

# **Barnes Barrens Management Plan**

*(amended to include Kirtlands Warbler considerations - 20130812)*

## **Preface**

Chapter 840.3.6 of the Bayfield County Forest Comprehensive Land Use Plan identifies Pine Barrens as a habitat of importance. The Land Use Plan also outlines general parameters regarding Pine Barrens management and introduces the concepts of surrogate and floating barrens. The Barnes Barrens Management Plan is intended to provide guidance and direction in the development and perpetual maintenance of large block Pine Barrens habitat on the Bayfield County Forest.

## **Location and History**

The Barnes Barrens Management Area is roughly 11,500 acres in size, is located in the Town of Barnes in western Bayfield County and is within the Northwest Sand Ecological Landscape. This area is considered one of Wisconsin's Priority Conservation Opportunity Areas for Wildlife Species of Greatest Conservation Need, referred to as the Douglas and Bayfield County Barrens Conservation Opportunity Area. A complete description of the Northwest Sands Landscape is available in the Wisconsin Ecological Landscapes Handbook.

Pine Barrens are classified as a true savanna type. The term savanna is used for any plant community where trees are a component, but where their density is so low that grass and other sun-loving herbaceous vegetation dominate. Pine Barrens are unique among savannas in that the shrub component is much more extensive than in other savanna types.

Pine Barrens have become increasingly rare on the landscape and are considered globally imperiled and imperiled in the state of Wisconsin. Many wildlife species, like the federally endangered Kirtland's Warbler, and many species of flora and fauna are dependent on the existence of Pine Barrens.

Three major factors: fire, soils, and topography dominate the development and maintenance of Pine Barrens. Humans have had a large influence on the fire factor. Intensive fire control has virtually eliminated the frequent fires which once occurred naturally in the Pine Barrens.

Pine Barrens are a tenuous group of communities pulled in opposing directions by disturbance and plant succession. Depending on the severity and frequency of disturbance, or the lack thereof, Pine Barrens communities range structurally from grasslands to forests. Pine Barrens habitat or community types include:

- **Open Barrens:** This is a grassy, prairie-like habitat type with very little woody vegetation. It is an early seral stage of Pine Barrens habitat. Over time and in the absence of disturbance such as fire, woody vegetation will become increasingly abundant and dominant, changing to a different habitat type.
- **Brush Prairie Barrens:** This type is dominated by short woody vegetation, including hazel, willow, scrub oak, and scrub aspen.

- Savanna Barrens: This type contains scattered individual trees from small groups of trees to patches or stands of trees. Tree age can vary from young to mature. Tree height can range from short, i.e. scrubby, on low moisture, poor nutrient sites, to average height on better sites. This type is often a transitional type or phase between the open or brush prairie barren types and the forested barrens type.
- Forested (Pine) Barrens: These are areas where trees have become dominant and are generally considered to be a forest habitat type. These areas usually contain and retain all of the plant species associated with the more open barren habitat types. When a disturbance, such as a fire or timber sale occurs in this type, these sun loving plant species will become more abundant and dominant until trees begin to crowd and shade them out.

In the absence of fire, natural plant succession coupled with an intensive tree planting program has turned almost all of the Pine Barrens in Bayfield County and in Wisconsin into forests. Pine Barrens management on the Bayfield County Forest includes the creation and maintenance of both permanent and temporary (surrogate) open barrens and brush prairie barrens habitat types. These are the least common types of Pine Barrens habitat and are the types that, in the absence of disturbance, become forested over time; hence they become a forest habitat.

The following sections outline the critical steps required to create and maintain permanent and surrogate barrens within the Barnes Barrens Management Area. The strategic use of commercial timber sales, prescribed fire and herbicide application will be implemented to achieve this goal.

