned and regenerated to jack pine.

Management Unit 3. Y.O.E. --- 2

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1982	7	<u>J4R4</u> J2	<u>29</u> 9	11
		8	J4R4	52	3
		2	J6R4	48	40
		1	J5R4	51	101
		5	<u>J4</u> J2	49	58
		6	J6	51	18
		4	J0	3	18
		3	J2	18	43
		9	Misc.		<u>6</u>
TOTAL					298

Comments:

2	1992	12	J5R4	61	153
		11	<u>J5</u> J3	<u>56</u>	117
		10	J2	34	57
		14	<u>J4</u> J2	61 42	38
		13	<u>J4R4</u> J2	<u>61</u>	12
		15	<u>J4</u> J1	<u>34</u>	<u>7</u>
		TOTAL			

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
3	2002	18	J0	24	10
		19	J3	38	189
		17	J2	42	22
		16	<u>R5</u> J1	<u>71</u>	17
		20	J2A101	47	<u>23</u>
TOTAL					261

Comments:

4	2012	23	J2	67	55
		21	J3	48	196
		22	J0	32	<u>39</u>
TOTAL					290

Comments:

*5	2022	25	J5R4	91	311
		24	J6	← 96	21
		26	J3	58	<u>29</u>
TOTAL					361

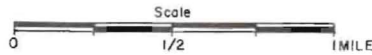
Comments: This Block is not scheduled to be harvested until 2022 to allow the red pine plantation to reach a commercial sawlog size. The interplanted jack pine, however, may be removed prior to 2022. In 2022 the entire block will be cut and regenerated to jack pine exclusively.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

MUSKRAT LAKE AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

OSCODA COUNTY, MICHIGAN

T 27 N, R 1 and 2 E



TYPE CLASSIFICATION

- O - Oak-red, white or black
- J - Jack Pine
- R - Red Pine
- A - Aspen, White Birch

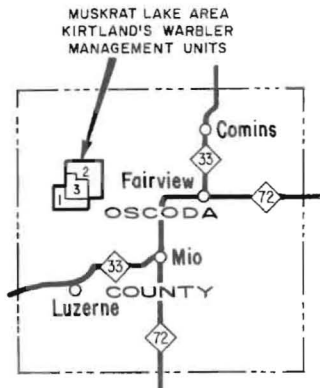
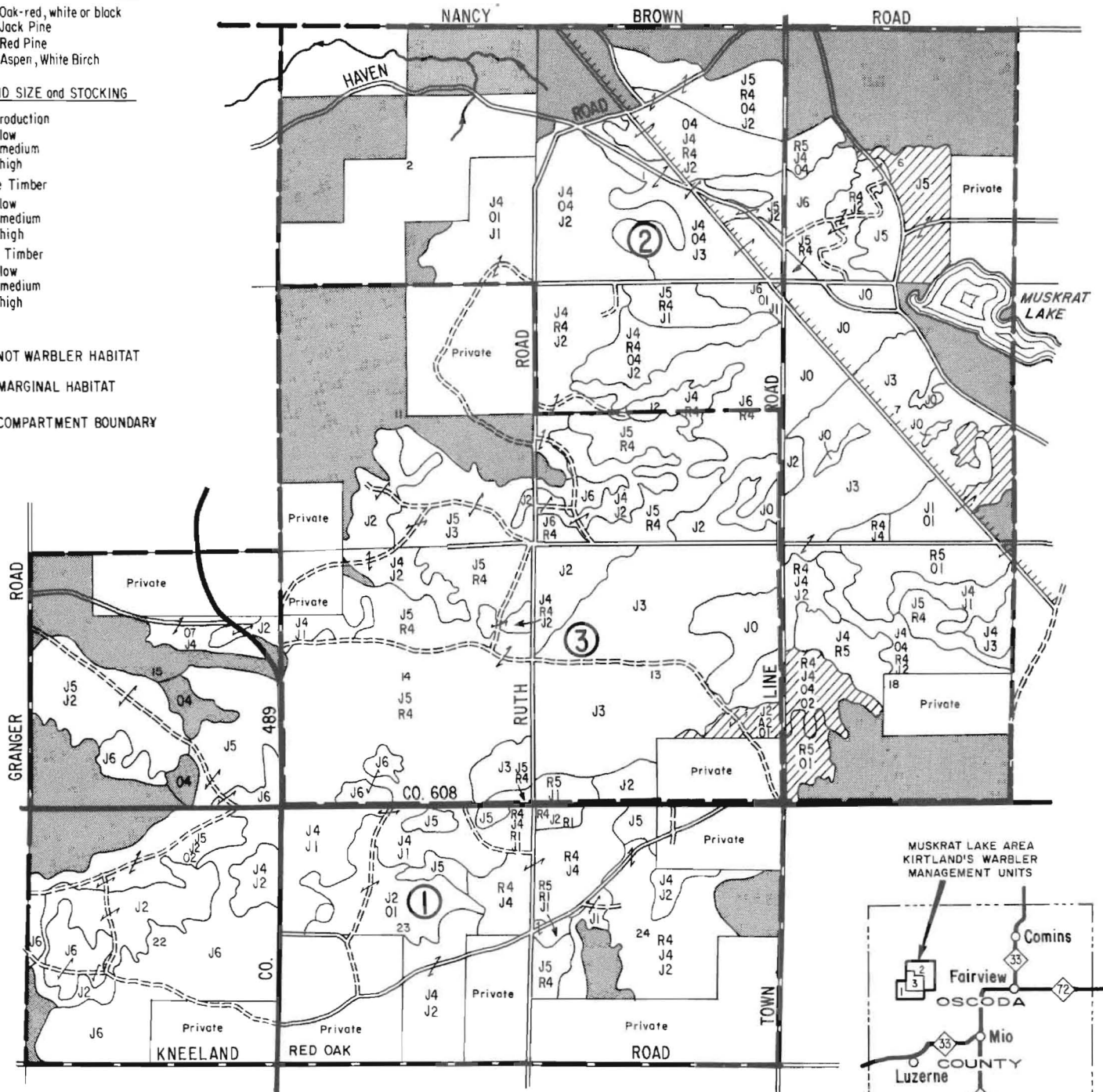
STAND SIZE and STOCKING

