

A Kirtland's Warbler Assessment for the Hiawatha NF (With a specific example for the Raco Plains LTA)

(S.Sjogren,11/18/03)

Introduction

The purpose of this document is to provide information on Kirtland's Warbler populations and management on the Hiawatha, list pertinent issues and opportunities for KW management on the Hiawatha, provide suggestions on how the Forest can support KW recovery, meet ESA requirements, and describe an example KW management scenario for the Raco LTA.

The objective of the Forest Service's Threatened and Endangered Species program is to "*Manage National Forest System habitats and activities for TES to achieve recovery objectives so that special protection measures provided under the ESA are no longer necessary*" (FSM 2670.21). It is Forest Service policy to "*Place top priority on conservation and recovery of endangered, threatened and proposed species and their habitats*" and to "*Establish through the Forest planning process objectives for habitat management and/or recovery of populations, in cooperation with States, the FWS, and other Federal agencies*" (FSM 2670.31).

The Hiawatha Forest Plan provides clear objectives to manage habitat for KW. The Plan states that "*Forest Managers will cooperate with approved Recovery Plans for TES species.....cooperate with the MDNR in identifying potential KW breeding areas within the Forest boundary....emphasize restructuring the vegetative management plans, creating better coordination between management of the wildlife resource and other resources....increase habitat improvements that occur as a result of the timber sale program, including improvements in the size, shape, age and distribution of regenerated stands*" (IV-8). However, the Forest Plan does not address specific standards and guidelines relative to KW.

Assessing the ecological capability of the Hiawatha to provide KW habitat is important since viability can best be assured if suitable ecological conditions are broadly distributed or of high abundance within the planning area and the disjunct areas of suitable ecological conditions are typically large enough and close enough to permit dispersal among subpopulations. Lacking Forest Plan intervention, the SVE process for Forest Plan revision described the future habitat outlook for KW on the Forest as existing at very low abundance (outcome "E"). The Forest has the ecological capacity to support a viable KW population and with adequate new standards and guidelines the SVE outcome for KW on the Hiawatha can be improved (Outcome "C" or better).

To assist in species recovery and maintain KW viability on the Forest, stand-specific KW management guidelines are needed for the major sand-outwash ecosystem LTA's on the Hiawatha National Forest; Whitefish Delta, Indian River Uplands/Steuben Outwash (old Beaton Lake Outwash), Raco Plains, and Wetmore Outwash. Table 1 and Map 1 illustrate the landscape distribution of most of the potential KW habitat (jack pine) across the Forest. There may be suitable habitat outside of these 4 outwash LTA's but the highest priority for KW would be jack pine on the 4 major outwash sand ecosystems. Please note that LTA boundaries on the Hiawatha were recently updated and the following figures and maps are based on the previous LTA edition. The major change is that the new Indian River Upland LTA and Steuben Outwash LTA were previously combined into the Beaton Lake Outwash LTA. The following table and map describe the ecological capability of the Forest to produce KW habitat.

Map 1. Outwash sand ecosystems of the U.P. with Hiawatha NF boundary and 4 major outwash LTA's on the Forest. The 2 southern LTA's on the west unit currently provide KW breeding habitat.