### **Goals and Objectives**

This special management area will provide critically important Pine Barrens habitat through the simultaneous development of jack pine and open and early successional barrens. In managing any natural resource, it is necessary to develop principles and guidelines to meet specific objectives. This plan defines operational parameters and guidelines that must be followed to achieve the desired future condition. Management zones were designed to give the forester flexibility in timber sale planning. A few important objectives are as follows:

- Delineate approximately 11,500 acres as a special management area on the Bayfield County Forest for the simultaneous management of timber products and the development and maintenance of early successional Open and Brush Prairie Pine Barrens habitat.
- Identify and delineate a “core” area and four management zones within the special management area. The core area will provide permanent open barrens habitat and the zones will serve as floating surrogate barrens.
- Develop a timetable for the systematic harvest and regeneration of timber in each designated management zone.
- Designate approximately 200 contiguous acres within each zone as Kirtland’s Warbler Habitat Areas (KWAHA). Reforest these areas to jack pine at densities that are conducive to creating suitable Kirtland’s Warbler habitat. Currently, suitable habitat contains at least 1,200 stems per acre, combined with 1 to 5 unforested openings per acre. Openings should total approximately 25% of the stand and be evenly distributed.

- Direct the Foresters of Bayfield County, through principles and guidelines, in the sustainable management of the Barnes Barrens Management Area.

### **Principles and Guidelines**

When implementing the management plan, whenever possible, incorporate the following principles and guidelines. Stand conditions and updated reconnaissance may influence future planning and goals:

- Harvest all merchantable jack pine within the Barnes Barrens Management Area by year 2025, as outlined in the attached map “Barnes Barrens cutting cycle 2012 to 2035”. Excessive mortality within individual stands may require accelerated harvests.
- Within each zone, plan and establish harvests in a manner that ensures continuous connectivity with the permanent core area.
- Establish a minimum of 900 acre, permanent, (core area) Open Barrens habitat centrally located in the Barnes Barrens Management Area. The core area will be maintained using prescribed fire and/or mechanical/chemical vegetative treatments to ensure the persistence of native warm season grasses and forbs.
- Prescribed fire has proven to be the most effective tool in maintaining grass and forb dominated habitats and is the preferred method of maintenance. However, herbicide has shown to be a useful tool in establishing Open Prairie Barrens habitat by effectively controlling the woody competition. One application of herbicide can be as, if not more, effective than repeated prescribed burning in the creation of Open Prairie Barrens habitat.
- Fuel breaks will be established on the perimeter of the core area and maintained to the same standards as County Forest Primary Roads. These roads will help facilitate timely prescribed burns and eliminate the need to construct new fuel breaks every time a prescribed burn is conducted.
- All red pine within the planning area will be converted to jack pine by 2082, whenever possible. However, manage (thin) all existing red pine stands as scheduled until the point of conversion to jack pine. There may be some special cases where red pine is retained to enhance the barrens habitat.
- Scarification and seeding will be the preferred method of reforestation, whenever feasible. Seeding creates a more variable and natural stand condition that has shown to be preferable to species dependant on Pine Barrens habitat. Compared to planting, overall volumes per acre tend to be slightly less, but establishment costs are typically less than half.
- Incorporate cutting prescriptions that do not facilitate the spread of insect and disease. For example, leaving residual trees within the surrogate barrens produces an increased risk of jack pine budworm defoliation and spread of diplodia. Another consideration is to design sale boundaries that result in the least amount of edge as possible (make sales as blocky as

possible). Irregular sale boundaries create environments favorable to the jack pine budworm.

- Aspen stands will be maintained within each management zone, but not allowed to expand and compete with stands of jack pine. Conversion of some aspen stands to jack pine is allowed only when strategically and economically feasible. Aspen has historically been a component of Pine Barrens habitat. Some wildlife species that utilize this habitat depend upon aspen as a food source. There are currently about 700 acres of aspen within the Barnes Barrens management area. The most cost effective means of limiting the natural conversion of jack pine stands to aspen is with the use of selective herbicides.
- Management zones will be used to determine an average harvest schedule per year. Prescribed activities for individual stands have a tendency to create an uneven schedule of harvests per year. Management zones will provide an even distribution of harvests per year and better facilitate responses to insect and disease outbreaks, wildfires, blow-downs, and other unanticipated natural events.
- Allow some flexibility when planning reforestation activities. An even distribution of age classes is preferred within each zone, but not essential. For example, it may be more cost effective to regenerate 300 acres of jack pine in one year instead of 150 acres over the next two (without compromising the overall goal of the plan).
- Within each designated Kirtland's Warbler Habitat Area (KWHA), reforest at least 200 acres, preferably near the approximate center of each zone, with jack pine at densities preferred by Kirtland's Warbler. Currently, jack pine stocking levels appropriate for Kirtland's Warbler are greater than 1,200 trees per acre. Preferred stocking levels can be achieved through natural regeneration, supplemental seeding or planting. If planting, space rows no wider than 6' x 6' to achieve the desired stocking levels.
- Approximately 1 to 5 unplanted (or unforested) openings should be evenly distributed within each designated KWHA. The openings should total approximately 25% of the Habitat Area and can be achieved by designating no planting areas as part of the planting design or by hand treating areas that were naturally regenerated. Including the openings, jack pine densities should average at least 1,200 stems per acre, meaning the areas in between the openings should average 1,500 stems per acre. Numerous publications exist that can be helpful when developing a reforestation plan for each KWHA. It will be important to refer to the most current literature when designing each KWHA.
- Work closely with State wildlife personnel in coordinating management strategies within the Barnes Barrens Management Area.

