

United States  
Department of  
Agriculture

Forest  
Service

FSL

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*Becky PK*  
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Reply To: 4200

Date: September 20, 1989

**SEP 25 1989**

Subject: Kirtland's Warbler Habitat

To: Forest Supervisor  
Huron-Manistee National Forest

The Kirtland's Warbler population did not show the expected increase in 1989 that was predicted from the maturation of both wildfire and managed habitat. Thus, we must reject the hypothesis that habitat age and quantity can account for population response every year. Apparently, we must monitor abiotic factors for annual predictions. For example last year's failure of the blueberry crop and extremely dry weather in the Bahamas may have been an unusual event arresting population growth. (1977 was another year that went against a 7-year upward trend.) Nevertheless, available evidence suggests that breeding habitat is still the most useful predictor of KW population over many years (see enclosed graphs).

The value of managed habitat was discussed in this context at the June Recovery Team Meeting. Since that meeting's discussion, I compared the proportion of both KW males and suitably-aged habitat acres in wildfire versus plantation habitat. The results were close to 20 percent of both birds and habitat in the plantations, despite a habitat-age bias against managed habitat. I know of a minimum of 19 planting blocks that have been used by KWs, but 14 are still occupied (many are recently colonized), so their relative value is undetermined at this time.

I have enclosed a copy of the NCFES habitat management recommendations for Kirtland's Warbler which were published as part of a SAF Proceedings last year. Sue Lietz has reprinted the recommendations (only) in larger type for "weak eyes?" distribution to the Huron districts. We will continue to focus much of our research on plantation utilization and habitat quality as an important part of our joint research - management efforts on Open Lands and Old Growth.

Thank you for your interest and cooperation.

*Paul PE Bill BJ*  
*This points to the need to "perfect" the burning of the test plots -*

JOHN R. PROBST  
Research Wildlife Ecologist

Enclosures

cc: Harrisville RD  
Mio RD  
Tawas RD

*N*  
S  
M  
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P  
A  
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1  
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NO. KW MALES

250  
240  
230  
220  
210  
200  
190  
180  
170  
160

NO. OF MALE KW'S

0-12  
13-24  
25-36  
37-48  
> 48

LUZERNE

ARTILLERY SOUTH

MACK LAKE R.P.

OGEMAW MGMT.

PERE CHENEY

LOVELLS NORTH

MUSKRAT LAKE

ARTILLERY NORTH

DAMON BURN

FLETCHER BURN

MACK LAKE MGMT.

MCKINLEY N.R.

BALD HILL BURN

MCKINLEY PLINT.

