

Financial Sustainability of Jack Pine and Experimental Habitat Work Group

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I. Framing the Issue

Overview

In response to the critically low population of Kirtland's warblers in the early 1980s, land managers developed a system of annual planting of ~4000 acres of high-density, opposing-wave jack pine plantations to create a continual supply of breeding habitat. This system has been instrumental in recovering the species; however, it is becoming increasingly evident that it is neither financially, nor ecologically, sustainable. New approaches to habitat management need to be developed that do a better job of producing merchantable forest products, and do a better job of emulating stand- and landscape-scale ecological features associated with a natural disturbance regime, while still providing high quality KW nesting habitat. This is the goal behind allocating 25% of annual breeding habitat creation acres towards "experimental" or "non-traditional" approaches.

Sustainability Concerns with Traditional KW Management

Over the past 5-10 years there have been increasing concerns, from agency staff as well as the research community, voiced over the sustainability of traditional KW habitat management in the northern Lower Peninsula. These are broadly grouped into financial/economic and ecological sustainability concerns.

Concerns over financial sustainability primarily arise from the fact that jack pine grown in the core KW habitat area of the northern Lower Peninsula is a low value product, thus planting of thousands of acres of working forest lands to pure jack pine limits revenues achievable from future timber sales. This problem is compounded by the fact that KW plantations are planted at a higher density than would be used for a plantation grown for forest products – meaning that production of merchantable timber is delayed compared to a plantation planted on a wider spacing. Since the 1980s KW habitat has been created through harvesting of 60+ year old jack pine stands, often with an important component of high-value red pine. Such stands are all but gone from USDA-FS and MDNR lands in the core KW habitat areas. Thus these agencies are now faced with having to conduct timber sales on the oldest of the opposing-wave plantations, in many cases 10-15 years earlier than the planned rotation age of 50 years. These stands will produce much less sawtimber and pulpwood, and more dirty chips, compared to the 60+ year old parent stands that were available from 1980 through the early 2000s. These changes in stand structure and composition across the landscape, in combination with stagnant markets for jack pine sawtimber and pulpwood and declining markets for dirty chips, will lead to declining timber sale revenues associated KW habitat creation. Another important concern with respect to financial sustainability is the high cost of establishment of opposing wave plantations, which involves heavy equipment for site preparation, purchase of nursery stock and labor costs for hand planting.

Concerns over the ecological sustainability of the current approach to KW breeding habitat management are best viewed through the lens of "Ecological Forestry," whose central

tenet is that the sustainability of biodiversity and multiple ecosystem services is best achieved by designing management systems that closely mimic the intensity, timing and effects of natural disturbance regimes. Opposing-wave plantations do a good job of creating early-successional habitat with a mixture of openings and closed forest; however, they fail to emulate important stand-level features of natural fire-regenerated jack pine stands in several important ways:

1. Fire-regenerated jack pine stands have legacy structures of dense snags and downed trees that are not replicated in plantations following clear cutting.
2. Fire-regenerated stands have highly heterogeneous patch structure that is quite distinct from the uniform patch structure of opposing-wave plantations.
3. Establishment of opposing wave plantations by trenching and planting represents a major soil disturbance that does not occur in fire regenerated stands.

At the landscape-scale there are other important ecological concerns over the current approach to habitat management:

1. Widespread planting of nursery stock has likely promoted uniformity in the population genetic structure of jack pine in the core habitat area, compared to natural regeneration following wildfire, or even seed regeneration following harvesting.
2. Continual harvesting and planting of new stands has shifted the stand-age distribution across the landscape to a far greater representation of younger age classes compared to what was present prior to KW recovery efforts, and in all likelihood compared to what was present prior to European settlement of the region. Based on reconstructions of pre-settlement fire regimes it is likely that, averaged over time, 1/3 of the core KW habitat area was occupied by jack pine stands 60 years old or older. This raises the concern of whether there are species or ecological processes that are dependent on these older stands that are being impacted by current management.

Assessment of Threats

The financial and economic concerns outlined above represent a near-term threat to Kirtland's warbler to the degree that they impact agency budgets for creation of new breeding habitat. They also may have significant impacts on habitat management post delisting if they will necessitate more fundraising to support breeding habitat management as timber-sale revenues decline.

The ecological sustainability concerns outlined above do not represent a direct threat to the Kirtland's warbler. However, Kirtland's warbler breeds on lands managed by public agencies whose missions are to manage for a multitude of important values in addition to KW, including timber production, recreation, aesthetics, conservation, etc. The immediate crisis of impending extinction has passed, now is the time to develop a new approach to KW management that is more compatible with sustainable, multiple-use management of state and federal forestlands in the northern Lower Peninsula.

II. Action Plan

Most of the Financial Sustainability/Experimental Habitat working group met for a discussion on February 16, 2017. This discussion was primarily focused on the issue of “experimental acres” but delved into all of the issues outlined above. Based on that discussion we have identified the following action items:

1. Develop a new definition of “traditional habitat management” that is meant to encompass 75% of the agencies’ acreage objectives. The KW Breeding Range Conservation Plan states that “Traditional management is considered to be ‘opposing wave planting,’ typically used in the northern Lower Peninsula of Michigan...” However, forest managers from MDNR and USDA-FS on the working group were in unanimous agreement that this definition needed to be expanded to include breeding habitat created from harvested sites using natural regeneration methods, as well as wildfire-regenerated habitat as it occurs. There was a consensus that our group should develop a definition for this 75% acreage that quantifies those characteristics of proven, high-quality KW habitat capable of supporting the bird densities assumed in Table 2 of the Breeding Range Conservation Plan. Phil Huber and Keith Kintigh are taking the lead on developing an initial draft. This will be discussed and approved by our working group and then presented to the entire KWCT.
2. Develop a systematic framework for an adaptive management approach for the “experimental acres” – the 25% of agency acreage objectives that can be used to test new approaches to habitat creation. To date, activities associated with these experimental acres have been carried out on an ad hoc basis with little or no coordination across agencies. An important task for the working group is to develop a more coherent and systematic adaptive management approach for activities on the 25% experimental acres. We have not yet identified leaders for this effort.
3. Continue work on the planning document template, further developing goals, strategies and plans for implementation.