### **Implementation**

The plan will be implemented in two different stages. The first stage is the management of mature jack pine and the creation of the permanent "core area". The second stage is the development of the floating surrogate barrens within each management zone.

The boundaries of the zones were established based on the existing age classes of jack pine and should not be considered permanent. Ideally, each zone would consist of an equal proportion of acreage and contact with the core area. Future sale design, reforestation and possible shifting of the core area should strive towards this goal. Stand conditions and improved reconnaissance may influence future planning and goals within each management zone.

#### *Stage 1 – Core Area, Mature Isolated Jack Pine Management, Existing Red Pine Management*

Mature jack pine is currently scattered throughout the entire management area. All mature jack pine will be regenerated within the area by the year 2025. Harvest goals for the mature jack pine will be developed on an annual basis. Excessive mortality within the stands may accelerate harvest. Below is a summary of action items over the development period (refer to the map “Floating Barrens Cutting Cycle 2012 to 2035” for more detail).

- **Action:** In all Zones, from 2012 through approximately year 2025, harvest all mature jack pine. Excessive mortality may accelerate harvest. In the absence of excessive mortality or any other need to accelerate harvests, the amount of jack pine harvested per year will average approximately 145 acres. Again, average acres harvested per year may fluctuate based on the condition/health of the stand or improved reconnaissance. Also, throughout the management area, stands of red pine will be managed (thinned) as scheduled until the point of conversion to jack pine.
- **Action:** In Zone 2, reforest the remaining fuel break areas to jack pine by the year 2015 (approximately 180 acres).
- **Action:** In Zone 3, reforest the remaining fuel break areas to jack pine by the year 2022 (approximately 310 acres).
- **Action:** In Zone 4, from approximately 2026 through year 2035, harvest all stands of red pine and convert to jack pine. Harvests will average approximately 157 acres per year over the 10 year period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.
- **Action:** Establish the Core Area by no later than 2035 (earlier if possible).

#### *Stage 2 – Floating Surrogate Barrens Development*

The approximately 11,500 acre Barnes Barrens Management Area is broken into 4 management zones. Each zone surrounds a roughly 1,000 acre, permanently open core area and ranges in size from 2,468 to 2,937 acres. The management zones are assigned a 12 year harvest interval (each zone is completely harvested over a period of 12 years). During the harvest interval, whenever possible, all stands within each zone will be harvested and seeded or planted exclusively to jack pine. From the time of harvest until the point when the jack pine regeneration is approximately 10 feet in height, stand characteristics will meet the criteria for Brush Prairie Barrens. Typically, suitable Brush Prairie habitat will exist for 10 to 15 years after harvest. The habitat created during this 10 to 15 year window will serve as temporary or “surrogate barrens”.

Within each designated zone, stands will be harvested in an attempt to create a continuous 0 to 12 year old age class in relative contiguous contact with the core area at all times. This stage will begin around 2035 or as soon as the jack pine is merchantable in Zone 1. Completion of this stage (the management of the last stand in Zone 4) is expected to be by the year 2082 and repeated indefinitely. Within each zone, an attempt will be made to equally distribute regeneration acres over the entire management period (basically, the acreage of the zone divided by 12 years). Also, whenever possible, an attempt will be made to arrange the establishment of timber sales near the core area first, working toward the outer boundary of the zone by the end of the harvest period (maintaining visual connectivity with the core area is not critical, but will enhance the overall suitability of the habitat).