MACK LAKE BURN

YEAR

1971

1972

1973

1974

1975

1976

1977

1978

1979

1980

1981

1982

1983

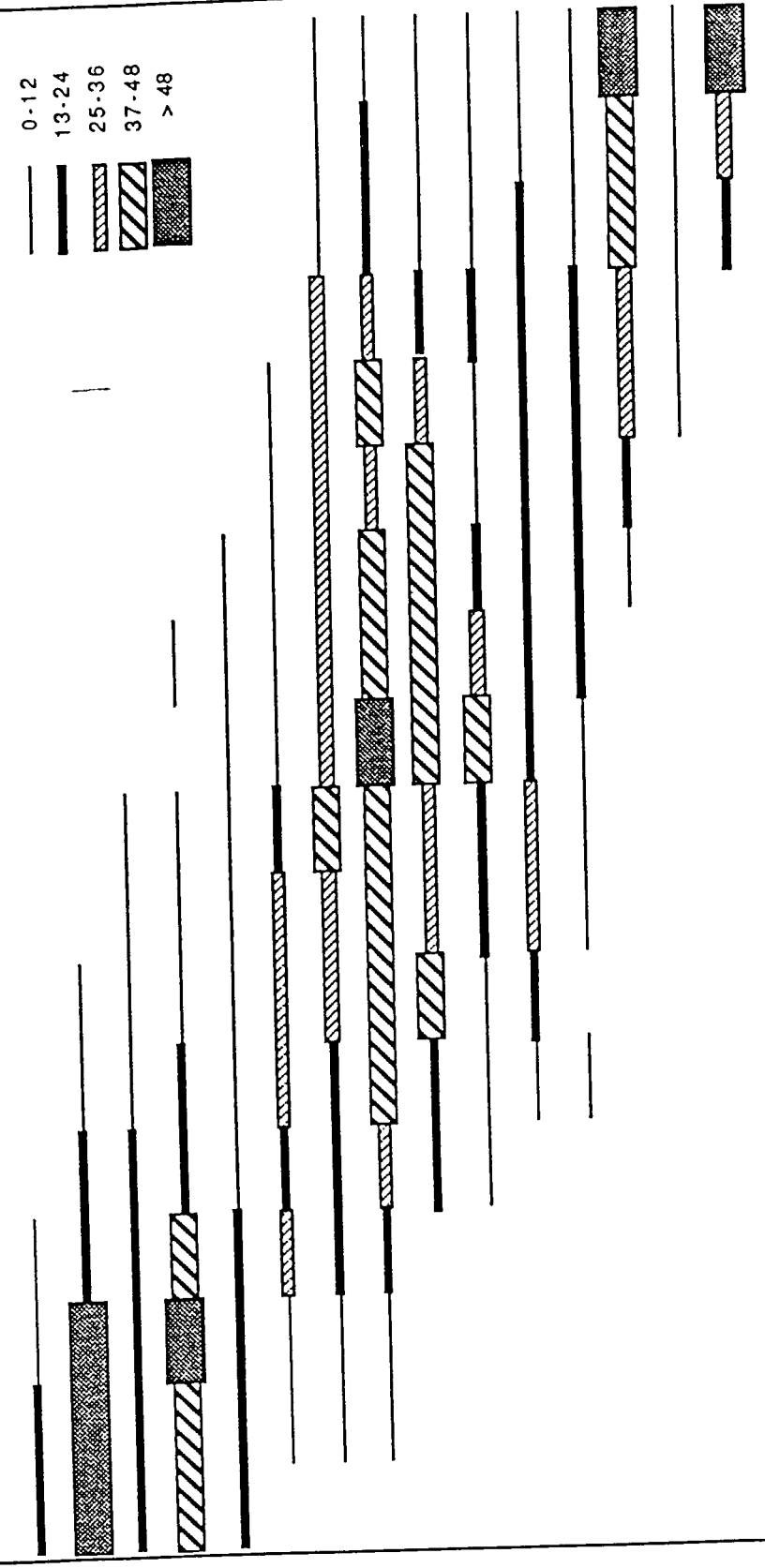
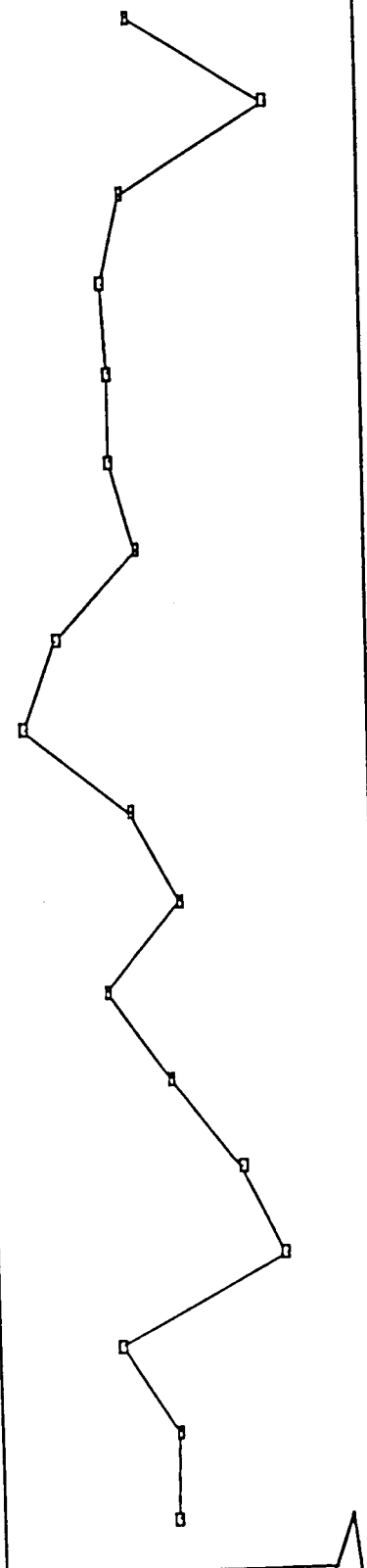
1984