- Reproduction
- 1 - low
 - 2 - medium
 - 3 - high

- Pole Timber
- 4 - low
 - 5 - medium
 - 6 - high

- Saw Timber
- 7 - low
 - 8 - medium
 - 9 - high

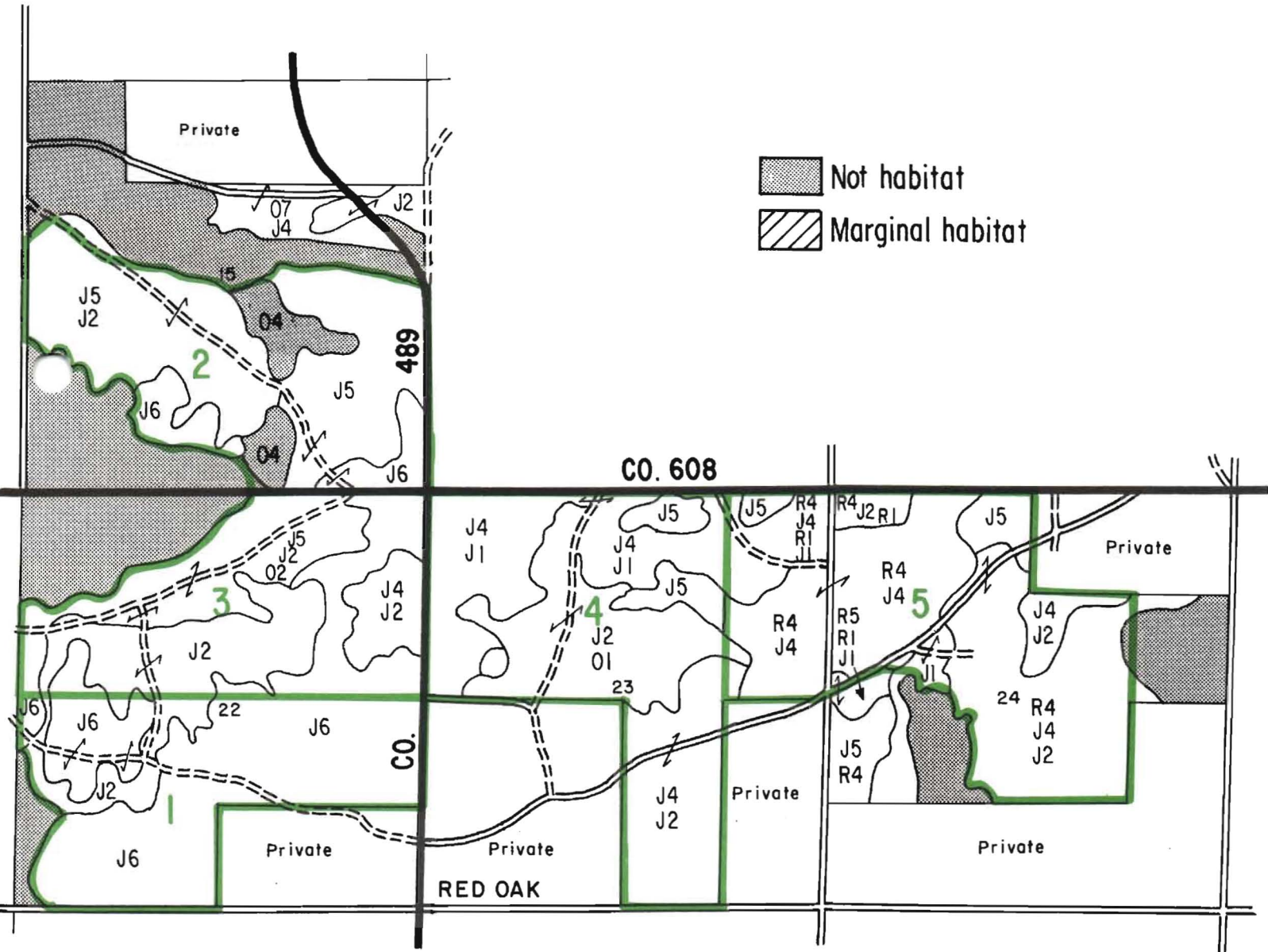
- NOT WARBLER HABITAT
- MARGINAL HABITAT
- COMPARTMENT BOUNDARY



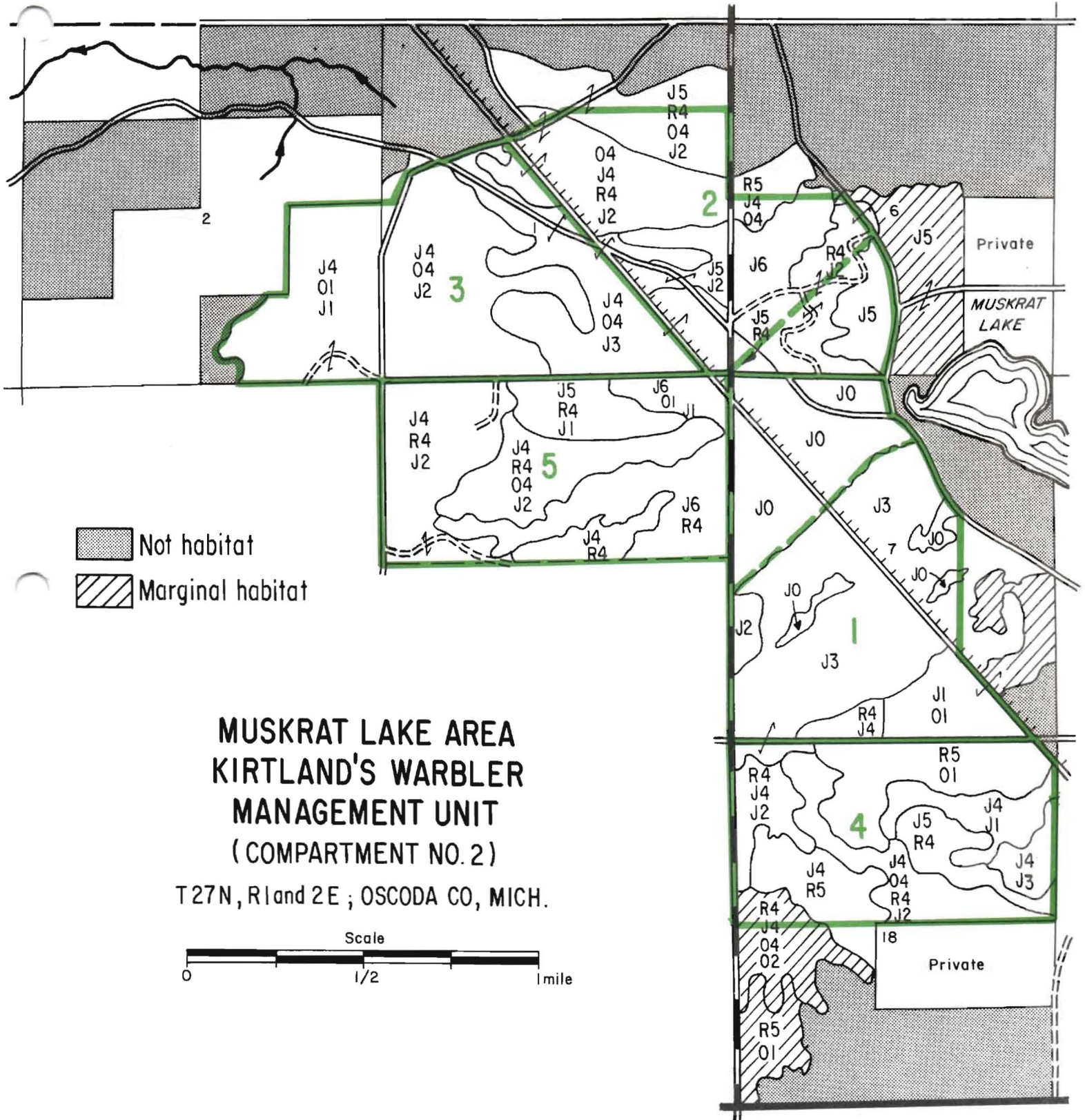
CUTTING BLOCKS - Compartment 1

MUSKRAT LAKE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 1)

T 27 N , R 1 E ; OSCODA CO., MICH.



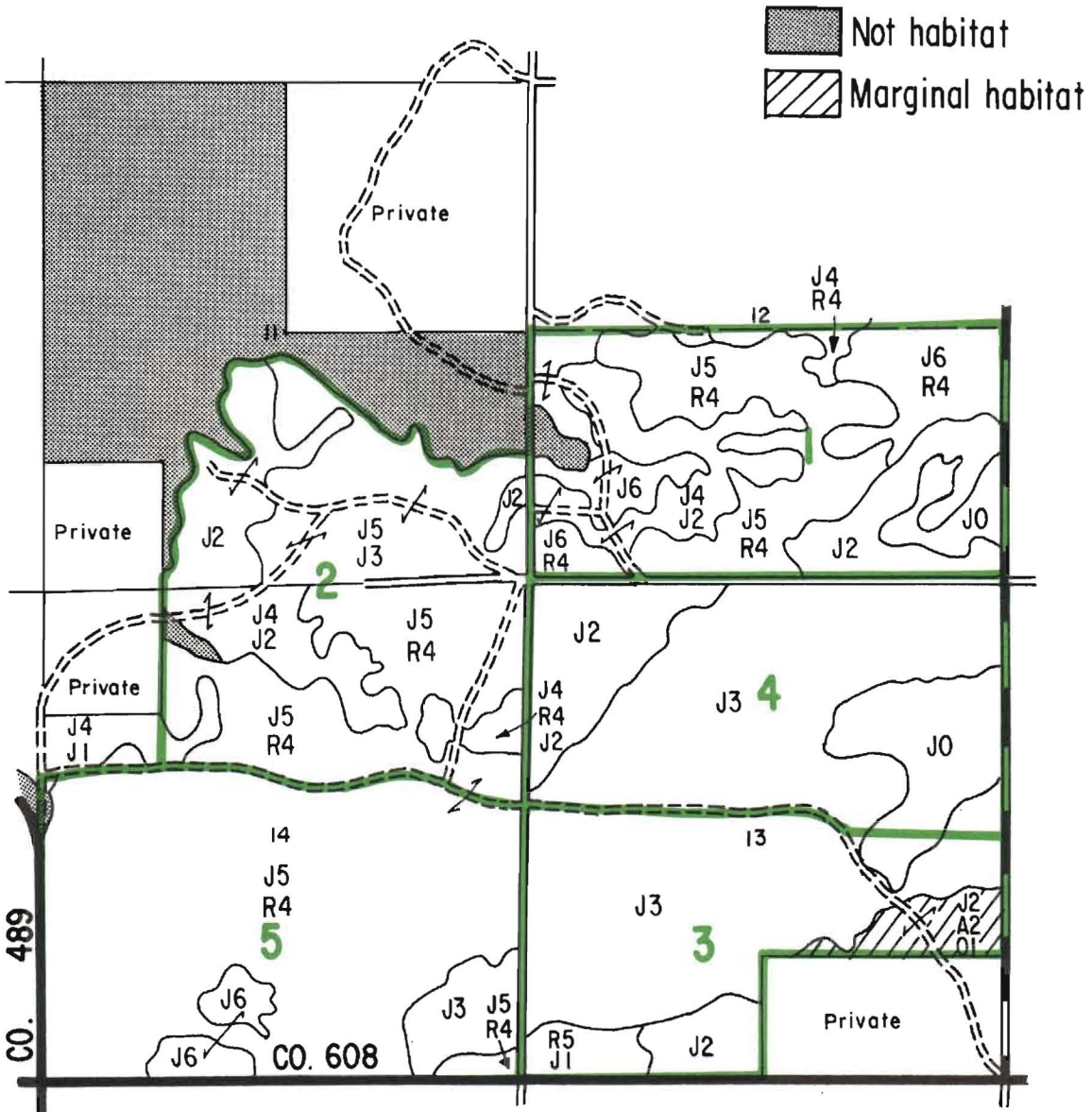
CUTTING BLOCKS - Compartment 2



CUTTING BLOCKS - Compartment 3

MUSKRAT LAKE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 3)

T 27 N , R 1 E ; OSCODA CO., MICH.



WARBLER MONUMENT KIRTLAND'S WARBLER MANAGEMENT AREA

Oscoda County
T26N R1E and T27N R1E

Inventory Compartments:

Au Sable State Forest, Mio Area 1 (Management Unit 1)

Area Description

- A. General location and background information: The Warbler Monument Kirtland's Warbler Management Area is located on the west edge of Oscoda County two miles southwest of Red Oak on the north side of the Au Sable River. This area is on a flat to very gently rolling sand plain surrounded by better soils on all sides. Most stands in this Area are nearly pure jack pine.

The Area is named for the monument which was placed at the where the first Kirtland's Warbler's nest was found in 1903.

- B. Land ownership patterns: A 160-acre private parcel in the center of this Area presents some special management problems due to its location, and acquisition would be most desirable. Additional private parcels to the south and west offer additional potential habitat.
- C. Status of other resources: County 606, a fairly well traveled gravel road, passes through this Area and visual management techniques should be considered for some stands adjacent to this road. There are leased cabin sites on some of the property owned by Consumers Power Company to the south of the Area, and there is potential for the building of residences on some of the other private lands nearby. At the present time, however, development on adjacent private lands should not pose serious problems.
- The Area receives generally light recreational use by ORV's, berrypickers, and hunters.
- D. Kirtland's warbler occupancy history: This area has the oldest documented history of warbler nesting of all the Management Areas. Since 1903 when the first nest was found in this area, there were no other known observations until 1979 when three singing males were censused.

WARBLER MONUMENT AEA

Oscoda County

Management Unit 1.¹ Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ²	<u>Acreage</u>
*3	2003	3	J5	55 ← 75	49
		4	<u>O4</u> J2	<u>50</u>	<u>97</u>
				TOTAL	146

Comments: The O4 component of the O4/J2 stand and the J5 may be cut prior to 2003. Approximately 20 years prior is suggested, but actual time of the cut may be left to the discretion of the Area Forester.

4	2013	2	<u>J4</u> J2	<u>68</u> 50	<u>222</u>
				TOTAL	222

Comments:

5	2023	1	J3	55	<u>186</u>
				TOTAL	186

Comments:

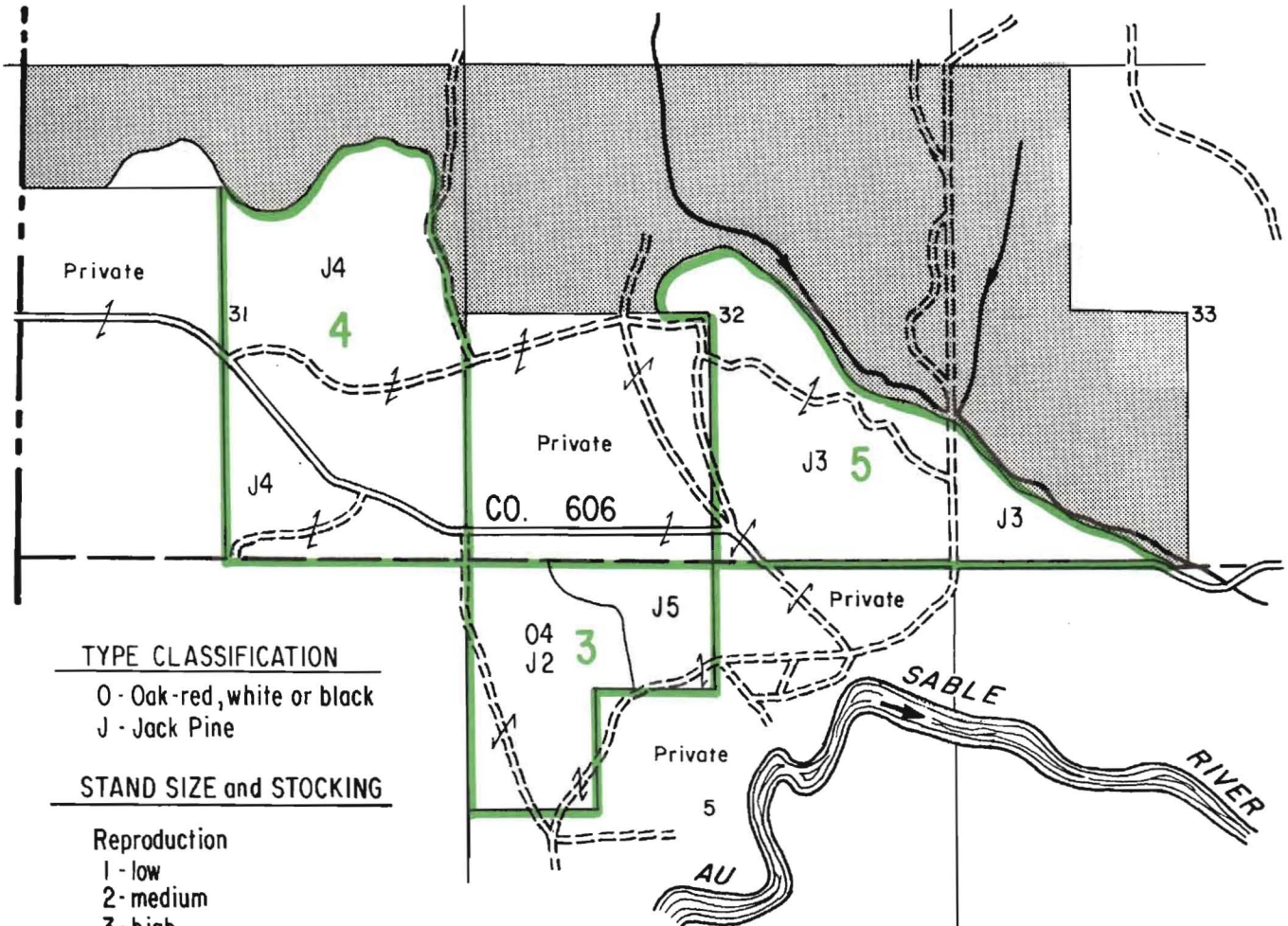
¹Note that this Compartment has only three Cutting Blocks, due to its limited warbler habitat potential. Surrounding private land, however, has potential warbler habitat. It is strongly recommended that this land be purchased and/or agreements contracted with the landowners in order to expand management for the Kirtland's Warbler.

²Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.



WARBLER MONUMENT AREA KIRTLAND'S WARBLER MANAGEMENT UNIT

OSCODA COUNTY, MICHIGAN
T26 and 27N, R1E



TYPE CLASSIFICATION

- O - Oak-red, white or black
- J - Jack Pine

STAND SIZE and STOCKING

Reproduction

- 1 - low
- 2 - medium
- 3 - high

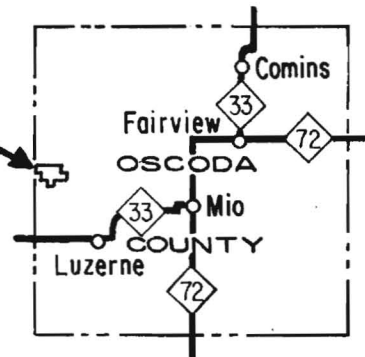
Pole Timber

- 4 - low
- 5 - medium
- 6 - high

NOT WARBLER HABITAT

MARGINAL HABITAT

WARBLER MONUMENT AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT



CRAPO LAKE KIRTLAND'S WARBLER MANAGEMENT AREA

Ostego County
T29N, R1W

Inventory Compartments:

Mackinac State Forest, Gaylord Area:	5	(Management Unit 1)
	7	(Management Unit 2)
	10	(Management Unit 3)

Area Description

- A. General location and background information: The Crapo Lake Kirtland's Warbler Management Area is immediately to the north of the Lovells Kirtland's Warbler Management Area. The occurrence of Grayling sand is relatively small in this Area. The strip of true Grayling sand is one to two and one-half miles wide running in generally a northwest to southeast direction. Much of this strip is surrounded by the slightly more fertile Graycalm and Rubicon sands. It is felt that with proper management these more fertile sands may produce habitat. Where Cutting Blocks were needed to yield the full complement of five Blocks, sites with these more fertile sands were included for warbler habitat management.
- Much of the Area has a high propensity for conversion to aspen. This aspen may need to be controlled through the use of silvicides and sites should be burned in the summer with a hot fire.
- B. Land ownership patterns: For the most part, the sites most suitable for potential nesting grounds are in state ownership. Management is not constrained by private ownership with the exception of caution needed when burning adjacent to private parcels.
- C. Status of other resources: A high tension electricity transmission line runs diagonally through the Area. Other than this specific use, other use is characterized by dispersed forms of forest recreation, such as hunting and berry picking.
- D. Kirtland's warbler occupancy history: Data are sparse from this Area. Records show, however, that 13 singing males were located here in 1961 and three in 1971.

CRAPO LAKE AREA

Ostego County

Management Unit 1. Y.O.E. --- 1

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1981	1	J6	56	77
		2	J1	12	46
		3	J5J3	39	15
		4	J2	17	17
		5	G		7
		6	J5 J2R2	42 27	38
		7	J6	43	<u>10</u>
TOTAL					210

Comments: Cut, burn, and regenerate to jack pine.

*2	1991	8	J1	22	4
		9	J2	46	48
		10	J5J3	49	137
		11	J6	← 68	47
		12	J2	23	4
		13	G		<u>4</u>
TOTAL					244

Comments: Cut, burn and regenerate to jack pine. Stand 11 should probably be harvested prior to 1991.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment¹</u>	<u>Acreage</u>
3	2001	14	J2	56	18
		15	J5J3	59	129
		16	J0		23
		18	J1	48	5
		19	J2	31	31
		20	J0		10
		21	J1	48	<u>31</u>
TOTAL					247

Comments: Cut, burn and regenerate to jack pine.

*4	2011	22	J1	48	22
		23	$\frac{J5}{J2R2}$	$\leftarrow \frac{72}{57}$	138
		24	J5J3	69	58
		25	J0		<u>22</u>
		TOTAL			

Comments: Cut, burn and regenerate to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2021	26	J2R2	← 71	69
		27	J5J3	← 79	49
		28	G		30
		29	<u>J4</u> J2	← <u>96</u> 58	13
		30	J5J3	← 79	4
		31	J2	52	59
		32	J0		<u>50</u>
				TOTAL	274

Comments: The indicated stands should be cut prior to 2021. The entire Block, however, must be cut and regenerated to jack pine in 2021.

Management Unit 2. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1983	1	J604	53	139
		2	J1	14	7
		3	J2	13	<u>19</u>
				TOTAL	165

Comments: Cut, burn hot (preferably in July or August) and regenerate to jack pine. If any aspen clones exist, these should be eliminated with Tordon, Amdon, or some other acceptable silvicide prior to cutting.

2	1993	8	J404	63	113
		9	O4J4	61	<u>48</u>
				TOTAL	161

Comments: Cut, burn hot (preferably in July or August) and regenerate to jack pine. If any aspen clones exist, these should be eliminated with Tordon, Amdon, or some other acceptable silvicide prior to cutting.

3	2003	4	J4J3	58	47
		5	J2	40	17
		6	J5	69	135
		7	G		<u>9</u>
				TOTAL	208

Comments: Cut, burn hot (preferably in July or August) and regenerate to jack pine. If any aspen clones exist, these should be eliminated with Tordon, Amdon, or some other acceptable silvicide prior to cutting.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*4	2013	10	J1	40	40
		11	<u>J404R4</u> J1R1	49 ← <u>79</u>	40
		12	J5	49 ← 79	56
		13	<u>J504</u> J101	57 ← <u>87</u> 42	18
		14	J1	46	12
		15	J2	57	24
		16	J1	48	7
		17	J504	44 ← 74	23
		18	<u>J404</u> J1	<u>61</u> 55	23
		19	<u>J504</u> J1	50 ← <u>80</u> 55	<u>28</u>
				TOTAL	271

Comments: The indicated stands should be cut as soon as possible to prevent timber loss. In 2013, cut, burn hot (preferably in July or August) and regenerate the entire Block to jack pine. If any aspen clones exist, these should be eliminated with Tordon, Amdon, or some other acceptable silvicide prior to cutting.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment¹</u>	<u>Acreage</u>
*5	2023	20	J1	50	188
		21	<u>J4</u> J2	<u>87</u> 70	17
		22	J3	71	15
		23	<u>J4</u> J2	<u>79</u> 60	11
		24	<u>J5</u> J2	<u>96</u> 69	<u>5</u>
				TOTAL	236

Comments: The indicated stands should be cut before 2023 to prevent timber loss. In 2013, cut, burn hot (preferably in July or August) and regenerate the entire Block to jack pine. Cutting Block 5 has only marginal potential of some day supporting Kirtland's warblers. It is essential that the aspen be controlled using Tordon, Amdon, or some other acceptable silvicide prior to cutting or burning.

Management Unit 3. Y.O.E. --- 5

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1985	1	J2	next rotation - age 62	46
		2	J0		35
		3	<u>J5</u> <u>J3</u>	<u>53</u> <u>32</u>	66
		4	J3	12	10
		5	J404	53	14
		6	<u>J5</u> <u>J2</u>	<u>47</u> <u>32</u>	6
		7	<u>O4R4</u> <u>J2</u>	<u>37</u> <u>22</u>	9
		8	J4J3	40	<u>9</u>
TOTAL					195

Comments: All of Cutting Block 1 is of marginal potential. Aspen is scattered throughout the Block. To prevent spread, the aspen must be killed with some acceptable silvicide such as Tordon or Amdon. Following the killing of the aspen, cut and burn the Block. This Block should be burned with a hot fire, preferably in July or August. Stand 1 was recently seeded to jack pine and may be spared treatment until next rotation. Stand 2 may present some prescribed burn problems, having recently been disced.

2	1995	9	<u>J4</u>	<u>60</u>	<u>126</u>
			J2	40	
TOTAL					126

Comments: Cut, burn (preferably hot in July or August) and regenerate to jack pine.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2005	10	<u>J4O4R4</u> J2	<u>60</u> 52	22
		11	J5O4 J1R1	← <u>72</u> 47	136
		12	J4R4O4	61	20
		13	J3	40	20
		14	R3J1	45	37
		15	<u>J4O4R4</u> J2	61	<u>54</u>
TOTAL					289

Comments: Cut, burn (preferably hot in July or August) and regenerate to jack pine. Treat the aspen with Tordon, Amdon or some other acceptable silvicide prior to cutting or burning.