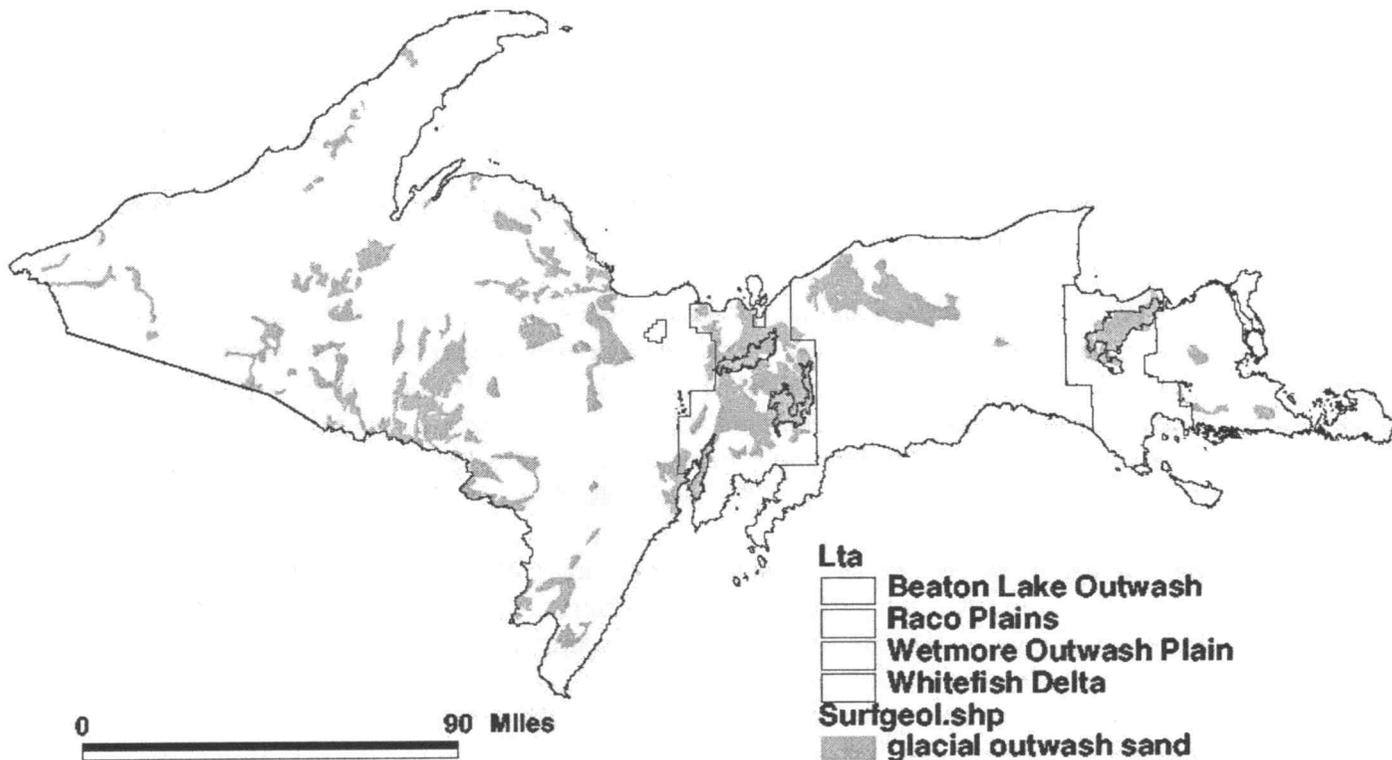


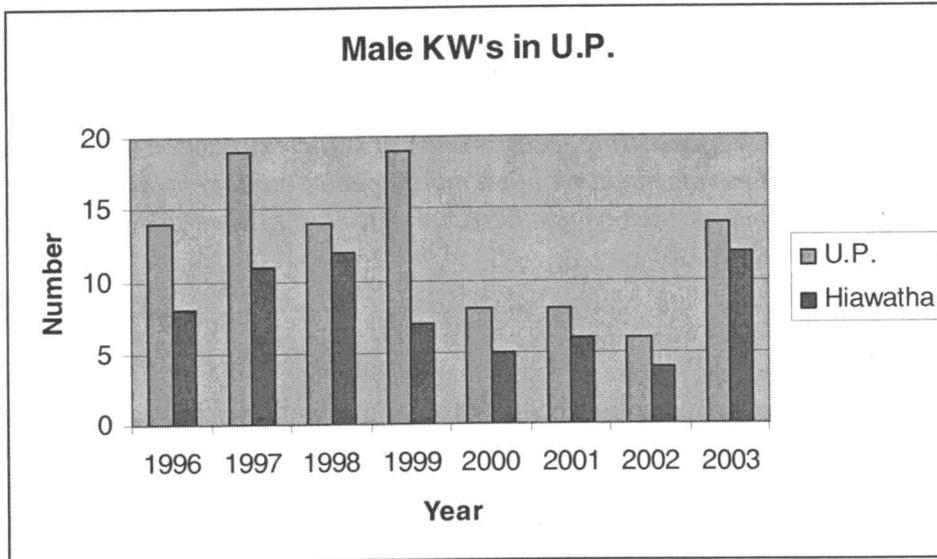
Table 1. Distribution by LTA of jack pine on the Hiawatha

LTA Name	Total acres	Total jack pine acres
Beaton Lake Outwash (includes Steuben Outwash and Indian River LTA's)	39,862	9,291
Whitefish Delta	13,571	4073
Wetmore Outwash (south)	32,914	8,611
Raco Plains	63,000	27,845
Totals	149,347	49,820*

*there are currently about 70,000 acres of jack pine on the Forest

The Hiawatha NF currently provides habitat for most of the breeding KW's in the U.P. (chart 1).

