Incorporating forest-wildlife interactions into reforestation guidelines for boreal Alaska

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Abstract:

1. ADF&G recently helped DNR Forestry develop best management practices for wildlife habitat that facilitate reforestation on state, municipal, and private lands in boreal Alaska.
2. Substantial mutual benefits can come from coordinating forest practices and wildlife habitat conservation in managed forests.

Advantages of applying forestry and wildlife Best Management Practices

Wildlife conservation can facilitate forestry objectives.

Forestry practices can maintain habitat for wildlife.

Public benefits from collaboration:

Maintaining a diversity of wildlife species in managed forests can promote forest growth and avoid de-stabilizing ecological processes.

Background

ADF&G helped Alaska Division of Forestry collaboratively review reforestation practices in boreal Alaska (Fig 1).

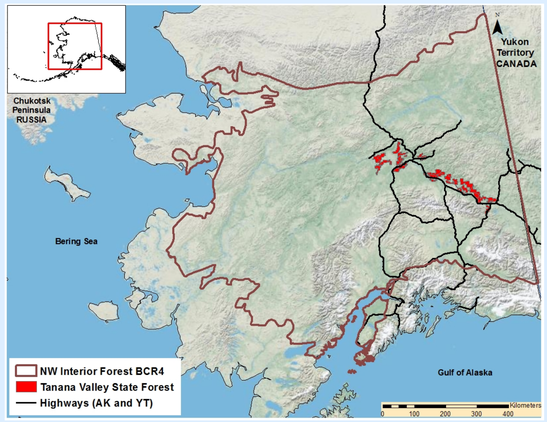

Figure 1. Location of boreal forest in Alaska as depicted by Bird Conservation Region (BCR) 4 of the North American Bird Conservation Initiative.

The Alaska Forest Resources and Practices Act (FRPA) provides standards for timber operations on state, private and municipal lands, but guidance is limited or voluntary for wildlife (Alaska Statute 41.17.910) : "Allowance shall be made for important fish and wildlife habitat" (AS 41.17.060(c)).

ADF&G developed wildlife recommendations as part of an interdisciplinary Scientific and Technical Committee. An Implementation Group endorsed the work, which will be achieved via landuse planning and training of agency staff and operators.

More information

http://forestry.alaska.gov/forestpractices

(see *Reforestation Standards Review - Regions II and III*).

Stand-scale benefits of understanding forest wildlife ecology

✓ REDUCE HERBIVORY RISK

- Retain late-seral features such as tree cavities and dead wood promote insectivorous birds (Fig. 2), raptors, owls (Fig. 3), and mammalian predators that reduce herbivore damage to trees and seedlings. Mammalian predators (marten, fox, lynx) are also a resource for fur trappers.

Figure 2. American Three-toed Woodpecker (*Picoides dorsalis*) feeding on spruce beetle larvae. (From: utahbirds.org)

- Understand wildlife population dynamics to avoid replanting during peak herbivore abundance (e.g. hare cycles), thus reducing seedling and sprout depredation.
- Isolated harvest patches can pre-dispose reforested sites to intense herbivory (see Landscape-scale considerations).

Figure 3. Predators like Great Horned Owls (*Bubo virginianus*) can reduce snowshoe hare herbivory.

✓ FACILITATE TREE GROWTH

- Maintain habitat for flying squirrels (Fig. 4) and voles so their feces, which contain spores of beneficial mycorrhizal fungi, can re-inoculate soils. Retain tree cavities and "witches brooms" for flying squirrels, as well as woody debris for vole security cover.

Figure 4. Northern flying squirrels (*Glaucomys sabrinus*) eat fungi that provide mycorrhizal spores for tree roots.

Next steps: Landscape-scale considerations

- Timber harvest could mimic landscape patterns of natural burns by retaining "habitat islands" within larger logged areas to mimic unburned patches with late-seral forest (Hunter 1993).
  - o Within these islands, we would seek to maintain late-seral habitat (cavity trees, snags) for predators and fungal spore dispersers.
  - o Forest inventory data may help us understand spatial patterns of habitat where wildland fires dominate upland disturbance. This could inform optimal layout of timber sales.
- We encourage collaborative research in an **adaptive management** framework (Walters and Holling 1990) to evaluate whether wildlife and timber objectives are met through best practices.

References

Hunter, M.L., Jr. 1993. Natural fire regimes as spatial models for managing boreal forests. Biological Conservation 65:115-120.

Walters, C.J. and C.S. Holling. 1990. Large-scale management experiments and learning by doing. Ecology 71:2060-2068.

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