*4	2015	16	<u>J4</u> J2	← <u>80</u> 60	63
		17	J2R1	68	51
		18	J0		26
		19	J5	← 77	11
		20	J6O4	← 88	<u>6</u>
TOTAL					157

Comments: Treat the aspen with Tordon, Amdon or some other acceptable silvicide prior to cutting or burning. In 2015, cut, burn and regenerate the entire Block to jack pine. The indicated stands may be harvested prior to 2015.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*5	2025	21	J0		36
		22	<u>J5</u> J3	← 93 ← 73	20
		23	R3J3	← 85	21
		24	J4R4O4	← 72	48
		25	<u>R4O4</u> J2	<u>62</u>	40
		26	J0		<u>17</u>
				TOTAL	182

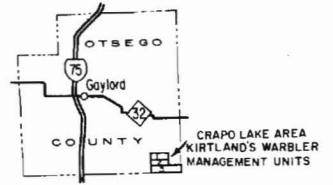
Comments: It is recommended that Stands 21 and 26 be regenerated soon. To prevent timber loss, the jack pine in the indicated stands should be cut prior to 2025. Since there is scattered aspen in this Block, an acceptable silvicide should be used to prevent its spread. In 2025, after killing the aspen, cut, burn, and regenerate the Block to jack pine. The prescribed burn should be hot and preferably carried out in July and August.

¹Where an age is not given for a specified type, that type occurs in insufficient quantity to be considered in the cutting schedule. An arrow (← ; →) points to an age at treatment other than a Y.O.E. scheduled age. These deviations in entry and other reasons for more immediate concern regarding a Cutting Block are flagged with an asterisk (*) in the margin next to the Cutting Block number.

CRAPO LAKE AREA KIRTLAND'S WARBLER MANAGEMENT UNITS

OTSEGO COUNTY, MICHIGAN
T29N, R1W

NOT WARBLER HABITAT
MARGINAL HABITAT
COMPARTMENT BOUNDARY



TYPE CLASSIFICATION

- J - Jack Pine
- R - Red Pine
- O - Oak - red, white or black
- G - Upland Grass

STAND SIZE and STOCKING

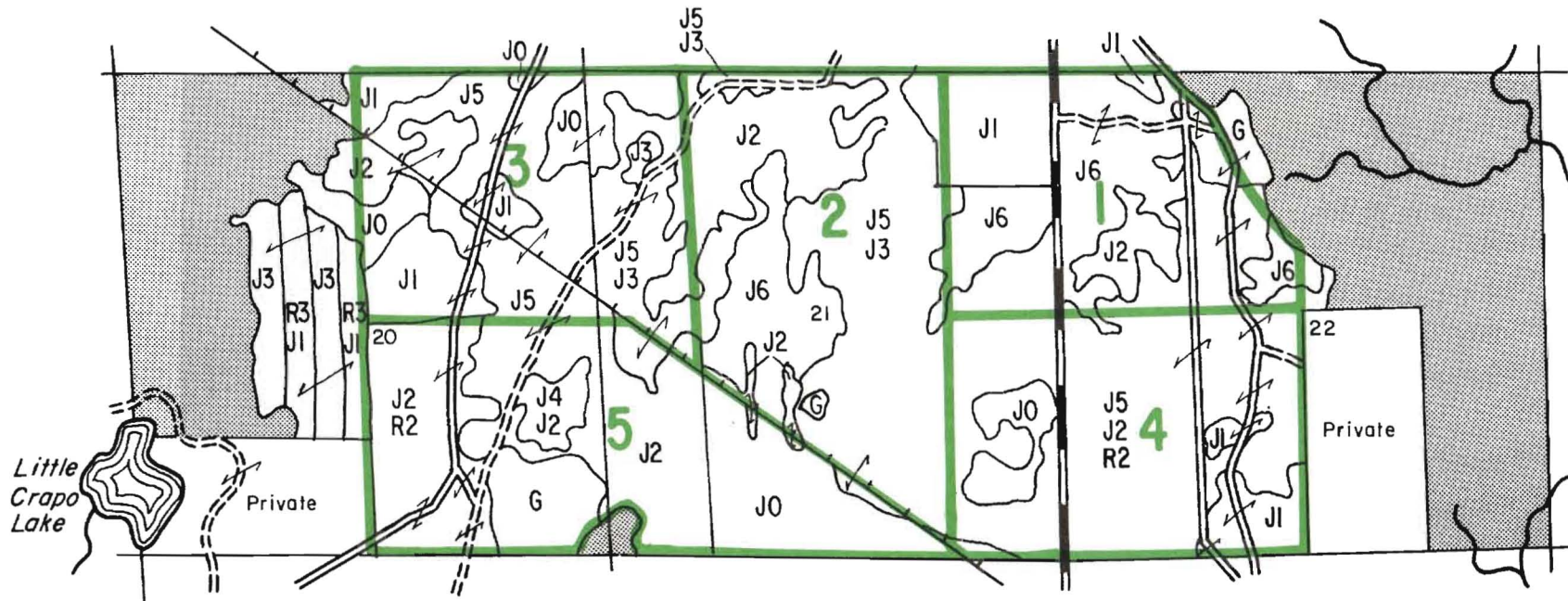
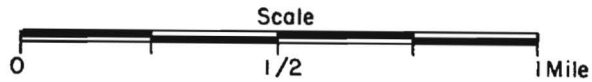
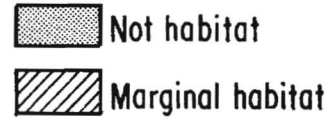
- Reproduction**
- 1 - low
 - 2 - medium
 - 3 - high
- Pole Timber**
- 4 - low
 - 5 - medium
 - 6 - high
- Saw Timber**
- 7 - low
 - 8 - medium
 - 9 - high

**CUTTING BLOCKS-
Compartment I**

**CRAPO LAKE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT**

(COMPARTMENT NO. 1)

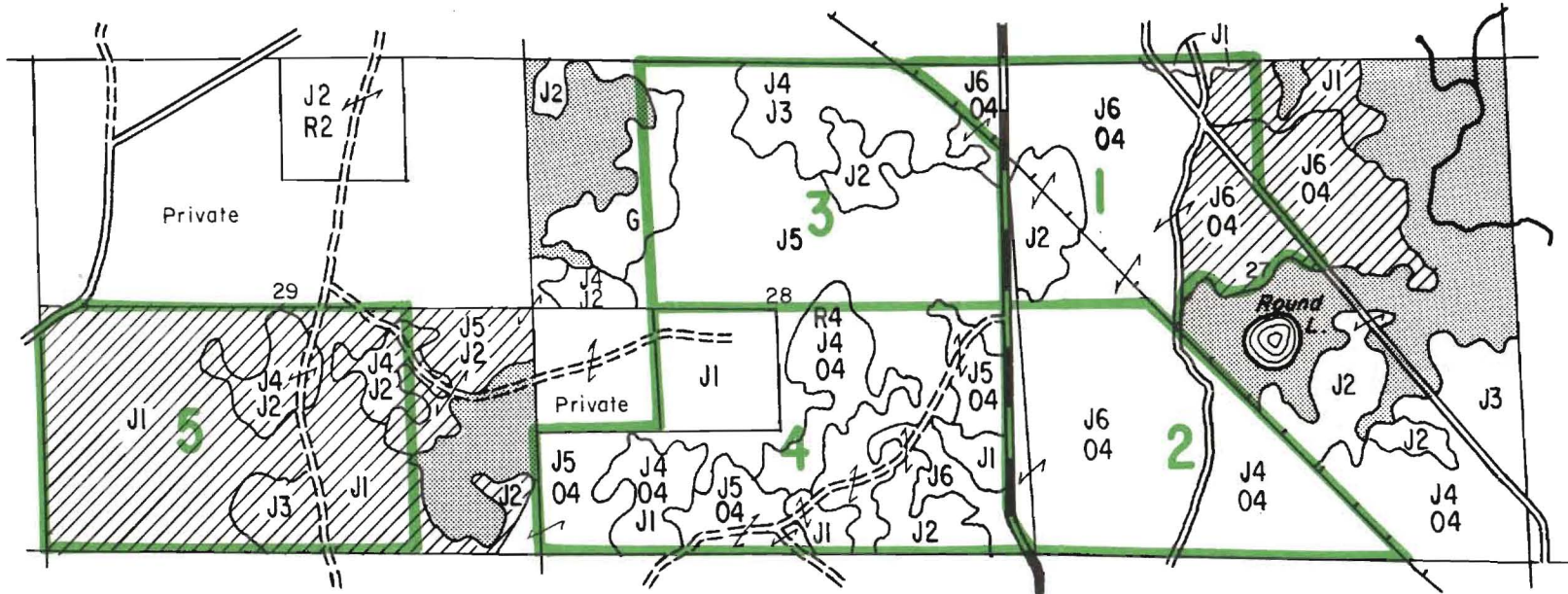
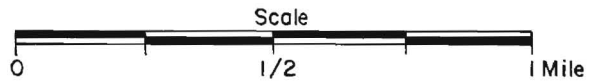
T29N, R1W.; OTSEGO CO., MICH.



CUTTING BLOCKS -
Compartment 2

CRAPO LAKE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT

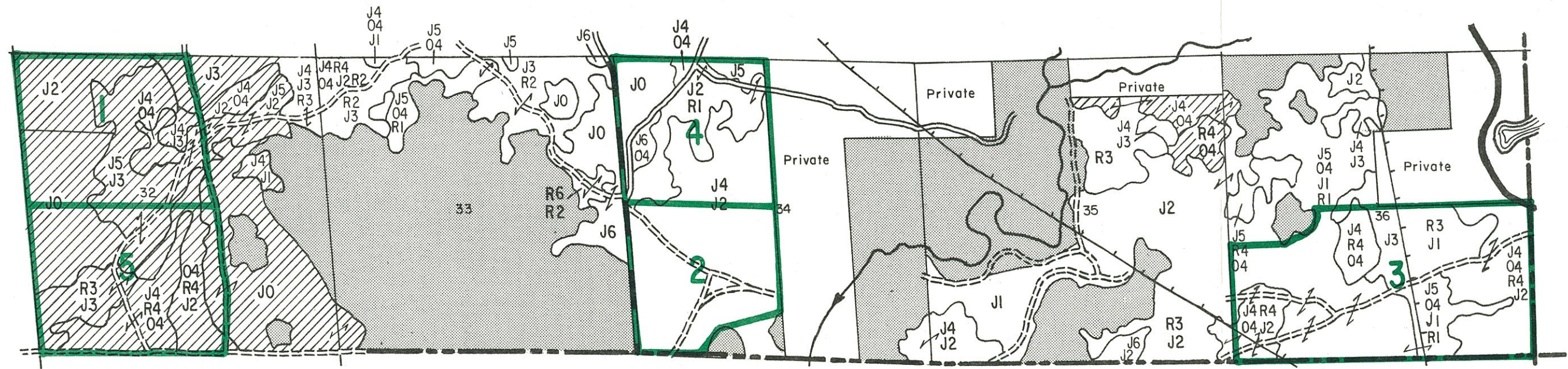
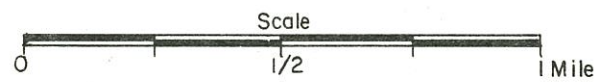
(COMPARTMENT NO. 2)
T29N, R1W ; OTSEGO CO., MICH



CRAPO LAKE AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO. 3)
T 29N, R1W ; OTSEGO CO., MICH.