Chart 1: Total males counted in the U.P. compared to males counted on the Hiawatha NF between 1996 and 2003.



Section 7 (a)(1) of the ESA directs “*all Federal Agencies to, in consultation with the U.S. Fish and Wildlife Service, proactively conserve listed species by carrying out programs aimed at their recovery. Moreover, section 7(a)(1) allows for Federal agencies to prioritize the conservation and recovery of listed species along with other traditional agency mandates or missions. To this effect, section 7(a)(1) imposes on each Federal agency an affirmative duty to conserve listed species.*”

KW Habitat and the UP

The following 3 paragraphs provide a good brief introduction to KW biology and habitat requirements as they relate to the U.P. of MI. They are excerpted from a recent publication titled; Kirtland's Warbler Population Trends and Summer Range Expansion to WI and MI Upper Peninsula. (Probst et al 2003);

“The Kirtland's warbler is an endangered species that breeds in large (100 ac) stands of young (5-23 years old) jack pine growing on extremely well-drained soils in northern Michigan. The density and patchy distribution of the jack pine comprising suitable habitat regenerates naturally after wildfire, and can be mimicked imperfectly by plantations and natural regeneration following site preparation with and without seeding, which can have a similar percent cover of trees but at lower densities than produced by wildfires. Plantations created specifically for Kirtland's warbler breeding habitat have more trees than in stands resulting from standard forestry prescriptions or by the natural regeneration that follows tree harvesting. Female Kirtland's warblers frequently place their nests on the ground at the edge of thickets and openings in these young jack pine stands.

There is a need to develop more habitat for Kirtland's warbler for peripheral populations, but there are practical barriers to expensive, single-species land management objectives. Based on historical breeding densities, 500 to 1000 acres of high-density jack pine on suitable sites would be required on a sustained basis to support each 25 pairs of Kirtland's warblers. Assuming 50 years of commercial forest rotation and a 10-year warbler occupancy of a habitat patch, 2500-5000 ac

would be required to sustain the minimum amount of young pine regeneration for Kirtland's warblers and associated wildlife. These lands need not be contiguous based on preliminary dispersal data presented here. Regardless of whether a self-sustaining peripheral population can be established, any suitable habitat developed serves as a reservoir (e.g. 1995-1999) during periods of habitat shortage in the core breeding range even if peripheral populations subsequently decline.

The most expedient way to justify regenerating forest stands of sufficient size for this species is to place Kirtland's warbler habitat management within a multi-species management program with other area-sensitive, openland species such as northern harrier, sharp-tailed grouse, or upland sandpiper. "

Issues and Opportunities

KW recovery presents the Forest with an opportunity to contribute significantly to the recovery of an endangered species and produce commercial timber products as an output of that management. Since KW requires intensive timber management to create breeding habitat, sustainable timber production into the future is assured. This represents an excellent opportunity to integrate timber and wildlife resources to benefit both programs.

Jack pine stand size needs to be large to support KW breeding. Harvest blocks need to simulate the scale of natural disturbances, such as fire, if KW are to use the habitat. Stand size can range from as small as 100 acres to several thousand acres. Treatment blocks of 1000 acres or larger are desirable to optimize KW productivity (Strategy for KW Habitat Management, 2001). Large harvest blocks in jack pine ecosystems are generally supported both internally and by the public, especially when they are created with commercial timber sales that benefit an endangered species. Large harvest block size or temporary openings benefit several Region 9 Sensitive wildlife species that are also adapted to historic fire-regimes (sharp-tailed grouse, LeContes sparrow, short-eared owl, black-backed woodpecker, prairie warbler) and prevents further loss of viability for those rare species.

Jack pine regeneration units need to be dense enough to support KW breeding. Specific recommendation on density requirements are outlined below under "Suggested KW management activities". There may be an internal concern that higher stocking levels (1089 trees/acre) may reduce jack pine growth rates and economic return, compared to a standard timber prescription for stocking (800 trees per acre). The jack pine Managers Handbook recommends pre-commercial thinning when stands exceed 2000 stems per acre, a density above suggested KW stocking levels. If growth rates are a concern, TSI would still be an option when stands reach 20 years of age. Jack pine total biomass productivity would likely be unaffected by stocking levels, so that if stands are chipped, commercial volume may actually be increased. Documentation is lacking to quantify the theory that commercial jack pine short-wood productivity would be reduced by higher stocking levels. Any projected loss in jack pine short-wood productivity would need to be weighed against the opportunity for meeting multiple resource goals through the harvest and regeneration of timber. The Hiawatha Forest Silviculturalist has stated that while the potential loss of volume caused by higher stocking densities is not a serious concern to him, growth and yield model runs should be used to address this issue.

