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1920 Land and Resource Management Planning
2620 Wildlife and Fish Resource Planning

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Wildlife Resource Planning Assistance To the Payette and Boise National Forests

Assistant Director, LMP

On February 22 and 23, 1983, in McCall, Idaho, I assisted Forest personnel in wildlife resource planning related to Payette and Boise National Forest planning. I was invited by the Payette National Forest. Participants besides myself were: John Skinner, Planning Branch Chief; Jim Gacy, Wildlife Biologist; Dave Burns, Fisheries Biologist; and Steve Ryberg, Operations Research Analyst, all of the Payette National Forest; Al Boss, Wildlife Biologist, Boise National Forest; and Gary Powers, Idaho Fish and Game Department.

Assistance was provided in two major subject areas:

1) development of a procedure to determine viable wildlife population levels on the forests, compatible with requirements of the Forest Service Planning Regulations (36 CFR 219.19 and 219.27); and,
2) recommendation of a general procedure for the forests to incorporate wildlife population and habitat objectives in Version II of FORPLAN.

This memorandum documents the results of the meeting by major subject.

## Procedure to Determine Viable Population Levels

### Requirements and Concepts

The procedure was based on the following considerations from 36 CFR 219.19:

1. the requirement to manage habitat to maintain viable populations of vertebrates in the planning area;

2. the definition of a viable population; and,

3. the requirement for habitat for at least a minimum number of reproductive individuals and for distribution of that habitat assuring interaction among demes (supopulations) in the planning area.

In accordance with the requirement in item 1 above, the quantity and quality of wildlife habitat to be provided on national forests through plans, must relate to specific viable population levels. A working understanding of population viability is, therefore, a prerequisite to integrating wildlife habitat objectives into forest plans. Conservation implications of the viable population concept are discussed by Cruze (1983) and Salwasser and Hoekstra (in prep).

In the Planning Regulations, a viable population is defined as "one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area". The fundamental requirement of the definition is that a population's continued existence is well distributed in the planning area. By inference, "well distributed" has been defined in Forest Service policy to mean a population's unceasing presence "throughout its existing range in the planning area" (Hilmon 1982). Secretary of Agriculture Policy on Fish and Wildlife (Block 1982) supports this notion by requiring that habitat must be provided .... "to ensure the continued existence of a species throughout its geographic range."

Reproductive individuals, distributed throughout the population's existing geographic range in a national forest is a necessary condition for population viability. As a consequence, numbers of reproductive individuals per population (per forest) may vary from the minimum necessary to maintain the demographic resiliance of demes (see Cruze 1983:13) distributed throughout the population's existing range, (minimum population size) to the maximum biological potential (maximum population size).

The distribution requirement for the population determines the distribution requirement for the habitat. Habitat to insure the maintenance of viable populations may vary from that sufficient for minimum populations to that sufficient for maximum populations. Habitat for all populations must be "well distributed" such that members of different demes can interact. The actual spacing of capable habitats is determined by the size of demes and the dispersal capabilities of its members.

Procedure

A step-by-step procedure was developed to determine viable population levels. Steps reflect major requirements and concepts of the Planning Regulations. They apply for each management indicator species (MIS).

Step 1 - Define well distributed population. (Well distributed equates to the population's existing geographic range in the planning area.)

Step 2 - Specify required deme characteristics. (Sets of characteristics are stated including number, sex ratio and age structure. Sets can vary from the minimum which provides reasonable assurance that each deme can at least persist and colonize, to the maximum compatible with habitat carrying capacity and/or social tolerance of the population.)

Step 3 - Describe habitat requirements. (Describe the habitat conditions (quantity and quality) required for each set of deme characteristics. Habitat conditions should be described in terms of plant communities and successional stages (Thomas et al. 1979; Mealey and Horn 1981), habitat dispersion (Thomas et al. 1979; Mealey et al. 1982) and special and unique habitats (Thomas 1979).)

Step 4 - Define well distributed habitat. (Well distributed habitat is the amount and location of required habitat which assure that individuals from demes, distributed throughout the population's existing range, can interact. Habitat should be located so that genetic exchange among all demes is possible. Demes should be spaced so that none is greater than 1 maximum dispersal distance from at least one other deme.)