Not habitat
Marginal habitat

CUTTING BLOCKS-
Compartment 3



ST. HELEN KIRTLAND'S WARBLER MANAGEMENT AREA

Roscommon County
T23N R1W

Inventory Compartments:

Au Sable State Forest, Roscommon Area	53	(Management Unit 1)
	51	(Management Unit 2)
	92	(Management Unit 3)

Area Description

- A. General location and background information: The St. Helen Kirtland's Warbler Management Area is located in east central Roscommon County to the north, east and south of the town of St. Helen. Adjacent to it on the east is the Ogemaw Refuge Kirtland's Warbler Management Area. The Cutting Blocks are by and large located on Grayling sand. Dividing the Area into two sub-areas are the lowlands of Marsh Creek and Cedar Creek. The Detroit and Mackinac railroad runs through Management Unit 3.
Management Unit 3 consists of only Cutting Blocks 3, 4, and 5.
- B. Land ownership patterns: Land ownership patterns in the St. Helen Kirtland's Warbler Management Area do not significantly constrain management.
- C. Status of other resources: Considerable development occurs in the St. Helen Area, primarily around Management Unit 3, due to the townsite of St. Helen. Most development is along St. Helen Trail and F-97. Due to the concentration of people and buildings, prescribed burning must be exercised with extreme caution.
The Midland to Mackinac Hiking Trail runs through Blocks 1, 2, 3 and 5 of Management Unit 2 and through Block 3 of Management Unit 3. This trail may need to be rerouted to prevent entry into warbler occupied territories.
Section 25 of T23N R1W is a recognized motor sport area. Off-road vehicle activity takes place not only in this section, but throughout the Area. Considerable enforcement efforts may be needed to protect habitat and/or nesting warblers.
The visual resource is especially important along F-97, a road well traveled by visitors, tourists, and locals.
- D. Kirtland's warbler occupancy history: Warblers have occupied at least the northern part of this Area nearly continually since the late 1940's. Much of this north part was very open during the 1950's and the birds utilized areas where jack pine was regenerating without fire. Much of this Area burned in the 1964 St. Helen fire. Warblers again began to occupy the Area in 1974.

ST. HELEN AREA

Roscommon County

Management Unit 1. Y.O.E. --- 9

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1979	1	<u>J5</u> J101	<u>59</u>	119
		2	J101	Overstory sold in 1978	73
		3	<u>J5</u> J3		14
		4	J2	21	<u>15</u>
TOTAL					221

Comments: A portion of the timber in this Block will be removed through a commercial sale in 1979. The remainder of the Block is to be sold to form a desirable size block for warbler habitat. Due to the presence of a relatively dense brush component, oak and occasional aspen, the entire Block must be burned hot. The aspen must be controlled, however. It is suggested that Tordon be used for this purpose and applied prior to the cutting of any aspen.

2	1989	5	<u>J4</u> J2	<u>55</u> 35	49
		6	J6	63	8
		7	J2	25	35
		8	G		78
		9	J6	58	50
		10	J5R4	58	7
		11	<u>J4</u> J2	<u>42</u>	<u>18</u>
TOTAL					245

Comments:

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	1999	12	J5R4	← 68	68
		13	J2	31	103
		14	$\frac{J4}{J2}$	← $\frac{52}{}$	<u>91</u>
TOTAL					262

Comments: The jack pine may be removed from the J5R4 stand prior to 1999. Also, the overstory may be removed from the J4/J2 stand.

*4	2009	15	J5R4	← 80	77
		16	J0	29	92
		17	J2	41	<u>34</u>
TOTAL					203

Comments: The jack pine may be removed from the J5R4 stand prior to 2009.

*5	2019	18	$\frac{J5}{J3}$	$\frac{38}{23} \leftarrow \frac{78}{63}$	49
		19	$\frac{J4}{J1}$	$\frac{23}{63} \leftarrow$	31
		20	J201U	4 ← 44	120
		21	G		<u>19</u>
TOTAL					219

Comments: The stands in Section 10 were cut in 1978. Black cherry, juneberry, oak, aspen and an occasional red maple are invading the site. The aspen must be killed to prevent its spread.

This Block will be lost to warbler potential if the brush is not controlled. Block 5 must be burned with a hot fire and regenerated to jack pine as soon as possible. The stands in Section 3 should be treated with those in Section 10.

This Block should therefore be treated at the same time as is Block 1. By treating and regenerating it soon, it will be available for re-entry again, on schedule, in 2019, with commercial size 40-year-old trees.

Management Unit 2. Y.O.E. --- 1

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
1	1981	1	J0	Already cut	126
		2	<u>J404</u> J2	<u>48</u> 33	136
		3	<u>J5</u> J1	<u>55</u>	<u>46</u>
				TOTAL	308

Comments: At present, the Midland-to-Mackinac Trail passes through this Block.

2	1991	4	J4R404	57	131
		5	J6	72	5
		6	<u>J4</u> J2	<u>42</u>	<u>60</u>
				TOTAL	196

Comments: This Block must be burned due to the abundance of oak, especially in te J5R404 stand. The Midland-to-Mackinac Hiking Trail runs through the middle of this Cutting Block at present.

3	2001	7	<u>J4</u> J2	<u>52</u>	174
		8	J2	33	<u>52</u>
				TOTAL	226

Comments: At present, the Midland-to-Mackinac Hiking Trail runs through the center of this Cutting Block. This Block should be burned.

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
4	2011	9	J2	43	254
		10	J2	37	12
		11	G		<u>8</u>
TOTAL					274

Comments: Burn Block following cutting. At present, the Midland-to-Mackinac Hiking Trail borders part of this Block.

5	2021	12	J2	47	200
		13	J2	53	16
		14	<u>J4</u> J1	<u>53</u>	92
		15	A3	53	8
		16	J2	53	<u>4</u>
TOTAL					320

Comments: Prior to cutting, the aspen must be killed to prevent its spread. Burn the Block following cutting. The Midland-to-Mackinac Hiking Trail passes through this Cutting Block.

Management Unit 3. Y.O.E. --- 3

<u>Cutting Block</u>	<u>Year of Entry</u>	<u>Stand Number</u>	<u>Current Type</u>	<u>Age at Time of Treatment</u> ¹	<u>Acreage</u>
*3	2003	1	<u>J404</u> J2	← <u>70</u> 55	179
		2	G		<u>14</u>
TOTAL					193

Comments: The older jack pine may be taken off prior to 2003. The entire Block, however, must be regenerated in 2003.

*4	2013	3	<u>J4</u> J2	<u>56</u> ← <u>91</u> 50	<u>160</u>
TOTAL					160

Comments: Remove the overstory in 1978 or 1979. Habitat may be immediately provided by the understory, if the overstory was removed.

*5	2023	4	<u>J4</u> J2	<u>56</u> ← <u>101</u> 60	120
		5	<u>J5</u> J2	56 ← <u>101</u> 60	<u>106</u>
TOTAL					226

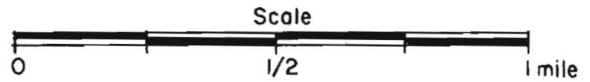
Comments: Remove the overstory in 1978 or 1979. Habitat may be immediately provided by the understory, if the overstory was removed.



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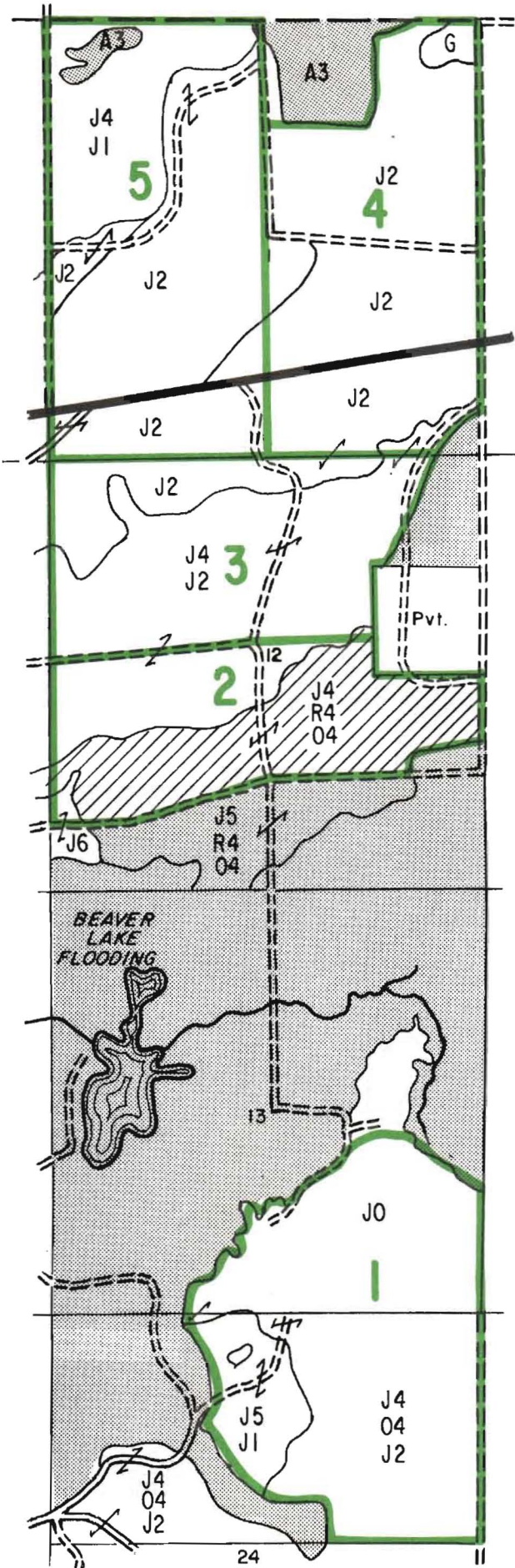
CUTTING BLOCKS-Compartment 2

ST. HELEN AREA
KIRTLAND'S WARBLER
MANAGEMENT UNIT
(COMPARTMENT NO.2)

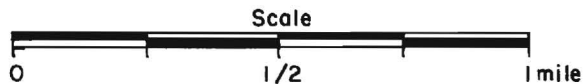
T23 N , RIW ; ROSCOMMON , CO. , MICH.