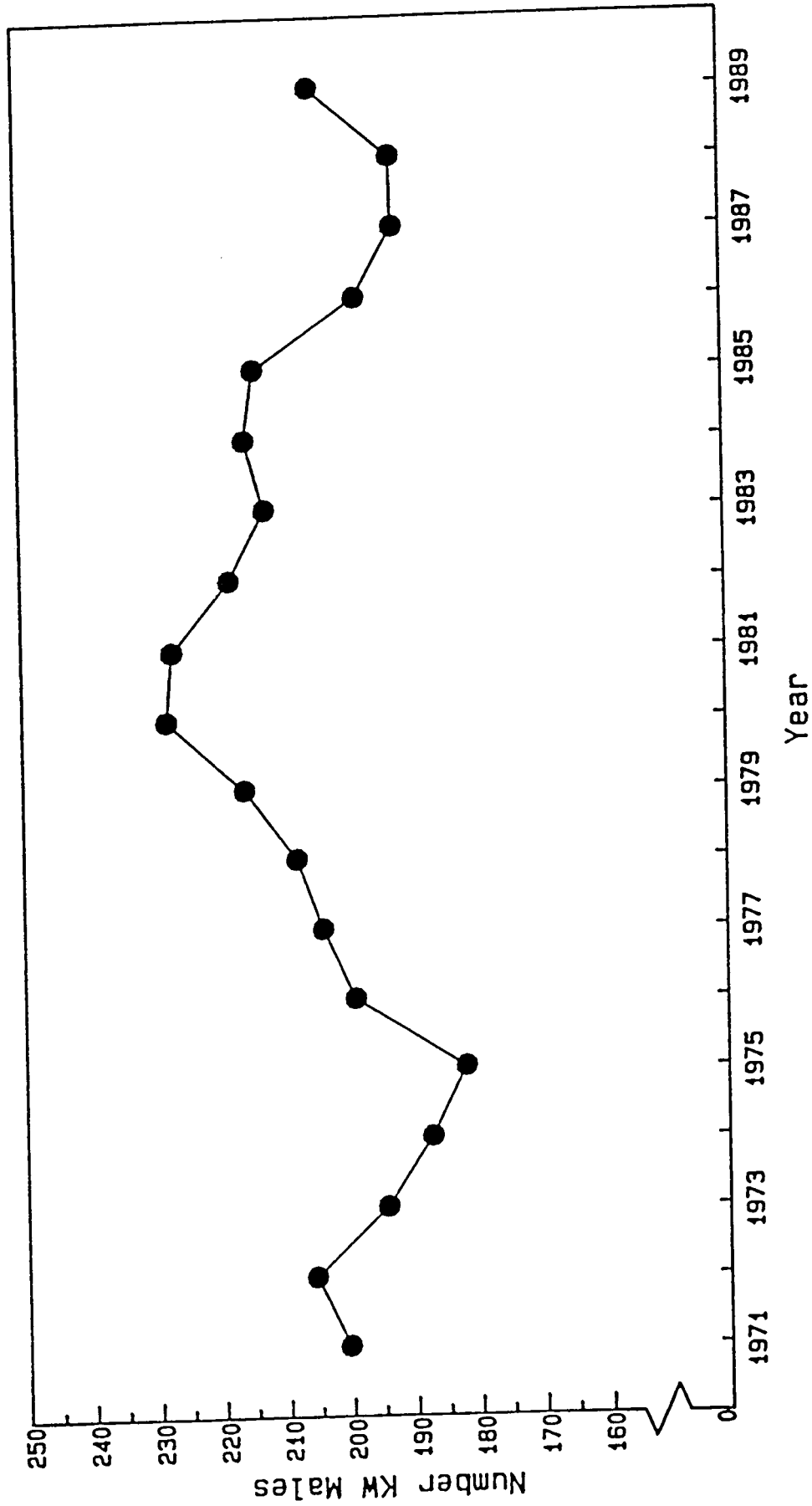
1985

1986

1987

1988





## I. Landscape Design of Management Areas

- A. 1. Kirtland's warblers colonize taller and denser jack pine patches before they occupy habitat with shorter or less dense trees.
2. It is possible to extend the period of Kirtland's warbler occupancy in a management area by several methods such as varying the timing of stand regeneration or the tree spacing in a plantation.
- B. 1. The date of origin between cutting blocks should differ by about 5 years. Temporal overlap should make it less necessary to maintain populations by long-distance recolonization.
2. a. Site quality variability within a stand or unit can increase the period of occupancy by Kirtland's warblers because it creates a pattern of patches with varied foliage volume. Managers should be aware of the importance of this variety when scheduling planting or prescribing tree densities.
- b. Tree densities should be more uniform in areas with site variety because differences in height growth alone may provide the necessary variety in foliage volume without requiring tree stocking differences.
3. Avoid long, narrow stands to minimize edge effects of predation.

## II. Improving Local Habitat Quality

- A. 1. Most recommendations for improving Kirtland's warbler habitat center about increasing natural regeneration and optimizing tree spacing in plantations.
2. Kirtland's warblers do not commonly colonize a stand until tree canopy cover exceeds 20 percent.
3. Jack pine areas with 20 to 60 percent canopy cover have more than 1,100 stems per acre in plantations. However, plantations should have about 2,000 stems per acre to attract colonists at the earliest possible stand age.

B. Duration of Stand Occupancy. The following seven alternatives are suggested to extend the length of stand occupancy:

1. a. Plantations with a variety of tree densities should attract Kirtland's warbler colonists both early and late in stand life.
- b. Experimentation with alternative tree densities is recommended. The Michigan DNR is currently using variable spacing of 3 x 3 feet combined with 3 x 6 feet. I recommend that the USDA Forest Service use 3 x 6 feet and 5 x 7 feet.