Perhaps of greater concern, is the concept that it may be too difficult or expensive to achieve 1089 trees per acre (Forest Silviculturalist). Reforestation costs are largely paid from timber sale receipts (KV fund) which

have generally been sufficient to cover reforestation expenses, including plantation establishment. Red pine thinning could be added to jack pine sales to increase KV funding opportunities. Assuming a KW habitat program of 600 acres per year, there could be as much as a 10% increase in the cost of the Hiawatha's annual reforestation program (\$600M total program budget) to meet the higher stocking requirements of KW habitat (Forest Silviculturalist estimate). There are also challenges in scheduling natural regeneration site-prep (chop/chain with skidder) to closely follow harvest while seed is still viable. While high stocking has been achieved on the Forest with no additional cost on some sites, it will be important to determine how best to achieve high stocking at lowest cost. There is likely to be an increased cost to manage for KW's, but it is possible that good coordination and strategic placement of KW habitat can reduce projected costs. For example, higher stocking with no extra cost has been achieved on the Hiawatha on the better sites, on sites with higher water tables, following wildfire or where site prep follows immediately after harvest.

Approximately 20% of the jack pine on the Hiawatha has been converted to other types since 1983 (88,400 acres down to 70,100 acres). This represents a cumulative decline in opportunities to manage habitat for KW and other species of early successional and jack pine ecosystems.

The Hiawatha Forest Plan identified 43% (38,000 acres) of the Jack Pine working group as unsuitable (not appropriate) for timber production (1/8/91 letter from G. McLaughlin clarifying the unsuited land base). The Forest Plan states that timber management may occur on these unsuitable lands to meet habitat objectives for TES (Appendix L). It would be preferable to manage this habitat on the suitable land base since the timber and wildlife objectives are compatible. However, if the KW habitat was only placed on the unsuited jack pine lands, there would theoretically be no impact to the timber resource since the lands were not identified as needed for commercial production in the existing Planning horizon. KW habitat may be placed on unsuitable lands, or the poorer sites, since slower jack pine growth rates do not impact KW.

KW habitat management requires long-range planning and a steady supply of commercial timber products to establish a balanced jack pine age-class distribution. There are currently 150,000 acres of jack pine forest in lower MI. that are designated essential habitat for Kirtland's Warbler (KW). The KW recovery team has documented the need for an additional 40,000 acres of jack pine habitat (Recovery Team Letter to USFWS, 1/12/02), needed to provide habitat for 1,000 pairs, which is the minimum required for species recovery. The NOI for the Huron-Manistee identified 18,000 additional acres that would be possible for management as KW habitat. The Hiawatha and MDNR have not yet identified acres to help meet this goal. There is an opportunity for the Hiawatha to contribute to this endangered songbird's recovery.

Suggested KW management activities

On the Hiawatha, one approach would be to establish 30,000 acres of jack pine KW emphasis area. For example, the 30,000 acres of jack pine could be distributed as shown in Table 2. While KW habitat would be a priority on these lands, commercial timber production would continue and would be the primary tool for creating habitat. Jack pine would be grown to full rotation (50 years) and age classes would be distributed evenly with approximately 6,000 acres in each of 5 age classes (0-9, 10-19, 20-29, 30-39, 40-49) across the Forest. This would result in approximately 600 acres of KW habitat created each year on the Forest (6,000 acres per decade). Each of the 4 KW emphasis blocks would need to move towards a balanced or even age-class-distribution to ensure habitat is sustained at a scale useful to breeding KW. The Forest could theoretically sustain 226 breeding KW each year, if 6,000 acres of high quality habitat were maintained every decade, and if all suitable habitat was fully occupied (26.5 birds/1000 ac breeding habitat).