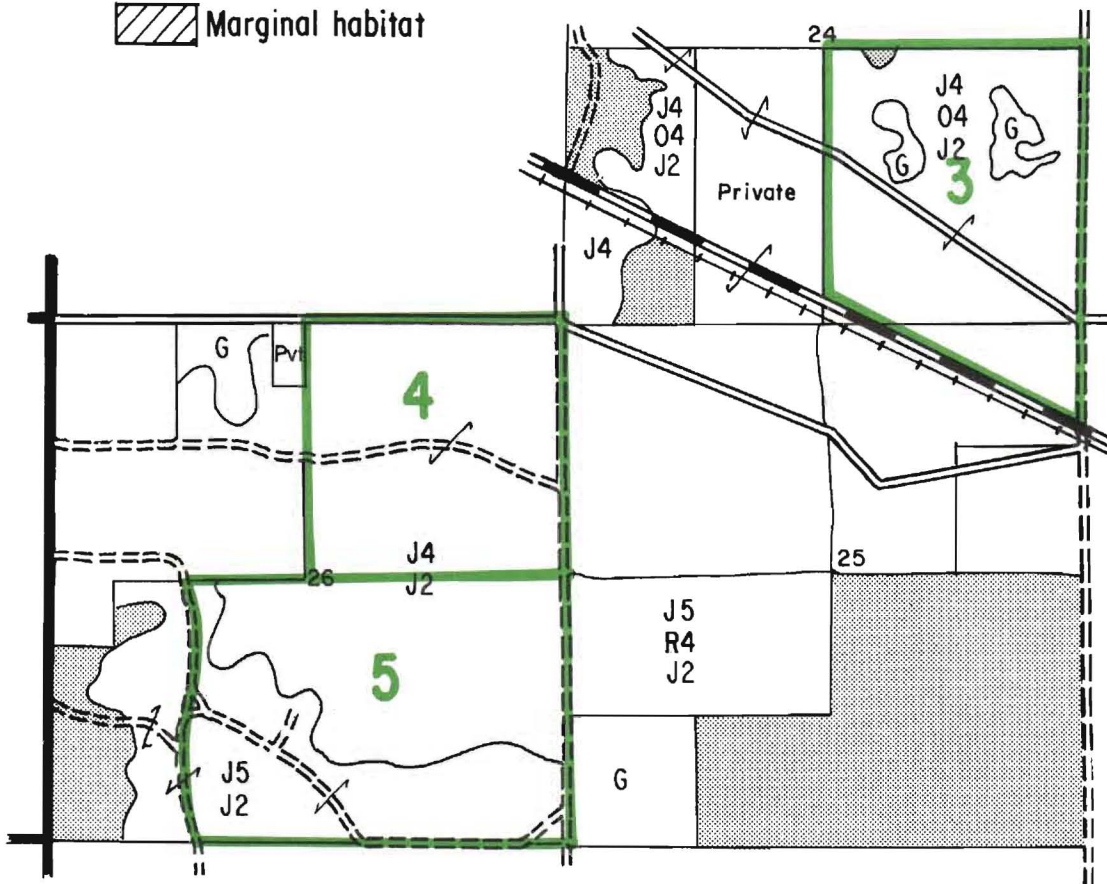
-  Not habitat
-  Marginal habitat



ST. HELEN AREA
KIRTLAND'S WARBLER MANAGEMENT UNIT
(COMPARTMENT NO. 3)
T23N, RIW ; ROSCOMMON CO. , MICH.



- Not habitat
- Marginal habitat



PLAN REVISION AND UPDATE

I. Introduction

The Kirtland's Warbler Habitat Management Plan is a guide. The cutting and treatment schedule has been designed to put warbler habitat management on an area regulation basis. The ages and densities of the present stands have been carefully considered to avoid as much loss in commercial pulpwood production as possible in the first rotation.

It is designed to provide, on a continuing basis, possible nesting habitat for the Kirtland's Warbler. If the schedule is followed, it will provide, in perpetuity, a continuous flow of suitable sized jack pine within each warbler Management Unit.

However, future changes in values, numbers of Kirtland's warblers, knowledge of nesting habitat requirements, management techniques, ownership patterns, and jack pine age distribution due to wildfire, jack pine budworm damage, windthrow and other unforeseeable occurrences, require flexibility in the Plan.

II. General Decennial Revision

The Plan is to undergo scrutiny for general revision every ten years. Each warbler Management Unit shall be examined for possible changes. The primary people responsible for review of the Plan are the biologist in charge of endangered species and, in the case of State Forest lands, the district planner. This revision should be carried out at the beginning of each decade, for example 1990, 2000, etc. In the case of the Forest Service, revision of this Plan should occur concurrent with the periodic revision of the Forest Land Management Plan.

III. Revision After Unplanned Changes in Management Units

The Plan is designed to provide a continuous supply of habitat suitable for nesting within each Management Unit. However, unforeseen circumstances are likely to interfere with the scheduled area regulation. Such circumstance may be wildfire, windthrow and insect damage. In order to keep the Plan functioning in an area regulation mode, it is essential that provision be made for bringing an affected Management Unit back to area regulation.

Listed below is a set of guidelines to be followed to achieve area regulation following some event which has caused the loss of area regulation.

1. The primary objective is to provide a continuous supply of habitat suitable for Kirtland's warbler nesting within each Management Unit.

2. Area regulation will be on a Management Unit basis.
3. The Management Unit(s) affected will be assigned a new treatment schedule within one (1) year of the event which caused a change in jack pine age distribution.
4. Any Management Unit which has at least one Cutting Block which has had an age class change in at least 30 percent of the Block must be considered for rescheduling.
5. Where more than one Management Unit is affected, the scheduling may involve the changing of existing Management Unit boundaries; however, such changes should be made only to prevent significant loss of a continuous supply of habitat or to prevent significant loss of timber, which might occur if the Unit boundaries were not changed.
6. Each Management Unit will contain five (5) Cutting Blocks where enough suitable potential habitat exists to afford five Blocks.
7. Cutting Blocks are to be 200 to 320 acres in size. Occasional exceptions are permitted in size if need be, but in no case will a Cutting Block be permitted to be less than eighty (80) acres.
8. Cutting Blocks are to be at least one-quarter (1/4) mile wide.
9. Cutting Blocks are not to be designed so as to have paved roads or heavily traveled gravel roads running through them.
10. As much as possible, boundaries of Cutting Blocks are to be natural (streams, lakes, non-habitat types) or follow easily recognizable man-made factors (survey section, quarter or eighth lines, roads).
11. Management Unit boundaries should not cross administrative unit boundaries.
12. Stands may be scheduled for cutting or treatment featuring either the overstory or understory with maximum timber production the determinant, within the framework of achieving the primary objective.
13. A Management Unit will be entered every ten (10) years with treatment being carried out in a new Cutting Block at each entry. When the full complement of five (5) Blocks has been entered, the first Block in the series will be re-entered.

14. In developing the cutting schedule, consider these social factors:
 - a. settlements; subdivisions
 - b. historic sites
 - c. recreational use
 - camp and picnic sites
 - Off-road vehicle (ORV) use
 - formal, informal
 - dedicated trails
 - d. mineral rights
 - e. oil and gas wells and rights-of-way
 - f. influence zones
 - g. special uses
15. Cutting Blocks are to be drawn so as to 1) maximize habitat over the long term, 2) provide a continuous supply of nestable-aged jack pine, and 3) maximize timber production given 1 and 2 above.
16. Maximization of timber production means striving to achieve, on a continuous basis, the greatest volume of timber in a forty-five (45) to fifty (50) year rotation.

(Federal Ownership)

KIRTLAND'S WARBLER
CRITICAL HABITAT IN MICHIGAN

<u>County</u>	<u>Management Area</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>	<u>Subsection</u>
Alcona	McKinley	26N	5E	6	N $\frac{1}{2}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$
				7	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$
				8	SE $\frac{1}{4}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$
				9	SW $\frac{1}{4}$ of SW $\frac{1}{4}$
				15	S $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$
				16	SW $\frac{1}{4}$ of NE $\frac{1}{4}$; NW $\frac{1}{4}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$; NW $\frac{1}{4}$
				17	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				18	E $\frac{1}{2}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				20	E $\frac{1}{2}$ of NE $\frac{1}{4}$; NW $\frac{1}{4}$ of NE $\frac{1}{4}$
				21	E $\frac{1}{2}$; NE $\frac{1}{4}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				22	W $\frac{1}{2}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$
				27	N $\frac{1}{2}$ of NW $\frac{1}{4}$
				28	N $\frac{1}{2}$ of NE $\frac{1}{4}$
				Alcona	McKinley
Alcona	Pine River	25N	7E	9	SE $\frac{1}{4}$ of SE $\frac{1}{4}$
				10	S $\frac{1}{2}$
				14	W $\frac{1}{2}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$
				15	ALL
				16	SE $\frac{1}{4}$
				20	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$; SE $\frac{1}{4}$ of NW $\frac{1}{4}$
				21	E $\frac{1}{2}$; SW $\frac{1}{4}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$
				22	ALL
				23	NW $\frac{1}{4}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$
				25	S $\frac{1}{2}$ of NE $\frac{1}{4}$; NW $\frac{1}{4}$ of NE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$
				26	ALL
				27	ALL
				28	N $\frac{1}{2}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; SE $\frac{1}{4}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$
				29	ALL
30	E $\frac{1}{2}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; S $\frac{1}{2}$ of SW $\frac{1}{4}$				
31	ALL				
32	E $\frac{1}{2}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$				
33	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$				
34	N $\frac{1}{2}$ of NE $\frac{1}{4}$; SW $\frac{1}{4}$ of NE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$				
35	N $\frac{1}{2}$ of NE $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; NW $\frac{1}{4}$ of NW $\frac{1}{4}$				
36	NW $\frac{1}{4}$ of NW $\frac{1}{4}$				

<u>County</u>	<u>Management Area</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>	<u>Subsection</u>
Crawford	Eldorado	25N	1W	8	E $\frac{1}{2}$ of SE $\frac{1}{4}$
				9	E $\frac{1}{2}$ of SE $\frac{1}{4}$; SE $\frac{1}{4}$ of SW $\frac{1}{4}$; W $\frac{1}{2}$ of SW $\frac{1}{4}$
				10	E $\frac{1}{2}$; SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$
				11	SW $\frac{1}{4}$ of NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				12	S $\frac{1}{2}$
				13	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				14	SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$
				15	ALL
				16	ALL
				17	E $\frac{1}{2}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$
				20	NE $\frac{1}{4}$; S $\frac{1}{2}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$
				21	SE $\frac{1}{4}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; S $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of NW $\frac{1}{4}$
				22	ALL
				23	NE $\frac{1}{4}$; SW $\frac{1}{4}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$; NW $\frac{1}{4}$
24	ALL				
29	W $\frac{1}{2}$ of NE $\frac{1}{4}$				
Crawford	Pere Cheney	25N	2W	4	E $\frac{1}{2}$
				9	E $\frac{1}{2}$; SW $\frac{1}{4}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$
				10	W $\frac{1}{2}$ of NE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
Crawford	Pere Cheney	26N	2W	27	W $\frac{1}{2}$ of SW $\frac{1}{4}$; SE $\frac{1}{4}$ of SW $\frac{1}{4}$; S $\frac{1}{2}$ of SE $\frac{1}{4}$
				28	SE $\frac{1}{4}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$
				33	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$
				34	NE $\frac{1}{4}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of NE $\frac{1}{4}$; N $\frac{1}{2}$ of NW $\frac{1}{4}$
Iosco	Pine River	24N	6E	1	E $\frac{1}{2}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$
				3	S $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$
				10	ALL
				12	NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$
				13	NE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				14	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$
Iosco	Pine River	24N	7E	1	NE $\frac{1}{4}$; SE $\frac{1}{4}$ of SW $\frac{1}{4}$; W $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				2	ALL
				3	ALL
				5	S $\frac{1}{2}$; W $\frac{1}{2}$ of NW $\frac{1}{4}$
				6	SE $\frac{1}{4}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$; NW $\frac{1}{4}$
				7	NE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; S $\frac{1}{2}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				8	E $\frac{1}{2}$; SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$
				9	NE $\frac{1}{4}$; W $\frac{1}{2}$
				10	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				11	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				12	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$
				17	N $\frac{1}{2}$ of NW $\frac{1}{4}$
				18	N $\frac{1}{2}$ of NE $\frac{1}{4}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$