Within the approximate center of each zone, roughly 200 acres will be designated as a KWHa. The Areas will be planted or seeded at higher densities than normal, but will ultimately be managed like the rest of the stands (on approximately 48 year rotations). Because of the higher densities, it may be necessary to prescribe a thinning in order to capture excessive mortality and release other stems. Thinning out rows or strips, around age 30 or when stands become commercially mature, (similar to the first treatment in red pine plantations) will likely be the most efficient way to treat these Areas.

Nesting habitat is optimal when trees are approximately 5 to 20 feet tall (or roughly 6 to 22 years of age). The designation of one KWHa in each Zone will ensure that, for a period of time, at least two suitable KWHa's (totaling roughly 400 acres) will exist in perpetuity throughout the entire Barnes Barrens Management Area. Because much of the entire Management Area will be seeded, other stands may also naturally provide suitable nesting habitat.

Once fully regulated, stands within each zone will be managed on a 48 year rotation. It may be necessary to manage individual stands slightly earlier or later, but the overall goal is to complete one floating surrogate barrens cycle every 48 years. Below is a summary of action items over the initial development period (refer to the map "Floating Barrens Cutting Cycle 2035 to 2082" for more detail).

- **Action:** In Zone 1, from approximately 2035 through year 2046, harvest all stands located within the zone and, when possible, regenerate to jack pine. Harvests will average approximately 245 acres per year over the 12 year period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.
- **Action:** In Zone 2, from approximately 2047 through year 2058, harvest all stands located within the zone and, when possible regenerate to jack pine. Harvests will average approximately 206 acres per year over the 12 year period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.
- **Action:** In Zone 3, from approximately 2059 through year 2070, harvest all stands located within the zone and, when possible regenerate to jack pine. Harvests will average approximately 220 acres per year over the 12 year period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.
- **Action:** In Zone 4, from approximately 2071 through year 2082, harvest all stands located within the zone and, when possible regenerate to jack pine. Harvests will average approximately 211 acres per year over the 12 year period.

### *Management Example*

The progression of timber harvest around the core area will create continuous and contiguous open barrens and brush prairie barrens in perpetuity. For example: Zone 3 has 1,287 acres of jack pine and 800 acres of red pine, plus 558 acres of various other species. All of the stands within this zone will be harvested from 2059 through 2070. If done correctly, by year 2071, Zone 3 should consist of 2,645 acres of jack pine, 12 years of age or younger. However, roughly 200 acres are in the aspen type. These acres may be maintained, but not allowed to expand. Therefore, the total adjusted jack pine acreage from Zone 3 would be roughly 2,445. The management area was designed so that each zone is in direct contact with the 1,000 acre core area. In the above example, the amount of continuous barrens habitat created would be 3,645 acres (2,645 acres of young timber, plus 1,000 acres of open barrens). The 2,645 acres of young timber would be considered Surrogate Barrens. Each zone will be managed under this principle.

### **Summary of Action Items By Year**

2012 – 2035: Establish the Core Area.

2012 – 2025: Harvest all mature jack pine throughout the entire Barnes Barrens Management Area. Excessive mortality may accelerate harvest. In the absence of excessive mortality or any other need to accelerate harvests, the amount of jack pine harvested per year, through 2025, will average approximately 145 acres. Throughout the management area, stands of red pine will receive treatment (thinning) as scheduled until the point of conversion to jack pine.

2012 – 2015: In Zone 2, reforest the remaining fuel break areas to jack pine (approximately 180 acres).

2016 – 2022: In Zone 3, reforest the remaining fuel break areas to jack pine approximately 310 acres).

2026 – 2035: In Zone 4, harvest all stands of red pine and convert to jack pine. Harvests will average approximately 157 acres per year over the 10 year period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.

2035 – 2046: In Zone 1, harvest all stands located within the zone and, when possible, regenerate to jack pine. Harvests will average approximately 245 acres per year over the 12 year period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.