Table 2. Distribution by LTA of the highest priority jack pine-KW habitat on the Hiawatha

LTA Name	Total acres	Total jack pine acres	Proposed jack pine acres with KW emphasis
Beaton Lake Outwash (includes Steuben Outwash and Indian River LTA's)	39,862	9,291	9,000
Whitefish Delta	13,571	4,073	4,000
Wetmore Outwash (south)	32,914	8,611	5,000
Raco Plains	63,000	27,845	12,000
Totals	149,347	49,820	30,000*

*30,000 acres is about 43% of total Hiawatha jack pine

Block size; Based on 30,000 total acres of KW emphasis area, and a 50 year rotation age, the Forest would need to harvest about 600 acres per year (6,000 per decade) spread over the 4 emphasis areas. Block size could range up to 600 acres or more, but could also be split into two units in a given year to be flexible and meet needs in various emphasis areas. The Forest Plan projected Jack Pine timber harvest for decade 2 is 1,350 acres per year (IV-16). Actual jack pine harvest has averaged 1,808 acres per year. Under this scenario, KW management would represent about 1/3 (600 of 1,800 acres) of the total annual jack pine harvest and reforestation program on the Forest.

Stocking Density; it is important to provide jack pine stocking density that meets KW breeding requirements. KW habitat standards suggest an average stocking density of 1,089 trees per acre including small non-forest inclusions (approximately 25% open per acre). Ideal tree spacing is approximately 5'X 6' with one 0.25 acre opening per acre. Due to the opening, the actual tree density (outside the opening) is about 1450 trees/ac. This can be accomplished with planting or the preferred natural regeneration (chop/chain/seed) method. Natural regeneration is much less expensive and is best if chop/chain occurs within 2 weeks of harvest (Forest Silviculturist recommendation). It is important to complete site prep before the cones on slash open, so that seeds fall and germinate on mineral soil. If seeds fall and germinate on unsuitable ground (grass mat for example) they will not survive. It may be worth experimenting with supplemental seeding directly on mineral soil (instead of a snow crust) immediately after site prep. Fill-in planting may be used as needed to achieve stocking goals after 3rd or 4th year stocking survey. Stands grown to full commercial rotation. TSI is an option, if desired, after age 23.

Fire ecosystem considerations; Reserve one acre linear green pine islands per 80 acres of clear-cut (1 island per 80 acres) to meet objectives for den and snags and to maintain components of a fire ecosystem (i.e., HRV strips found after hot wildfires). Leave 1 large white or red pine trees per acre in jack pine clear cuts to provide stand diversity and maintain components of a fire ecosystem (i.e., large red pine trees frequently survive wildfire). Reserve all dead trees in harvest units that are not a safety hazard to meet objectives for den and snags and to maintain components of a fire ecosystem (i.e., standing and down CWD found after

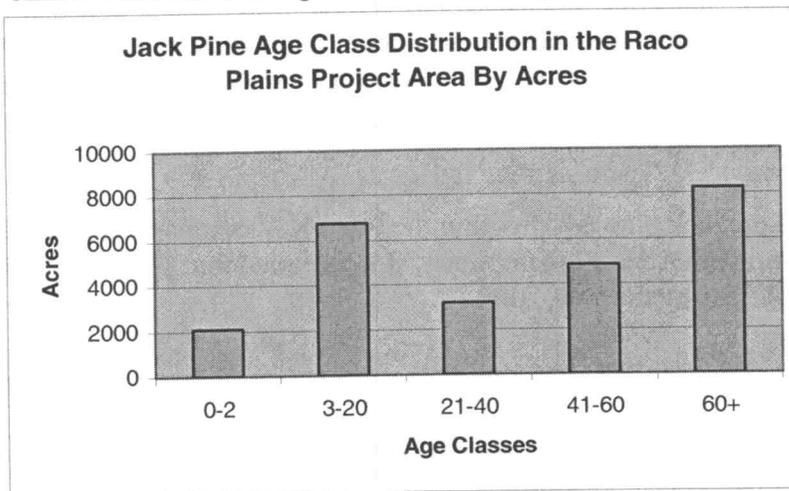
wildfires). If hazard trees are felled for safety, they should ideally be left on the site. Reserve 10 acre patches of over mature jack pine where black-backed woodpeckers are breeding in proposed clear-cut units. Dense jack pine stocking described above is closer to the high jack pine stocking densities found after wildfire.

Raco Example

Due to the jack pine budworm outbreak at Raco on the East Unit, the District Ranger is considering clearcut-salvage of 6,000 acres of jack pine forest type. In order to address Forest Plan objectives and revision, KW Recovery Team goals and ESA requirements, it is important to evaluate the Raco budworm project in the context of KW habitat across the Forest.