County	Management Area	Township	Range	Section	Subsection		
Iosco	Tawas	22N	6E	12	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$		
				22N	7E	4	SW $\frac{1}{4}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$
						5	E $\frac{1}{2}$ of NE $\frac{1}{4}$; SW $\frac{1}{4}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$; SE $\frac{1}{4}$ of NW $\frac{1}{4}$
						7	S $\frac{1}{2}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; SW $\frac{1}{4}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$
Iosco	Tawas	23N	6E	7	E $\frac{1}{2}$ of SE $\frac{1}{4}$		
				8	S $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$		
				11	SE $\frac{1}{4}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$ of SE $\frac{1}{4}$		
				12	SW $\frac{1}{4}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$		
				15	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$		
				17	W $\frac{1}{2}$ of NE $\frac{1}{4}$; NW $\frac{1}{4}$		
				18	N $\frac{1}{2}$ of NE $\frac{1}{4}$		
				23	W $\frac{1}{2}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; SW $\frac{1}{4}$		
				24	W $\frac{1}{2}$ of SW $\frac{1}{4}$		
26	N $\frac{1}{2}$ of NE $\frac{1}{4}$; N $\frac{1}{2}$ of NW $\frac{1}{4}$						
Iosco	Tawas	23N	7E	1	W $\frac{1}{2}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$		
				2	W $\frac{1}{2}$		
				3	N $\frac{1}{2}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$ of NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$		
				10	W $\frac{1}{2}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$ of SW $\frac{1}{4}$; NE $\frac{1}{4}$ of SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$		
				12	NW $\frac{1}{4}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$		
				15	NW $\frac{1}{4}$		
				21	E $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$		
				22	SE $\frac{1}{4}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$; NW $\frac{1}{4}$		
				23	N $\frac{1}{2}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$		
				26	NW $\frac{1}{4}$ of NE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$		
				27	W $\frac{1}{2}$ of NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$		
				28	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$		
				29	NE $\frac{1}{4}$ of NE $\frac{1}{4}$		
				33	E $\frac{1}{2}$ of NE $\frac{1}{4}$; SW $\frac{1}{4}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; NE $\frac{1}{4}$ of SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$		
				34	NW $\frac{1}{4}$ of NE $\frac{1}{4}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$		
35	NW $\frac{1}{4}$						
Iosco	Tawas	23N	8E	1	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$		
				5	NW $\frac{1}{4}$ of SW $\frac{1}{4}$; W $\frac{1}{2}$ of NW $\frac{1}{4}$		
				6	NE $\frac{1}{4}$; NE $\frac{1}{4}$ of SE $\frac{1}{4}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$		
Iosco	Tawas	23N	9E	4	N $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$		
				5	E $\frac{1}{2}$; SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$		
				6	S $\frac{1}{2}$ of NE $\frac{1}{4}$; NW $\frac{1}{4}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$; NW $\frac{1}{4}$		
Iosco	Tawas	24N	7E	25	S $\frac{1}{2}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$		
				36	N $\frac{1}{2}$ of NE $\frac{1}{4}$		

<u>County</u>	<u>Management Area</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>	<u>Subsection</u>
Iosco	Tawas	24N	8E	30	SW $\frac{1}{4}$ of SW $\frac{1}{4}$
				31	SW $\frac{1}{4}$ of SE $\frac{1}{4}$; SE $\frac{1}{4}$ of SW $\frac{1}{4}$; W $\frac{1}{2}$ of NW $\frac{1}{4}$
Oscoda	Big Creek	25N	1E	10	S $\frac{1}{2}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; SW $\frac{1}{4}$; SE $\frac{1}{4}$ of NW $\frac{1}{4}$
				11	E $\frac{1}{2}$ of NE $\frac{1}{4}$; SW $\frac{1}{4}$ of NE $\frac{1}{4}$; NE $\frac{1}{4}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$
				12	S $\frac{1}{2}$ of SE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; SW $\frac{1}{4}$; NW $\frac{1}{4}$
				13	ALL
				14	NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; S $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$
				15	E $\frac{1}{2}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$
				22	NW $\frac{1}{4}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$ of NE $\frac{1}{4}$; NE $\frac{1}{4}$ of SE $\frac{1}{4}$
				23	ALL
				24	ALL
				25	ALL
				26	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; NE $\frac{1}{4}$ of NW $\frac{1}{4}$
				27	SE $\frac{1}{4}$ of SE $\frac{1}{4}$
				34	E $\frac{1}{2}$; SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; NW $\frac{1}{4}$ of NW $\frac{1}{4}$
				36	NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
Oscoda	Big Creek	25N	2E	17	SW $\frac{1}{4}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$
				18	ALL
				19	ALL
				20	NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; W $\frac{1}{2}$
				28	E $\frac{1}{2}$; SW $\frac{1}{4}$; N $\frac{1}{2}$ of NW $\frac{1}{4}$
				30	ALL
				32	E $\frac{1}{2}$ of NE $\frac{1}{4}$; SW $\frac{1}{4}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$
33	W $\frac{1}{2}$ of SW $\frac{1}{4}$				
Oscoda	Mack Lake	25N	2E	11	S $\frac{1}{2}$ of NE $\frac{1}{4}$; SE $\frac{1}{4}$; NE $\frac{1}{4}$ of SW $\frac{1}{4}$; W $\frac{1}{2}$ of SW $\frac{1}{4}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$
				12	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; SW $\frac{1}{4}$ of SW $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; SW $\frac{1}{4}$ of NW $\frac{1}{4}$
Oscoda	Mack Lake	25N	3E	1	ALL
				2	ALL
				3	ALL
				4	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				5	N $\frac{1}{2}$
				7	SE $\frac{1}{4}$ of NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$
				8	SE $\frac{1}{4}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; NW $\frac{1}{4}$
				9	SW $\frac{1}{4}$ of NW $\frac{1}{4}$
				10	NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$
				11	ALL
				12	ALL
				13	NE $\frac{1}{4}$; E $\frac{1}{2}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of NW $\frac{1}{4}$
				14	ALL
				15	ALL
				16	ALL

<u>County</u>	<u>Management Area</u>	<u>Township</u>	<u>Range</u>	<u>Section</u>	<u>Subsection</u>				
Oscoda	Mack Lake	25N	3E	20	E $\frac{1}{2}$; NW $\frac{1}{4}$				
				21	ALL				
				22	ALL				
				23	NE $\frac{1}{4}$; NE $\frac{1}{4}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of NW $\frac{1}{4}$				
				28	E $\frac{1}{2}$; NW $\frac{1}{4}$				
				29	NE $\frac{1}{4}$; NE $\frac{1}{4}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$; NW $\frac{1}{4}$				
Oscoda	Mack Lake	25N	4E	6	ALL				
				7	NW $\frac{1}{4}$ of SW $\frac{1}{4}$; W $\frac{1}{2}$ of NW $\frac{1}{4}$				
				18	SE $\frac{1}{4}$; S $\frac{1}{2}$ of SW $\frac{1}{4}$				
				19	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$				
Oscoda	McKinley	26N	3E	1	NE $\frac{1}{4}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$; SE $\frac{1}{4}$ of NW $\frac{1}{4}$; W $\frac{1}{2}$ of NW $\frac{1}{4}$				
				2	W $\frac{1}{2}$				
				3	S $\frac{1}{2}$; NW $\frac{1}{4}$				
				4	NE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$				
				5	NE $\frac{1}{4}$; NW $\frac{1}{4}$ of SE $\frac{1}{4}$; NE $\frac{1}{4}$ of SW $\frac{1}{4}$				
Oscoda	McKinley	26N	4E	1	S $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of NW $\frac{1}{4}$				
				2	SW $\frac{1}{4}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$; S $\frac{1}{2}$ of NW $\frac{1}{4}$; NW $\frac{1}{4}$ of NW $\frac{1}{4}$				
				3	ALL				
				6	W $\frac{1}{2}$ of SW $\frac{1}{4}$; W $\frac{1}{2}$ of NW $\frac{1}{4}$				
				7	NW $\frac{1}{4}$ of NW $\frac{1}{4}$				
				8	NE $\frac{1}{4}$ of NE $\frac{1}{4}$				
				9	N $\frac{1}{2}$				
				10	N $\frac{1}{2}$				
				11	ALL				
				12	SE $\frac{1}{4}$ of NE $\frac{1}{4}$; W $\frac{1}{2}$ of NE $\frac{1}{4}$; S $\frac{1}{2}$; NW $\frac{1}{4}$				
				13	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; N $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$				
				14	NE $\frac{1}{4}$; N $\frac{1}{2}$ of SE $\frac{1}{4}$; E $\frac{1}{2}$ of NW $\frac{1}{4}$; NW $\frac{1}{4}$ of NW $\frac{1}{4}$				
				Oscoda	McKinley	27N	4E	25	E $\frac{1}{2}$; E $\frac{1}{2}$ of SW $\frac{1}{4}$; NW $\frac{1}{4}$ of SW $\frac{1}{4}$; SE $\frac{1}{4}$ of NW $\frac{1}{4}$
								36	ALL

DESIRABLE HABITAT FOR ACQUISITION

Attempts will be made to purchase the following private land inholdings within critical habitat provided owners wish to sell, funds are available for such purchases, and the parcels can be obtained at fair market value. No condemnation proceedings are envisioned.