2. In stands with more than 500 stems per acre of tree stocking, it may be feasible to regenerate 2 to 3 acre patches on 20 percent of a stand, and avoid the expense of full (large-scale) planting.
3. It may be possible to regenerate dense 1 to 4 acre patches by leaving small clumps of standing mature jack pine during prescribed burns.
4. In unburned areas lacking appreciable advance regeneration, a shelterwood cut followed by supplemental planting could provide high-quality habitat.

*Seems contrary to last page + c*

5. Plant from 20 to 30 percent of some stands with red pine at the same spacing as in item #1 (above).
6. Large residual patches (greater than 50 feet wide) of mature trees within wildfire areas may have advance regeneration than can be released by removing the overstory from 6 to 8 years after a burn.
7. a. Very poorly stocked areas in burns greater than 20 acres could be fill-in planted about 5 or 6 years after the fire at 5 x 6 feet spacing.  
b. Because the Mack Lake Burn has so much well-stocked habitat, additional planting should be delayed there until 1989 to 1992.  
c. Thus, fill-in planting should be scheduled before the existing trees are from 3- to 3.5-feet tall. In many places the inter-planted pines (esp. red pine) were established too late to affect habitat quality.

C. Tree species other than jack pine.

1. Red pine appears to have been beneficial to Kirtland's warblers in three stands because it extended their occupancy period by keeping live, lower foliage longer than jack pine.
2. The slow, unpredictable early growth of red pine makes it unsuitable for fill-in planting.
3. Experiment with planting red pine at densities prescribed for Kirtland's warbler on appropriate sites adjacent to KWMA's now managed for red pine.
4. a. The presence of northern pin oak (*Quercus ellipsoidalis*), choke cherry (*Prunus virginian*), or black cherry (*P. serotina*) may not be disadvantageous to Kirtland's warblers when dense jack pine thickets also are present.  
b. In places where jack pine regeneration is marginal, oak sprout-growth should not be sprayed.

c. Kirtland's warblers have been found at high densities in stands (Damon Burn) with up to 20 percent oak (Smith 1979).