There are approximately 63,000 acres in the Raco Plains Land type Association (LTA). About 27,000 acres of the LTA is currently jack pine with an age class distribution skewed towards over-mature (chart 2). Many of the jack pine stands harbor jack pine budworm and 6000 acres of high risk jack pine is currently being evaluated for clearcut-salvage between 2004 and 2008. Most of the remainder of the LTA consists of red pine plantations (22,000 acres), non-forest (5,500 acres) and scattered stands of swamp-conifer, wetland, aspen and hardwood (9,000 acres).

Chart 2: Total Jack Pine Age-Class-Distribution (acres) in the Raco LTA



There have been no KW's documented in the Raco LTA. The nearest known KW was located in 2003 on MDNR land about 40 miles from Raco, just northwest of Newberry. The Rubicon soils of the Raco LTA are similar, but slightly better than the Grayling sands used by KW in the core habitat near Mio, MI. The Raco LTA currently lacks suitable KW habitat. An effective fire prevention program coupled with historically small stand sizes (<40 acres) and difficulty in establishing jack pine regeneration have resulted in an unsuitable KW habitat condition. Large stands with well stocked jack pine regeneration that could provide breeding habitat for KW's are not currently available. The Raco LTA does contain good potential habitat and if suitable large-scale habitat were provided, it is likely KW would breed there. Providing breeding habitat outside the core range serves as a reservoir and is extremely valuable for species recovery.

In order to plan for KW management in the Raco LTA, 332 stands totaling approximately 12,641 acres of jack pine were identified as the most suitable to prioritize for the higher stocking levels required by KW

(Map 2). The existing 10 year jack pine age-class distribution in the Raco KW higher stocking emphasis area may be seen spatially in Map 3.

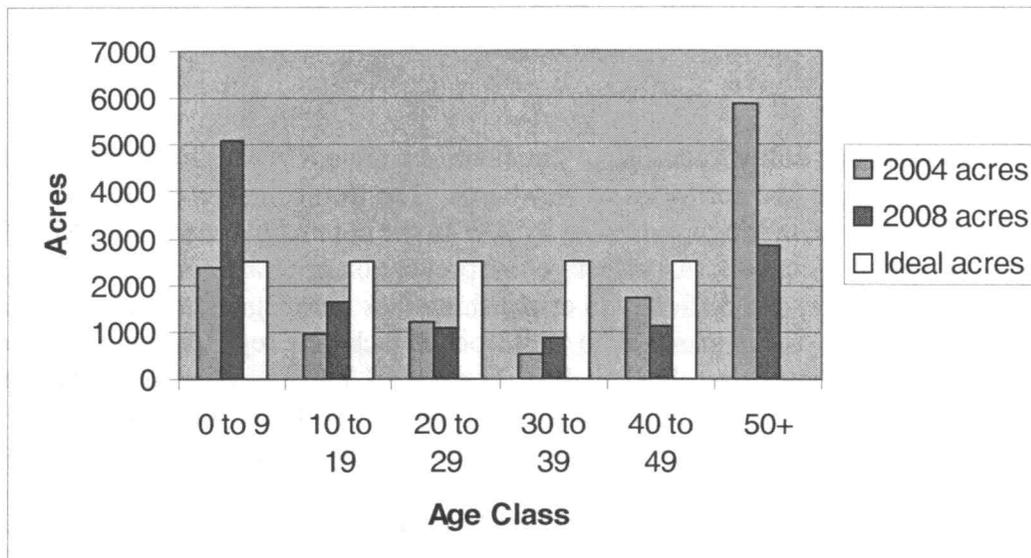
The following factors are important considerations in selecting KW habitat:

- Contains extensive blocks of contiguous jack pine (regardless of age or budworm impact)
- Close proximity to existing large openland and young pine stands
- Large portion in MA 4.4 with wildlife emphasis
- Existing marginal habitat (ie; large red pine plantations with extensive jack pine volunteers creating relatively high stocking densities)
- Areas showing good jack pine stocking in new young stands
- ELTP favorable to jack pine regeneration
- High water table
- Probable lower cost of reforestation