Step 5* - If appropriate, for the MIS,** calculate the long-term minimum viable population number for evolutionary fitness in the planning area (Salwasser and Hoekstra in prep:58).

Step 6 - Determine final numbers and distribution. (The sum of all individuals of all demes must equal or exceed the minimum viable population number).

*Salwasser (WO-WL/F) recommends the following:

a. omit step 5; and,
b. change step 6 to 7 and add the following steps 5 and 6:

5. Estimate the probability for persistence of the population in the planning area resulting from an aggregation of demes distributed throughout the population's existing range.

5. Estimate the probability for persistence of the population in the planning area resulting from variation (reduction) in the number of demes.

** Some populations of species, such as grizzly bears, wolves, and woodland caribou have home ranges encompassing more than one national forest. For these species, the minimum viable population number is determined for the entire range.

The five steps were applied to four hypothetical cases.

Case 1 - MIS-Elk; population - minimum
Case 2 - MIS-Elk; population - maximum
Case 3 - MIS-Piliated Woodpecker, population - minimum
Case 4 - MIS-Piliated Woodpecker, population - maximum

Case 1:

Step 1 - All major summer and/or winter habitat use patterns will be maintained.

Step 2 - 25 elk per deme
80:100, adult/sub-adult
37:100,adult male/adult female

Step 3. - At least 1 deme per summer/winter range complex. Demes spaced such that none is greater than 1 maximum dispersal distance (15 miles) from at least one other deme.

Case 2:

Step 1 - Same as Case 1 except that potential unoccupied habitat will be occupied.

Step 2 - 350 elk per deme
60:100, adult/sub-adult
20:100, adult male/adult female

Step 3 - Demes spaced at the highest density within the tolerance of the carrying capacity.

Case 3:

Step 1 - In general, current use patterns will be maintained.

Step 2 - 1 breeding pair

Step 3 - At least one pair per general current use area. Pairs spaced such that none is greater that 1 maximum dispersal distance (6 miles) from at least one other pair.

Case 4:

Step 1 - Same as Case 1 except that potential unoccupied habitat will be occupied.

Step 2 - 1 breeding pair

Step 3 - Pairs spaced at the maximum density compatible with territorial needs of individual breeding pairs.

The practicality and usefulness of the procedure will be tested by the Boise and Payette Forests. The technical adequacy of the procedure will be tested by WO-LMP and WO-WL/F.

## General Procedure to Incorporate Wildlife Population and Habitat Objectives in Version II of FORPLAN

### Background

Version II of FORPLAN is the forest planning model used by the Boise and Payette National Forests. The Payette NF is stratified into approximately 250 coordinated allocation zones (CAZs) which range in size from 5,000 to 15,000 acres. Coordinated allocation choices, (CACs) including some with wildlife emphases were developed for CAZs, however, specific wildlife activities (MIH codes C02-C04), outputs (MIH codes W38 - W50) and associated costs and prices were not developed for the choices. Minimum population sizes were not considered in CACs nor were there any controls on timber activity scheduling to provide habitat dispersion and vegetation age class distribution required by viable populations.

### Procedure

As with the preceding procedure (Procedure 1), a stepwise method was developed to incorporate wildlife population and habitat objectives in Version II of FORPLAN.

Step 1 - Apportion population numbers among CAZs. (For both minimum and maximum or other population levels determined through Procedure 1, assign to each CAZ the numbers of individuals or demes which must be supported.)

Step 2 - Specify habitat requirements. (For each CAZ, for each target population specify the required habitat conditions.)

Step 3 - Specify practices and/or constraints necessary to achieve habitat requirements. (Specify activities and associated practices and costs, applicable on a per acre basis, necessary to provide habitat requirements on CAZs. For each CAZ, specify constraints and/or activities and associated practices and costs, applicable area wide, necessary to achieve the required mix of successional stages. For each CAZ, specify also the accessibility constraints necessary to achieve the required habitat dispersion.)

Step 4 - Specify outputs and prices. (For each CAC, specify the outputs and associated prices resulting from practices which achieve required habitat conditions.)

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S.P. Mealey

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Pileated Woodpecker

Documentation

Goal: To establish a viable population of pileated woodpeckers well distributed throughout the planning area.

