

Synopsis of
"The Influence of White Fir Invasion and Road Presence on Ponderosa Pine Bird
Communities in the San Juan National Forest"

This study was conducted on the Pagosa Ranger District by the Colorado Bird Observatory in June 1996. Will use results from this study to educate the public on the potential effects to wildlife from the proposed Little Jackson Timber Sale.

STUDY SITES AND METHODS

Location

- Turkey Creek, Big Branch, Kenney Flats, Turkey Springs, Devil Creek, Trail Ridge, Williams Creek White Fir Natural Area, and Cade Mountain areas

878 points of analysis

- 386 on-road
- 492 off-road
- 8418 individuals comprising 84 species were documented

Points classified as

- Ponderosa pine = 326
- Ponderosa pine/white fir = 294
- Fir (white fir and Douglas fir) = 125
- Other species (pure aspen or Engelmann spruce/subalpine fir) = 92

RESULTS

Ponderosa pine community

- Birds that were found in open stands of pine and not in any other forest type included: Lewis' woodpecker (non-migratory), Tree Swallow (migratory), and Western Bluebird (non-migratory)

Pine/fir community

- No species was unique to this forest type. Broad-tailed Hummingbird (migratory) and Hairy Woodpecker (non-migratory) were species encountered most often in this type

Fir community

- No species was restricted to fir stands
- Species showing a preference for fir or pine/fir stands included Black-headed Grosbeak (migratory), Brown Creeper (non-migratory), Cordilleran Flycatcher (migratory), Hammond's Flycatcher (migratory), Mountain Chickadee (non-migratory), Orange-crowned Warbler (migratory), Pine Siskin (non-migratory), Red Breasted Nuthatch (non-migratory), Ruby-crowned Kinglet (migratory), Warbling

Vireo (migratory), Western Tanager (migratory), and Yellow Rumped Warbler (migratory). All species are associated with aspen and/or spruce-fir forests

Overall

- Average number of individuals observed per point was highest for fir stands, followed by pine/fir stands, and pine stands
- Fir community supports more individuals possibly because of the multi-storied structure that provides greater habitat diversity
- Change in community composition can be seen in nest site preferences
 - Ponderosa pine stands had the highest amount of ground nesting birds
 - Shrub nesters changed little across the community types due to shrubs of varying species occurring across the different types
 - Tree nesters were greater in fir stands mostly due to the aspen component
 - Percentage of cavity nesters was highest in pine/fir community, probably because this community is intermediate between ponderosa pine and fir communities in habitat, and includes cavity nesters from both

Implications of type conversion

- As conversion of forest type progresses from ponderosa pine to pine/fir and then to fir, the avian community follows the trajectory
- As white fir closes the canopy and fills the undersotry in ponderosa pine, it restricts the suitability of the forest for birds of open habitats, such as Western Bluebirds
- Loss of Gambel oak cover reduces the suitability of habitat for birds such as Virginia's Warbler (migratory)
- At the same time, the influx of white fir and associated tree species creates opportunities for birds of higher-elevation, closed forests such as Red Breasted Nuthatch
- Many species are common to 2 or all 3 of the communities, differences in suitability of each are expressed in changes in each species' occurrence across forest type
- Thus, there is not a wholesale substitution of one avian community for another, but a gradation between forest types

Impact of Roads

- Seven bird species common at on-road census points than off-road included: American Robin (ground feeder, migratory), Broad-tailed Hummingbird (aerial feeder), Green-tailed Towhee (ground feeder associated with shrubs, migratory), MacGillivray's Warbler (associated with shrubs, migratory), Pine Siskin (foliage and ground feeder), Red-breasted Nuthatch (tree limb and trunk gleaner), and Western Wood Pewee (aerial feeder, migratory). The primary reason for this is due to the condition of the habitat, and actions that occurred creating the habitat. Road width did not seem to matter
- One bird, pygmy nuthatch showed a negative response to roads due to the lack of ponderosa pine presence for feeding and lack of snags for nesting

- Other studies were in agreement with this study showing the presence of roads contribute to higher populations of species associated with open forest, brushy habitat, or edges

Implications of white fir removal

- Species dependent on open stands would increase while those dependent on closed stands would decline
- The status of shrub-dependent species would depend on the management prescription implemented (i.e., the amount of shrub cover removed particularly oak)
- Removal of white fir would result in the removal of birds that favor fir, and changes in the population levels of other species – the shift in avian community will parallel the shift in the forest from fir or pine/fir type to ponderosa pine type
- The ponderosa pine/white fir avian community (Yellow-rumped Warbler, Western Tanager, Mountain Chickadee, Warbling Vireo, Orange-crowned Warbler, Chipping Sparrow, Ruby-crowned Kinglet, and others) would give way to the ponderosa pine community (Chipping Sparrow - migratory, Dusky Flycatcher - migratory, House Wren - migratory, Green-tailed Towhee - migratory, Pygmy Nuthatch, American Robin, and others) which includes many of the same species as above, but at different population levels
- This all assumes that species specific logging would remove only white fir, and perhaps Douglas-fir, and that ponderosa pine in all size classes would be left standing, as would ponderosa snags

Species of concern (SOC) benefiting from white fir treatment in ponderosa pine/fir communities include:

- Pygmy nuthatch (previous R2 SS)
- Flammulated owl (R2 SS, BCC, & PIF) (migratory)
- Lewis' woodpecker (R2 SS, BCC, & PIF)
- Grace's warbler (PIF & BCC) (migratory)
- Band-tailed pigeon (PIF) (migratory)

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