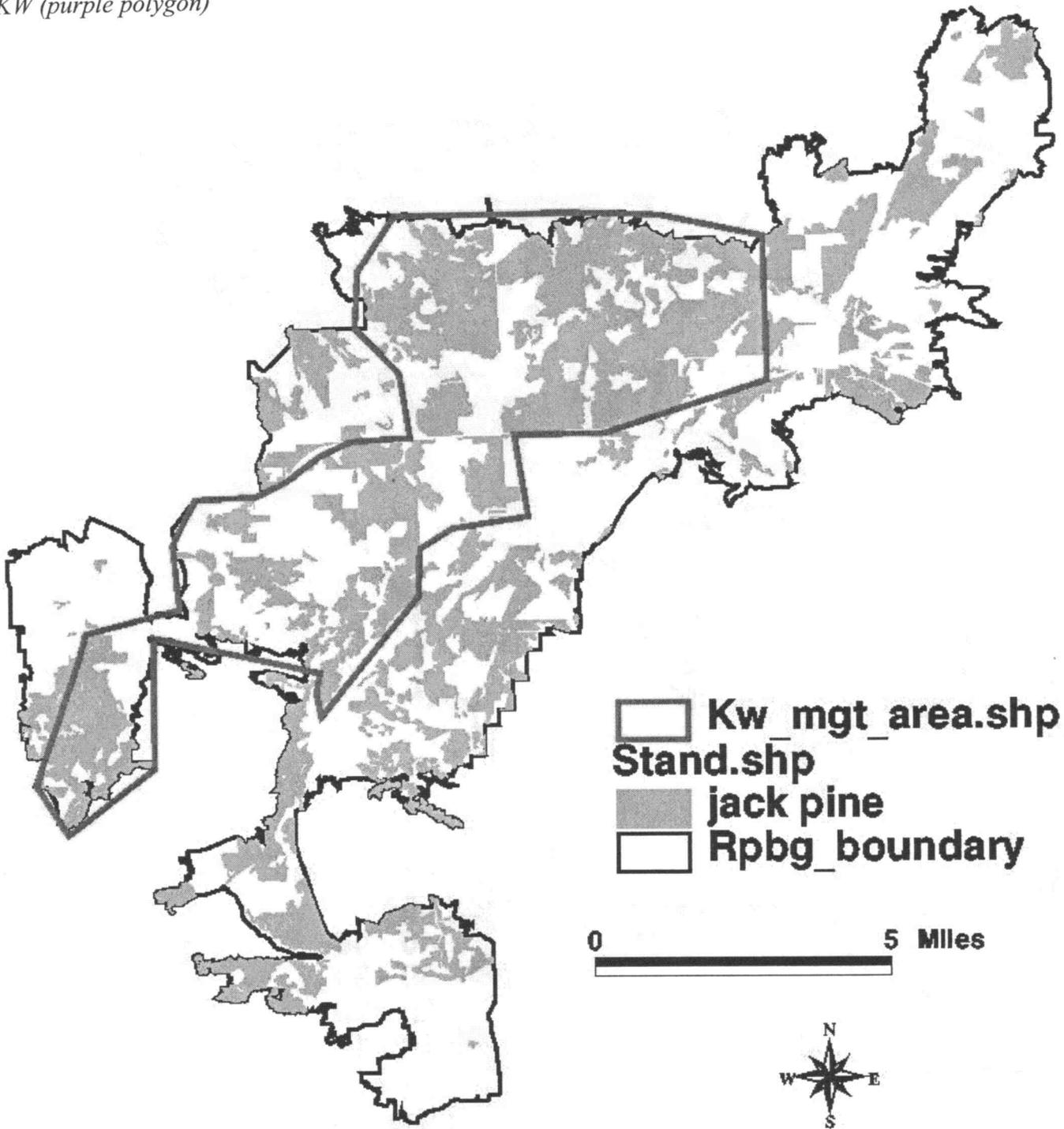
In order to plan for a balanced age class distribution within the KW emphasis area, it is necessary to schedule the cuts into the future. Based on a 50 year rotation, ideally about 2500 acres of jack pine would be harvested each decade. This would place 1/5th of the jack pine in each of the 10 year age classes (1/5th of 12,000 total). Due to the extensive area of budworm impacted, over mature jack pine in the KW emphasis area (chart 3) and in the LTA (8,000 acres over the age of 60), it may be beneficial to accelerate the harvest in 2004-2008. This acceleration would maintain healthy jack pine stands and provide a good initial burst of KW habitat, similar to that which would result from a wildfire. Map 4 shows the jack pine harvests proposed to address over mature jack pine, the budworm situation and provide KW habitat (approximately 3,400 acres).

Under this management scenario the jack pine ACD within the Raco KW emphasis area would trend towards a more balanced condition (Chart 3). For simplicity, it is assumed that about 50% of the jack pine will move to the next 10 year age class by the year 2008.