Pileated woodpeckers have been designated as a Management Indicator Species (MIS) representing the old growth component of the Forest ecosystem. I realize that the woodpecker is not an obligate of old growth but prefers old growth.

Habitat requirements of the pileated woodpecker identified from the literature vary from 100 to 600 acres. At first, researchers believed that all of the habitat should be in old growth, However, recent publications indicate the woodpecker will (and does) use the mature forest component for breeding and feeding purposes (Thomas et al 1979). In fact, none of the species listed by Thomas (edit. 1979) are obligatory to the old growth component. Therefore, I believe a mix of old growth and mature forest successional stages may be used for pileated woodpecker habitat.

The smallest territory reported for the woodpecker was 100 acres (Thomas et al 1979). (I believe this 100-acre size may be used as the old growth part of the old growth/mature forest mix. Based on this, I believe 100 acres of old growth and 200 acres of mature forest should be allocated as the habitat requirements for the pileated woodpecker. (The definition of old growth and assumptions regarding old growth may be found in previous documentation for the Forest Plan. Basically, the definition is a quote from Thomas (et al 1979).

We invited Steve Mealey, (a wildlife biologist working in Land Management Planning for the WO and stationed at Ft. Collins) to the Forest to help the Forest solve problems associated with the "minimum viable population (MVP) concept.

The MVP concept is not required in the regulations; however, a viable population is (Steve was emphatic on this point). A minimum resource standard should be developed for each resource. A minimum resource standard related to a viable population of MIS well distributed in the planning area is required. During the meeting with Steve, a process was established whereby the minimum resource standards could be defined and provided (enclosed).

Following this process, I went through the following steps:

1. Established current distribution of pileated woodpecker habitat in the planning area. (The planning area includes the River of No Return (RONR) Wilderness).

2. Determined the maximum dispersal distance for pileated woodpeckers.

3. Made the assumption that if the habitat was available the woodpeckers were there or had been there.

4. Set up a system to cover the planning area with circles 2½ miles in radius or 5 miles in diameter.

5. Assumed (as a minimum resource standard (habitat for at least one pair of pileated woodpeckers was required per circle.

6. Determined the population needed in the planning area to maintain long-term genetic fitness or viability (according the Solue and Wilcox (1980) (250 pair).

7. Totaled up the number of woodpecker pairs from the well distributed circles (232). The number of pairs of woodpeckers from the aggregation of circles had to equal or exceed the population developed in step 6.

8. Assumed the 18 pair needed to reach 250 pair could be accounted for in the RONR wilderness.

9. Overlaid the circles over the suitable/nonsuitable timber map.

10. Assumed that large areas of nonsuitable lands would meet woodpecker habitat requirements.

11. Identified circles where nonsuitable areas were lacking.

12. Checked several areas with nonsuitable lands to see if they were suitable for pileated woodpecker habitat.

13. The 41's did provide habitat for the woodpeckers (100 continguous acres of strata 23, 26, or 27 that were put in the unsuitable 41 category).

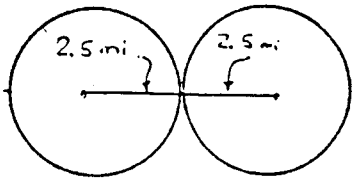
Those circles without nonsuitable lands to consider meant we had to go into suitable timber lands.

14. Will map out those capability areas, subanalysis areas, and analysis areas that are assigned to the pileated woodpeckers.

I showed the process and procedures to Gary Allen and Gary Eckert. Both agree I had uniform distribution but thought it was more than the minimum would indicate as the distribution was uniform. Therefore, I decided to do further analysis.

If we assume that the center of each circle was where the woodpeckers were located, then the maximum distance woodpeckers would need to have to meet each other would be 2½ miles. This was more than the minimum resource standard (figure 1).

5 mile diamter circles




2½ miles

Figure 1

However, if the circle radius is increased to 5 miles then we would be at the maximum dispersal distance. Applying the worst case assumption analysis as required in the regulations I find the distance between pairs would be 10 miles which exceeds the maximum dispersed distance (figure 2).

