

# Lake States Fire Science Consortium

A JFSP KNOWLEDGE EXCHANGE CONSORTIUM



## BIRD COMMUNITIES AND STRINGERS

Written by: Shelby A. Weiss  
(Applied Sciences Program, Seney NWR)

“Stringers” are linear patches of mostly live trees left behind following a fire. Fire behavior in jack pine (*Pinus banksiana*) ecosystems often produces these narrow strips running parallel to the direction that fire spreads. Stringers may play an important ecological role as refugia for wildlife, providing cover and food that cannot be obtained from adjacent areas. Information on jack pine stringers is particularly important because current management for the Federally Endangered Kirtland’s Warbler (*Setophaga kirtlandii*) consists of clearcutting jack pine and replanting jack pine seedlings to produce conditions that stand-replacing wildfire once did. For this study, researchers in northern Lower Michigan investigated if stringers had unique bird communities compared to surrounding forests or plantations, and how much of the variation in bird communities between stringers and non-stringers could be explained by differences in the vegetation structure and composition.

To explore these questions, point counts were conducted from 50 stations at seven sites in both the breeding and non-breeding seasons, with two primary sites located within the U.S. Fish and Wildlife Service’s Kirtland’s Warbler Wildlife Management Area. Sites were grouped by the time since disturbance as: “recently disturbed” (4-12 years since disturbance that created the stringer), “intermediate aged” (30-40 years since disturbance), and “mature” (over 40 years since disturbance). Species abundance, richness, and diversity within stringers and non-stringers were compared among these disturbance age classes. Data were also collected on vegetation structure and composition for stringers and non-stringers, and Non-metric Multidimensional Scaling (NMDS) was



### MANAGEMENT IMPLICATIONS

- 1) Stringers play an important role for bird communities of jack pine (*Pinus banksiana*) forests of lower Northern Michigan, offering refugia and resources not available in surrounding recently disturbed areas.
- 2) Characteristics of stringers (closed canopy, mature pine/deciduous trees, snags) are preferred by different bird species than those that occupy recently disturbed, non-stringer areas.
- 3) Differences in vegetation structure drive bird species composition in stringers vs. non-stringers, particularly when disturbance is recent.

#### Want to learn more?

Greg Corace  
Seney National Wildlife Refuge  
greg\_corace@fws.gov; 906-586-9851 x14

used to analyze how bird species responded to differences in vegetation of stringers and non-stringers.

Stringers had a more closed canopy, were composed of mature pine and deciduous trees, and contained more snags relative to non-stringer vegetation. Overall, 57 bird species were observed across the 50 point count stations. At recently disturbed sites, bird assemblages differed between stringer and non-stringers in the breeding season, but not for sites older than 12 years. In general, intermediate aged and mature sites were composed of similar bird species. Differences in bird species were driven by vegetation structure when the disturbance had recently occurred, most likely because this was when vegetation structure differed the most between stringers and non-stringers. Over time vegetation became similar in stringers and non-stringers, and bird communities similarly converged.

This study suggests that stringers play an important role for bird communities in jack pine ecosystems of northern Lower Michigan, especially when the surrounding non-stringer landscape has been recently disturbed either through clearcutting or fire. For this reason, it is recommended that managers consider including stringers in their silvicultural prescriptions as an effective way to maintain site-level avian biodiversity while also providing the altered vegetation structure suited for Kirtland's Warbler breeding habitat.

#### Reference

*Cullinane-Anthony, B. L., N. E. Seefelt, R. G. Corace III, D. M. Kashian, and T. M. Gehring. 2014. Influence of residual forest patches on post-fire bird diversity patterns in jack pine-dominated ecosystems of northern Lower Michigan. Forest Ecology and Management 331:93-103*