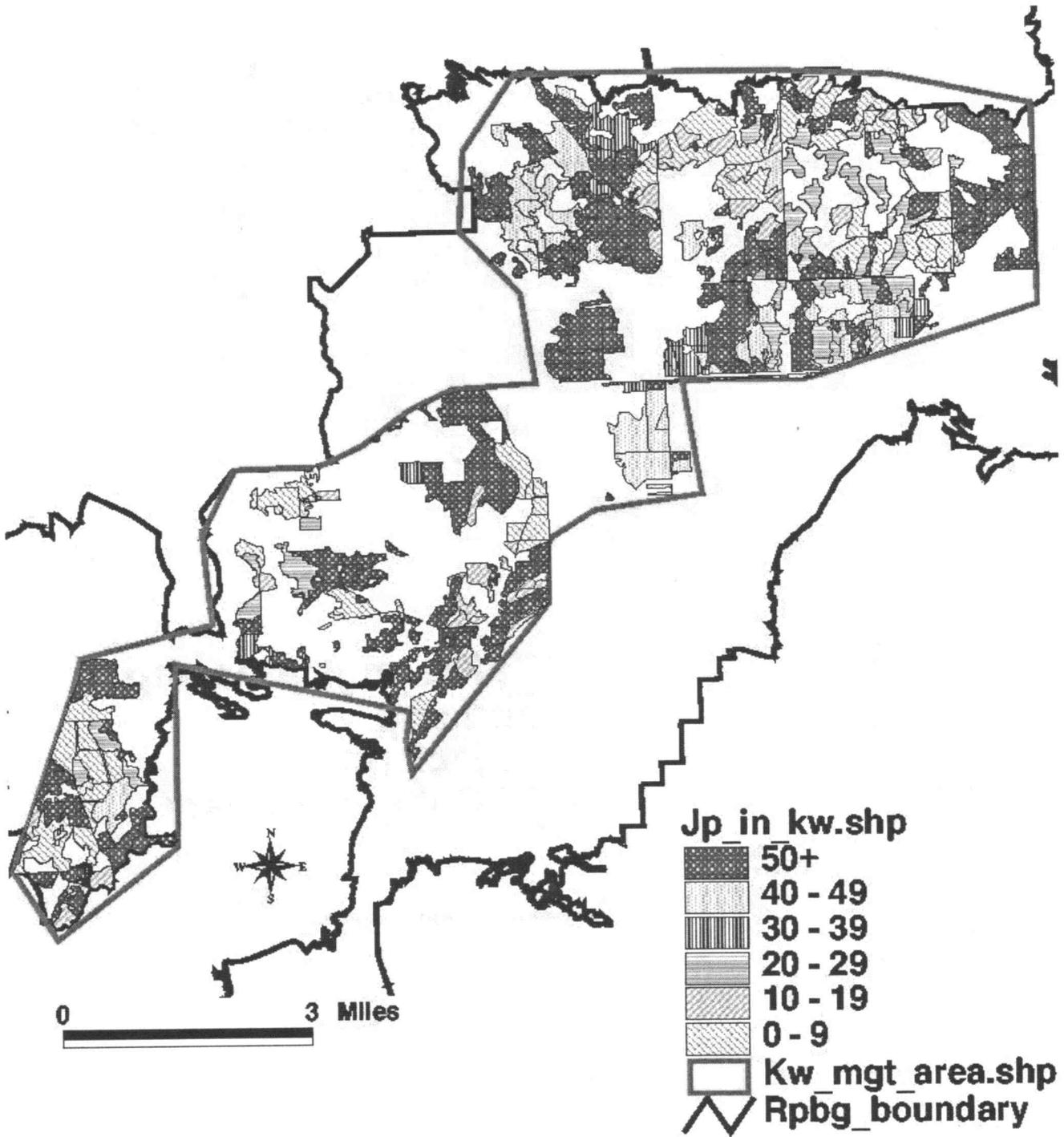
Chart 3 . Current (2004), projected (2008), and ideal ACD of jack pine in the Raco KW emphasis area.



Map 2. Raco LTA showing all jack pine and proposed area to emphasize higher stocking levels to benefit KW (purple polygon)



Map 3. Existing jack pine age-class-distribution in the KW (higher stocking)emphasis.



Map 4. All jack pine (yellow) and jack pine harvest scheduled for 2004-2008(cross-hatching) in KW emphasis (high stocking).