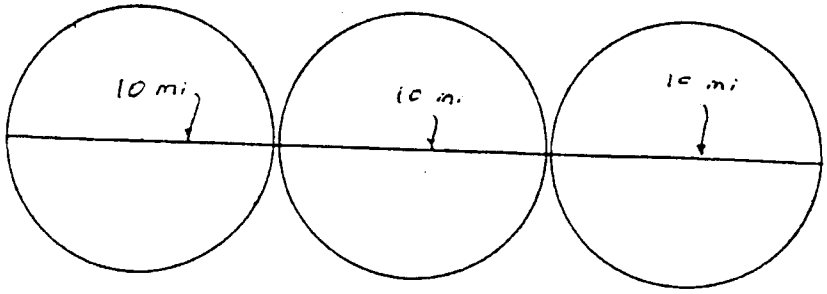



Figure 2

By requiring two pair per circle we can meet the minimum resource standard because the maximum distance between any two pair would be 5 miles (figure 3).

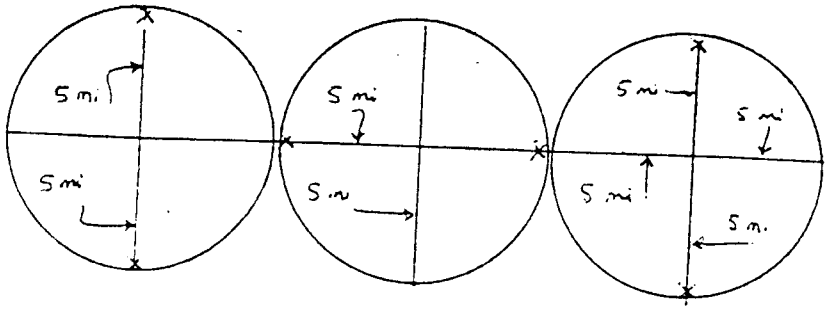



Figure 3

In the example above (figure 3) the distance between pairs within the circle would be 10 miles or 5 miles for each and the distance between pairs in the circle and the adjacent circle would be 7 miles or 3½ miles each (figure 4).

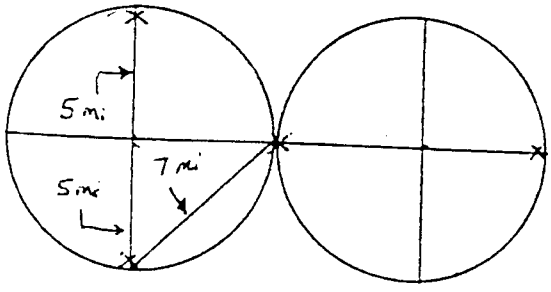



Figure 4

As one can see, the process slightly leans towards the conservative side. This should more than make up for random distribution of habitat throughout these circles.

I modified step 4 to a 5 mile radius or 10 miles in diameter circle. The procedure remained the same.

Overlaying the large circles over the suitable/nonsuitable timber map, I found five circles did not have adequate nonsuitable timber lands to provide the necessary habitat for the woodpeckers (as per step 10). These areas were identified by coordinated allocation zones (CAZ's or IRA's) and step 14 applied.

I met with Greg Spangenberg of the Cascade District of the Boise Forest on April 6 to determine which suitable areas on the Cascade District should be allocated to the pileated woodpeckers (four of the five areas were on the Cascade portion of the South Fork of the Salmon River). These areas were allocated by CAZ, capability ares, subanalysis area, and analysis area.

A process for choosing areas to allocate was developed. First, look for nonsuitable timber lands capable of providing old growth. Second, assign research natural areas, visual retention zones, etc., that are capable of providing old growth. Third, assign areas of suitable timber lands that are unlikely, although possible, to be harvested. Last, assign areas of suitable timber land that are likely to be harvested. Using this process, the first three steps were utilized but the fourth step was not.

The remaining area was allocated to the woodpecker by finding a nonsuitable area capable of providing habitat for one pair and by allocating part of a visual retention zone with a 200-year rotation for the other pair.

Fifteen analysis areas (AA's) consisting of 1,538 acres have been assigned to habitat for the pileated woodpecker. About 330 acres of this total is in nonsuitable lands with the remainder (1,208 acres) in suitable timber lands. However, most of these lands so identified are questionable choices for timber harvesting (third item in the process as mentioned above).

These acres only apply to the old growth mix of pileated woodpecker habitat. The remaining 200 acres of mature forest will be handled by standards and guidelines for those CAZ's identified.

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Enclosure

cc:
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