A PROPOSAL TO STUDY THE IMPORTANCE OF SNAGS TO SPECIES ABUNDANCES OF BIRDS IN A BURNED AND UNBURNED LODGEPOLE PINE (*PINUS CONTORTA*) COMMUNITY.

BY:

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I. PROBLEM STATEMENT

The forest has many primary excavators and secondary excavators that have specific requirements for snags. The numbers and characteristics of snags directly affects the population levels of cavity-nesting birds (Raphael and White, 1976).

A wildlife snag is "any dead tree or partly dead tree at least 10.2 cm in diameter at breast height and 1.8 cm tall as a minimum used for birds in nesting" (Thomas et. al. 1979). Snags are used by birds in nesting, drumming, roosting, and as hunting, lookout and loafing perches, food caches, nest material, plucking posts and feeding (Miller and Miller, 1980).

Birds are dependent upon snags. There are 39 birds and 23 mammal species that use the snags (Thomas et. al. 1979). With a change in snag density the bird species diversification will also change. Cunningham et. al. (1980) found that the violet-green swallow (Tachycineta thalassina), pygmy nuthatch (Sitta pygmaea), mountain chickadee (Parus gambeli) and brown creeper (Certhia familaris) nested predominately in snags. Balda (1975) found that the western fly catcher (Empidonax difficilis), western bluebird (Sialia mexicana), pygmy nuthatch (Sitta pygmaea) and house wren (Troglodytes aeden) were very sensitive to snag removal.

If not enough snags are left the birds will either leave the

site or they will use substandard trees which are more susceptable to predation and hazards (Miller and Miller, 1980).

II. JUSTIFICATION

Research is needed to better understand the relationship of cavity-nesting birds and snags to a healthy environment. If these species are reduced or eliminated due to a lack of nesting sites this will inevitably effect the whole ecosystem. Research is needed on different timber types and different geographic locations.

One timber type that has seldom been studied is the lodgepole pine community and especially its effects of habitat disturbances on bird populations (Hein, 1980). Primary cavity-nesting birds, followed by secondary cavity-nesting birds play an important role in the succession of a burned site. According to Taylor and Barmore Jr. (1979), three-toed woodpeckers in a burned site start a "tree hole nesting cycle" and that cavity-nesting birds make up 29-64 percent of the total breeding birds in a 5-29 year post burn site. In order to keep these bird populations at a healthy level, research is needed.

From an economic standpoint cavity-nesting birds play an important role in regulating the insect populations at endemic levels (Barnes et. al. 1973).

In this work I hope to find a relationship between snags, cavity-nesting birds and the bird population as a whole in a burned and unburned lodgepole community.

III. OBJECTIVES

1. Compare species abundances of cavity-nesting and other species of birds in a burned and unburned lodgepole pine community.

2. Determine snag densities of the plots in Lodgepole pine and post-burn Lodgepole pine communities in the Chamberlin Basin area.

3. Quantitatively assess snag characteristics including species, height, dbh, soundness, bark condition, limb abundance, lean, relative age, top condition, number of natural holes, and the number of observed nests.

4. Identify snag characteristics associated with use by cavity-nesting birds.

5. Compare bird species abundance in a post-burn community to that of a controlled community of Lodgepole pine.

6. Compare relationships of bird species to the abundance of cavity-nesting bird species in a burned and unburned site.

IV. LITERATURE REVIEW

Research has already been done in different forests of the U.S. A three year study in western larch (Carnix occidentalis) and Douglas-fir (Pseudo tsugamenziesii) in the northeastern forests of Montana was done on wholenesters and their preference to snags. Thomas et. al. (1980) did a study in the Blue Mountains of Oregon and Washington on the requirements of snags to wildlife. Gale et. al. (1973) wrote up coordinated guidelines for snag management in wildlife habitats and also studied the effects that logging had on snags in the Klamath and Modoc National Forest. He then calculated the minimum, average number of snags per acre. An inventory study was done to determine the response of non-game birds and small mammals to timber harvesting on Englemen spruce (Picea engelmannii), subalpine fir (Abies lasiocarpa), and lodgepole pine (Pinus contorta). The minimum number of dead and dying snags per acre required to support a population of secondary cavity-nesters was specified by Balda (1975). Hardin and Evans (1977) received, analyzed and published information on habitat selection of cavity-nesting birds and related it to forest management in a oak-hickory forest. A study was also done on the effects of a post-fire succession

on avian populations in a coniferous forest. It was found that primary cavity-nesting birds were very important on paving the way for forest succession (Taylor and Barmore Jr., 1980). A study on cavity-nesting birds in a burned plot of pine-fir was done by Raphael and White (1976). They found that cavity-nesting birds represent 27.8 percent of the population on an unburned site and 36.6 percent on a burned site.