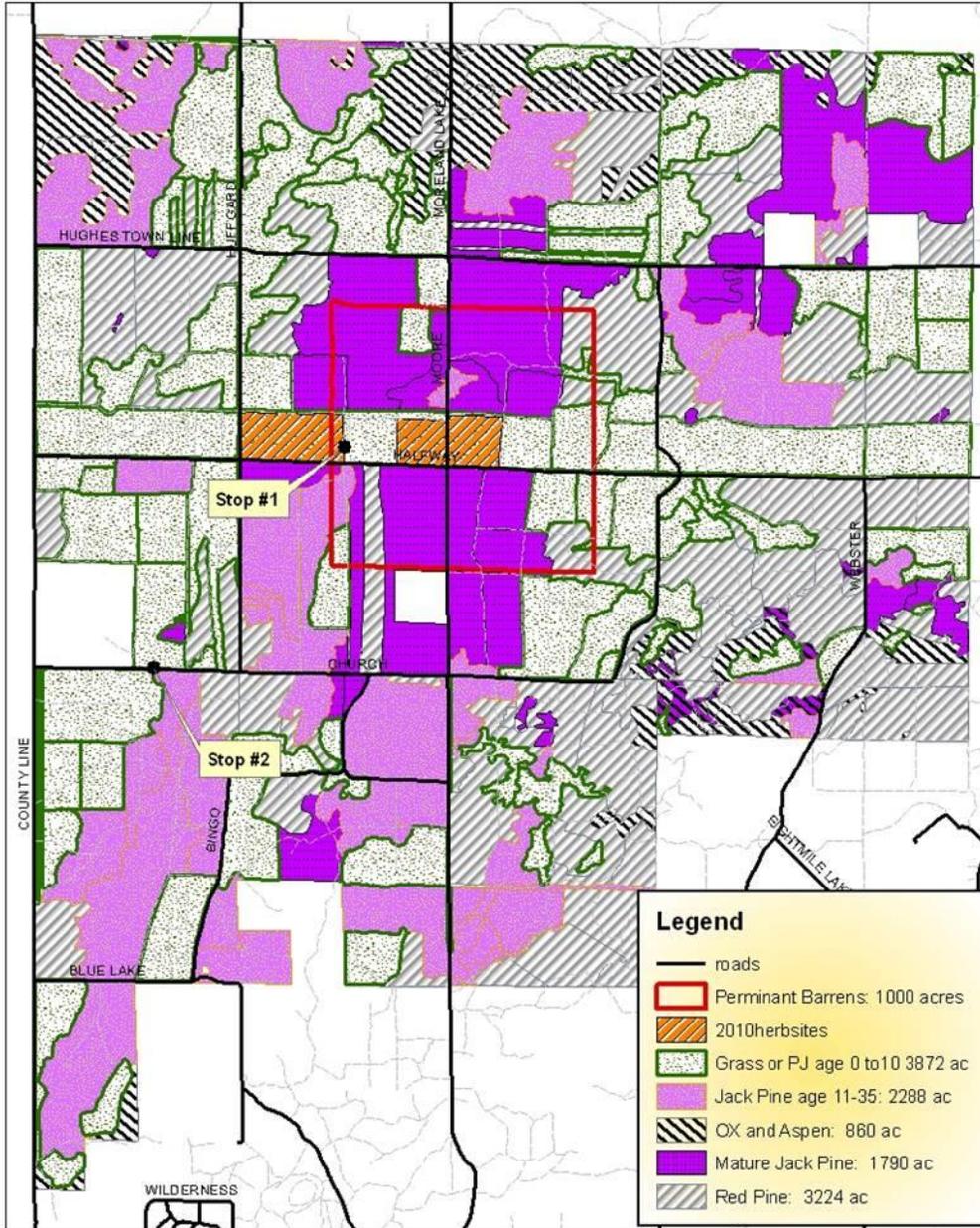
2047 – 2058: In Zone 2, harvest all stands located within the zone and, when possible regenerate to jack pine. Harvests will average approximately 206 acres per year over the 12 year period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.