D. Snags and residual trees.

1. Snags and residual trees that escape wildfire or harvest can be valuable song perches for Kirtland's warblers and are clearly beneficial where cowbirds are controlled.
2. When cowbirds are not controlled, nest parasitism is higher near snags (Anderson and Storer 1976).
3. Residual oak and pine trees are used for both singing and foraging, and maybe important in attracting the first males to a breeding area. Residual trees should probably not exceed 5 percent canopy cover.

E. Slash. Slash and logging debris are used extensively for Kirtland's warbler foraging.

1. Managers should use caution when prescribing whole-tree harvesting on unburned stands because almost all foraging in openings or in dense ground cover is on logs, stumps, or slash.
2. I recommend that each Kirtland's warbler unit have at least one of its unburned cutting blocks harvested by conventional cutting.

F. Ground cover composition.

1. Kirtland's warbler appear to accept most ground cover communities associated with dense jack pine stands on very poor sites.
2. If the ground cover requirements of the Kirtland's warbler are no more specific than a low, light cover of shrubs, grasses, and sedges, it should be possible to generate suitable habitat without fire.
3. Unburned stands with Carex sedges as a dominant ground cover is probably related to the open tree cover of stands with dominant Carex.

4. For a more specific ground cover, management can maintain or increase the xeric shrubs and/or retard ground cover succession on the better sites.
  - a. Mechanical disturbance such as plowing or discing breaks up sod and low shrubs such as blueberry (*Vaccinium* sp.). This treatment is probably more effective than fire for altering ground cover composition.
  - b. If optimal tree densities are achieved in unburned stands, shade should be sufficient to help favor shrubs over grass and sedge.

G. Table 1 -- Prioritizing stands for prescribed burning.

Higher Priority Stands	Lower Priority Stands
1. Many residual jack pines	Significant advance regeneration
2. Abundant slash	Less slash, smaller residual trees
3. Better sites (>50 SI)	Poorer sites (<<50 SI)
4. Dense broadleaf undergrowth	Low to moderate hardwood competition
5. No other site preparation anticipated	Good potential for "V-plow" planting or other heavy scarification
6. No fire history during last rotation	Recent history of fire



### III. Natural Regeneration vs. Plantation

- A. Much of the past focus on Kirtland's warbler habitat regeneration has revolved around the need for fire. The future focus should be on the need for natural regeneration on burned or unburned sites (table 2).
- B. Table 2 -- Jack pine management options.

Harvest Option	Site Preparation	Regeneration <sup>a</sup>
Strip-cuts	Prescribe burn	Assess stocking
	Plow	Plant as needed between strips
Shelterwood	Burn and scarify	Assess stocking, plant as needed
	Scarify	Direct seeding, Assess stocking
	Plow	Plant as needed
Seed tree	Burn and scarify	Direct seeding, assess stocking, plant as needed
	Roller - chop, plow	Full planting
Conventional clearcut	Roller - chop, plow	Full planting
Whole tree harvesting	Disc/harrow/plow	Full planting

<sup>a</sup>Kirtland's warbler management requires denser stocking than timber management.

- C. Natural regeneration will improve the quality of habitat even in the best stocked plantations where natural regeneration is excellent. planting costs can be reduced substantially.
- D. 1. Seed tree burns have been unsuccessful at regenerating jack pine in Kirtland's warbler habitat.
2. Unacceptable delays have occurred in planting warbler habitat because so few days are suitable for burning in a season.
3. Prescribed fire has the potential to dramatically cut the costs of planting habitat, but safety concerns will have to be addressed.

4. Natural tree stocking can be increased by leaving more standing volume before prescribed burns.
- a. Leave strips
  - b. > 40 feet<sup>2</sup> BA seed trees
  - c. Use shelterwood where natural regeneration is insufficient. (Shelterwoods have been mostly unsatisfactory for full regeneration, and windthrows are a serious problem with this option.)