A. STATE LIST

<u>County</u>	<u>Management Area</u>	<u>Description</u>	<u>Acres</u>
Clare	Leota	T20N R5W, Sec 3 SW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Clare	Leota	T20N R5W, Sec 3 NW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Clare	Leota	T20N R5W, Sec 6 SW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Clare	Leota	T20N R5W, Sec 6 NW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Clare	Leota	T20N R5W, Sec 9 NE $\frac{1}{4}$	160
Clare	Leota	T20N R5W, Sec 17 SE $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Clare	Leota	T20N R5W, Sec 18 NW $\frac{1}{4}$	160
Clare	Leota	T20N R5W, Sec 22 NW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Clare	Leota	T20N R5W, Sec 30 E $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Clare	Leota	T20N R5W, Sec 30 SW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Clare	Leota	T20N R5W, Sec 30 NW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Clare	Leota	T20N R6W, Sec 13 E $\frac{1}{2}$ of SE $\frac{1}{4}$	80
Clare	Leota	T20N R6W, Sec 13 SW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Clare	Leota	T20N R6W, Sec 14 SE $\frac{1}{4}$	160
Clare	Leota	T20N R6W, Sec 23 NE $\frac{1}{4}$	160
Clare	Leota	T20N R6W, Sec 23 E $\frac{1}{2}$ of SE $\frac{1}{4}$	80
Clare	Leota	T20N R6W, Sec 23 E $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Clare	Leota	T20N R6W, Sec 24 NW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Clare	Leota	T20N R6W, Sec 35 SW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Clare	Leota	T20N R6W, Sec 35 SE $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Clare	Leota	T20N R6W, Sec 35 NE $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Clare	Leota	T20N R6W, Sec 35 NW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Crawford	Lovells	T28N R1W, Sec 13 NW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Crawford	North Branch	T27N R1W, Sec 28 NW $\frac{1}{4}$	160
Crawford	Pere Cheney	T25N R2W, Sec 5 NW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Crawford	Pere Cheney	T25N R2W, Sec 6 N $\frac{1}{2}$ of SE $\frac{1}{4}$	80
Crawford	Pere Cheney	T25N R2W, Sec 6 SE $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Crawford	Pere Cheney	T25N R3W, Sec 1 SW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Crawford	Pere Cheney	T25N R3W, Sec 1 NW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Crawford	Pere Cheney	T25N R3W, Sec 1 N $\frac{1}{2}$ of SW $\frac{1}{4}$ of SW $\frac{1}{4}$	20
Crawford	Pere Cheney	T26N R2W, Sec 32 NE $\frac{1}{4}$	160
Crawford	Pere Cheney	T26N R2W, Sec 32 SE $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Crawford	Staley Lake	T26N R3W, Sec 1 SW $\frac{1}{4}$	160
Crawford	Staley Lake	T26N R3W, Sec 34 SE $\frac{1}{4}$	160
Kalkaska	Fletcher Road	T25N R5W, Sec 22 E $\frac{1}{2}$ of SE $\frac{1}{4}$	80
Kalkaska	Sharon	T25N R6W, Sec 8 SW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Kalkaska	Sharon	T26N R6W, Sec 35 SE $\frac{1}{4}$	160
Montmorency	(Clear Lake- (Tomahawk Creek	T32N R2E, Sec 12 NW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Ogemaw	Damon	T23N R2E, Sec 6 SW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Ogemaw	Damon	T24N R1E, Sec 1 NE $\frac{1}{4}$	160
Ogemaw	Damon	T24N R1E, Sec 3 N $\frac{1}{2}$	320
Ogemaw	Damon	T24N R1E, Sec 3 SW $\frac{1}{4}$	160
Ogemaw	Damon	T24N R1E, Sec 5 N $\frac{1}{2}$ of SE $\frac{1}{4}$	80

<u>County</u>	<u>Management Area</u>	<u>Description</u>	<u>Acres</u>
Ogemaw	Damon	T24N R1E, Sec 5 SW $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Ogemaw	Damon	T24N R1E, Sec 13 N $\frac{1}{2}$ of NE $\frac{1}{4}$	80
Ogemaw	Damon	T24N R1E, Sec 14 NW $\frac{1}{4}$	160
Ogemaw	Damon	T24N R1E, Sec 14 SW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Ogemaw	Damon	T24N R1E, Sec 15 N $\frac{1}{2}$ of N $\frac{1}{2}$ of SW $\frac{1}{4}$	40
Ogemaw	Damon	T24N R1E, Sec 17 NW $\frac{1}{4}$	160
Ogemaw	Damon	T24N R1E, Sec 17 SE $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Ogemaw	Damon	T24N R1E, Sec 18 N $\frac{1}{2}$ of NE $\frac{1}{4}$	80
Ogemaw	Damon	T24N R1E, Sec 20 E $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Ogemaw	Damon	T24N R1E, Sec 26 NW $\frac{1}{4}$	160
Ogemaw	Damon	T24N R1E, Sec 34 NW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Ogemaw	Damon	T24N R1E, Sec 34 N $\frac{1}{2}$ of SW $\frac{1}{4}$ of NE $\frac{1}{4}$	20
Ogemaw	Damon	T24N R1E, Sec 35 NW $\frac{1}{4}$	160
Ogemaw	Damon	T24N R1E, Sec 36 S $\frac{1}{2}$ of NE $\frac{1}{4}$	80
Ogemaw	Damon	T24N R2E, Sec 3 SW $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Ogemaw	Damon	T24N R2E, Sec 3 SW $\frac{1}{4}$	160
Ogemaw	Damon	T24N R2E, Sec 6 E $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Ogemaw	Damon	T24N R2E, Sec 18 S $\frac{1}{2}$ of NE $\frac{1}{4}$	80
Ogemaw	Damon	T24N R2E, Sec 18 SE $\frac{1}{4}$	160
Ogemaw	Damon	T24N R2E, Sec 29 W $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Ogemaw	Damon	T24N R2E, Sec 30 NE $\frac{1}{4}$	160
Ogemaw	Damon	T24N R2E, Sec 31 NE $\frac{1}{4}$	160
Ogemaw	Damon	T24N R2E, Sec 31 E $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Ogemaw	Damon	T24N R2E, Sec 32 SE $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Ogemaw	Ogemaw Refuge	T23N R1E, Sec 17 SE $\frac{1}{4}$	160
Ogemaw	Ogemaw Refuge	T23N R1E, Sec 19 NW $\frac{1}{4}$	160
Ogemaw	Ogemaw Refuge	T23N R1E, Sec 20 NW $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Ogemaw	Ogemaw Refuge	T23N R1E, Sec 20 W $\frac{1}{2}$ of SE $\frac{1}{4}$	80
Ogemaw	Ogemaw Refuge	T23N R1E, Sec 29 E $\frac{1}{2}$ of SW $\frac{1}{4}$	80
Ogemaw	Ogemaw Refuge	T23N R1E, Sec 32 NE $\frac{1}{4}$ of NE $\frac{1}{4}$ - part	21
Oscoda	Big Creek	T27N R1E, Sec 5 NW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Oscoda	Big Creek	T27N R1E, Sec 6 W $\frac{1}{2}$	260
Oscoda	Big Creek	T27N R1E, Sec 7 NW $\frac{1}{4}$	160
Oscoda	Big Creek	T28N R1E, Sec 18 SW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Oscoda	Big Creek	T28N R1E, Sec 29 SW $\frac{1}{4}$ of SW $\frac{1}{4}$ - part	14
Oscoda	Big Creek	T28N R1E, Sec 30 SE $\frac{1}{4}$ of SE $\frac{1}{4}$ & part of NE $\frac{1}{4}$ of SE $\frac{1}{4}$	46
Oscoda	Big Creek	T28N R1E, Sec 31 SE $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Oscoda	Big Creek	T28N R1E, Sec 31 NE $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Oscoda	Muskrat Lake	T27N R1E, Sec 13 SW $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Oscoda	Muskrat Lake	T27N R1E, Sec 23 E $\frac{1}{2}$ of SW $\frac{1}{4}$	80
Oscoda	Muskrat Lake	T27N R1E, Sec 23 NE $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Oscoda	Warbler Monument	T26N R1E, Sec 5 N $\frac{1}{2}$ of NE $\frac{1}{4}$	80
Oscoda	Warbler Monument	T27N R1E, Sec 31 E $\frac{1}{2}$ of SW $\frac{1}{4}$	80
Oscoda	Warbler Monument	T27N R1E, Sec 31 SE $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Oscoda	Warbler Monument	T27N R1E, Sec 32 SW $\frac{1}{4}$	160
Otsego	Crapo Lake	T29N R1W, Sec 16 E $\frac{1}{2}$ of SW $\frac{1}{4}$	80
Roscommon	St. Helen	T23N R1W, Sec 24 E $\frac{1}{2}$ of SW $\frac{1}{4}$	80

TOTAL 7,661

B. FEDERAL LIST

<u>County</u>	<u>Management Area</u>	<u>Description</u>	<u>Acres</u>
Alcona	McKinley	T26N R5E, Sec 21 W $\frac{1}{2}$ of SW $\frac{1}{4}$	80
Alcona	McKinley	T26N R5E, Sec 21 SE $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Alcona	McKinley	T26N R5E, Sec 28 W $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Alcona	McKinley	T26N R5E, Sec 28 SW $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Alcona	McKinley	T27N R5E, Sec 31 SW $\frac{1}{4}$ of NW $\frac{1}{4}$	42
Crawford	Eldorado	T25N R1W, Sec 11 E $\frac{1}{2}$ of SW $\frac{1}{4}$	80
Crawford	Pere Cheney	T25N R2W, Sec 16 N $\frac{1}{2}$ of NE $\frac{1}{4}$	80
Crawford	Pere Cheney	T26N R2W, Sec 34 SW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Iosco	Tawas	T22N R7E, Sec 4 SE $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Iosco	Tawas	T22N R7E, Sec 4 NE $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Iosco	Tawas	T23N R6E, Sec 12 SW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Iosco	Tawas	T23N R7E, Sec 10 SE $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Oscoda	Big Creek	T25N R1E, Sec 11 SE $\frac{1}{4}$ of SE $\frac{1}{4}$	40
Oscoda	Big Creek	T25N R1E, Sec 11 SE $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Oscoda	Big Creek	T25N R1E, Sec 26 SE $\frac{1}{4}$ of NW $\frac{1}{4}$	40
Oscoda	Big Creek	T25N R2E, Sec 20 W $\frac{1}{2}$ of SE $\frac{1}{4}$	80
Oscoda	Big Creek	T25N R2E, Sec 32 N $\frac{1}{2}$ of NW $\frac{1}{4}$	80
Oscoda	Mack Lake	T25N R3E, Sec 4 NW $\frac{1}{4}$ of SW $\frac{1}{4}$	40
Oscoda	Mack Lake	T25N R3E, Sec 4 Lot 2	35
Oscoda	Mack Lake	T25N R3E, Sec 5 S $\frac{1}{2}$	320
Oscoda	Mack Lake	T25N R3E, Sec 8 SW $\frac{1}{4}$	150
Oscoda	McKinley	T26N R3E, Sec 2 N $\frac{1}{2}$ of SE $\frac{1}{4}$	80
Oscoda	McKinley	T26N R3E, Sec 3 W $\frac{1}{2}$ of NE $\frac{1}{4}$	80
Oscoda	McKinley	T26N R3E, Sec 3 NE $\frac{1}{4}$ of NE $\frac{1}{4}$	40
Oscoda	McKinley	T26N R3E, Sec 3 W $\frac{1}{2}$ of SE $\frac{1}{4}$ of NE $\frac{1}{4}$	20
Oscoda	McKinley	T26N R3E, Sec 12 N $\frac{1}{2}$ of N $\frac{1}{2}$	160

TOTAL----- 1,807 Acres