2059 – 2070: In Zone 3, harvest all stands located within the zone and, when possible regenerate to jack pine. Harvests will average approximately 220 acres per year over the 12 year

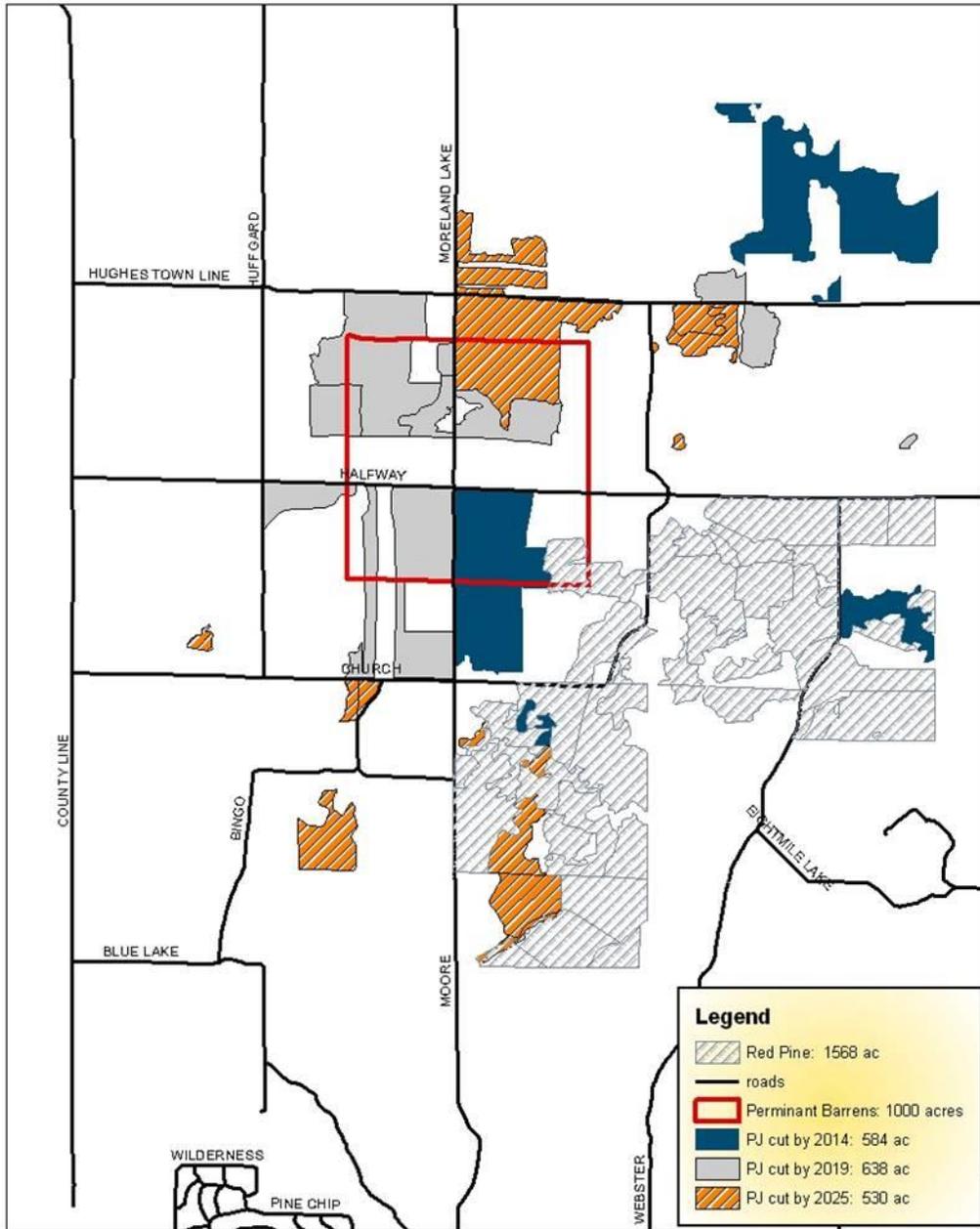
period. Also, manage (thin) red pine in other zones as scheduled until the point of conversion to jack pine.

2071 – 2082: In Zone 4, harvest all stands located within the zone and, when possible regenerate to jack pine. Harvests will average approximately 211 acres per year over the 12 year period.

## Current Conditions



# Cutting Cycle 2012 to 2035



## Cutting Cycle 2035 to 2082