V. METHODS

At the end of May I will arrive in the Chamberlin Basin area. The first week will be spent setting up transects and plots, and familiarizing myself with the area and birds. Three random transects for snag censusing will be taken from the control site (unburned) and two transects will be marked off with the use of flags or paint and will be selected from an air-photo map. Ten circular plots of one-tenth of an acre will be selected at regular intervals of 30m on the transects.

The second week I will hike into the burned area and set up camp. One-half hour after sunrise I will start the bird census using the spot-map method (Franzieb, 1976). The census will last approximately two hours. Three square plots of 20 acres will be selected for bird censusing in the unburned community and two square plots in the burned community. Each plot will be visited five times. Audial and visual cues will be used. During the rest of the day I will census snags in the plots on the transects. Characteristics of the snags in each circular plot will be recorded as follows:

a) by species, which will be determined by bark characteristics and by the surrounding tree species.

b) by dbh, which will be measured by dbh tape.

c) by height, which will be determined with a clinometer.

d) by soundness, which will be labeled on a scale from one to four with one being the hardest. A hard snag has sound wood with no signs of decay. A soft snag with a rating of four will show much signs of decay.

e) by limb abundance, which will be labeled as absent, present with less than 50 percent, and present with more than 50 precent.

f) by relative lean, which will be determined by a hand protractor held up to the tree at a distance.

g) by top condition, which will be classified as an intact top, broken top with more than 50 percent gone and broken top with less than 50 percent gone.

h) by the number of natural holes, active nests, and presence of feeding.

After the two weeks are up I should be finished with the burned data and will hike down to the unburned site to start the same procedure there. Collecting the data for the two sites should take about six weeks. I will then spend the rest of my time analyzing the data.

VI. ANALYZING THE DATA

The questions that will be asked are:

1. Which site possesses more snags?

I will use the sample mean as an estimation of the whole population. The mean will then be calculated along with the standard deviation. The different means on the circular plots will then be compared by use of the analysis of variance (Lapin, 1980). The means will then be compared between the two sites.

2. Which characteristics of snag predominate as associated with use?

The numbers of snags that showed use will be tallied up and compared with the numbers of each characteristic that appeared in those snags. This will show which characteristics predominate and which ones that seem to appear only randomly. A comparison will then be made as to which characteristics predominate as a whole to each site,

in relation to use.

3. Which site has more cavity-nesting birds?

The sample mean will also be used as an estimation for the whole bird population. The mean and standard deviation will be calculated for the different plots and the mean will be compared by using the analysis of variance (Lapin, 1980). The same procedure will also be applied to the cavity-nesting birds and the other species, respectively. The means will then be used in comparing the two sites. A comparison will also be made to the relationship of cavity-nesting birds to the other birds on the two sites.

4. Species diversification will be compared by making a list of all the different species that were sited on the two sites.

VII. LIST OF EQUIPMENT

1. Paint or flags
2. Clinometer
3. Protractor
4. Field glasses
5. dbh tape
6. Air photo
7. Compass

VIII. STUDY AREA

The study area is located within the Idaho Primitive Area which surrounds 5,200 roadless square km which continues to the south of the Salmon river. Between 1,400 and 2,300 m in the north lies the gently rolling, timbered hills of Chamberlin Basin (Seidensticken IV 1973). Several creeks, the Queen, Deer, Dog, Lodgepole and Little Lodgepole cut into the area in a dendritic pattern and feed

into the Chamberlin creek which runs to the Salmon River. The Chamberlin ranger station and Lodgepole Point are the two prominent landmarks.

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