



## THE WILDLIFE SOCIETY

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Dale Hall  
Director, U.S. Fish and Wildlife Service  
1849 C Street, N.W.  
Washington, DC 20240

cc: Ren Lohofener, Pacific Region Director

Dear Director Hall:

The Wildlife Society is taking this opportunity to submit comments on the U.S. Fish and Wildlife Service's (FWS) Final Recovery Plan for the Northern Spotted Owl. The Wildlife Society, founded in 1937, is an international non-profit association dedicated to excellence in wildlife stewardship through science and education. The Society's membership includes nearly 8,000 professionals and students with expertise in all aspects of wildlife conservation and management.

While the Fish and Wildlife Service did not request comments on the Final Recovery Plan, The Wildlife Society feels obligated to follow up on the comments that it submitted on the Draft Recovery Plan (TWS 2007). There have been some improvements from the Draft to the Final Plan, but the underlying strategy of the Plan either remains unchanged or has been weakened from the Draft. We offer these comments in hopes that the Fish and Wildlife Service might still reconsider its Final Plan.

The Wildlife Society asked experts in population dynamics, spotted owl ecology, forest ecology and management, and fire ecology to review the 2008 Final Northern Spotted Owl Recovery Plan. The same team that provided the review of the 2007 Draft Recovery Plan reviewed the Final. Their report is submitted herein as the Society's comments on the 2008 Final Recovery Plan for the Northern Spotted Owl.

### INTRODUCTION

The spotted owl, *Strix occidentalis*, is one of the most studied raptor species in the world. More papers have been written on its habitat relationships than any other raptor (Löhmuß 2004), and the largest mark-recapture populations studies ever conducted on an endangered species have been done with the northern spotted owl, *S. o. caurina*, (Anthony et al. 2006). There is no other species listed under the U.S. Endangered Species Act for which such extensive information is available upon which to build a scientifically credible recovery plan. Although some sections of the 2008 Final Recovery Plan (hereafter 2008 Plan) are improved over the 2007 Draft Recovery Plan (hereafter 2007 Draft Plan), the Plan does not adequately avail itself of the depth and

breadth of this information, resulting in a seriously flawed plan for recovery. For the reasons discussed below, the 2008 Plan will not lead to recovery of this species. Indeed, the plan would reverse much of the progress made over the past 20 years to protect this species and the habitat upon which it depends.

The northern spotted owl has been managed on federal lands by the U.S. Forest Service (USFS) and Bureau of Land Management (BLM) following direction provided by the Northwest Forest Plan (NWFP) (USDA and USDI 1994a and b) and implemented by the relevant Land and Resource Management Plans (LRMPs), since the adoption of the NWFP in 1994. Courtney et al. (2004) reviewed the status of the northern spotted owl and acknowledged that the current strategy (large and small reserves set in an “owl permeable” matrix) was based on sound scientific principles and that the scientific support for this management strategy has not substantially changed since the species was listed as threatened in 1990. In Appendix A the 2008 Plan correctly notes a declining population trend for the owl on 9 of 13 demographic study areas and “precipitous declines” on 4 of the most northern study areas. However, the NWFP appears to have been effective in slowing this decline. The rate of decline for owl populations in the NWFP monitoring areas was about 2.4% per year compared to a rate of 5.8% per year for study areas outside the NWFP monitoring areas (Anthony et al. 2006). This result strongly suggests that a recovery plan for the northern spotted owl should be based on the NWFP and should strengthen provisions of that plan for spotted owls. Therefore, it is illogical that the 2008 Plan proposes a significant reduction in suitable habitat available to the owl, a habitat specialist.

### **Relationship of the 2008 Plan to the Northwest Forest Plan and subsequent Land and Resource Management Plans is unclear.**

The 2008 Plan is ambiguous with respect to its interface with the NWFP. The 2008 Plan (p 5, para 2) “...recognizes the required management the existing LRMPs provide for the conservation of the spotted owl.” Further the 2008 Plan states (p 13, para 2) “As a baseline it [Managed Owl Conservation Area network] assumed all other existing management plans throughout the range of the spotted owl are being implemented.” These statements imply that the 2008 Plan was devised to achieve recovery with the NWFP as a foundation. Yet (p 11, para 1& 2 and p 63 final para) the 2008 Plan indicates that changes to the current LRMPs are anticipated and that FWS will respond to new LRMPs through “plan or project level consultations to assure management actions align with recovery goals.” Further, by adopting as Managed Owl Conservation Areas (MOCAs) the BLM’s Late Successional Management Areas the 2008 Plan apparently anticipates the adoption of that agency’s preferred alternative for its Western Oregon Plan Revisions (USDI BLM 2007). Implementation of the BLMs Western Oregon Plan Revisions would have clearly negative consequences for spotted owls and their recovery. There is simply no rationale for devising a recovery plan that is dependent on existing management plans while proposing significant change to the existing plans and yet expecting the recovery plan to remain effective.

Because the 2008 Plan is not clear about the intended status of the NWFP, this review was conducted with the assumption that all provisions of the NWFP could potentially be changed by implementation of the 2008 Plan.

## **The 2008 Plan drastically reduces protection of habitat in reserves.**

As noted above, Appendix A of the 2008 Plan, which is repeated from the 2007 Draft Plan, cites the evidence of declining northern spotted owl populations. Both plans also cite evidence from Anthony et al. (2006) that the NWFP appears to have been effective in slowing these declines.

In light of this evidence, peer reviews and other outside reviews argued that the reduction in habitat protection from the LSRs in the NWFP to the MOCAs proposed in the 2007 Draft Plan was not appropriate and would not provide for recovery of the owl. Inexplicably, the 2008 Plan would reduce protection of habitat in reserves even further than had been proposed in 2007. The 2008 Plan completely eliminates MOCAs in eastside provinces and makes small reductions in the westside MOCAs (-1.4% in Washington; -2.2% in Oregon; and -0.7% in California) compared to the 2007 Draft Plan. We compare the resulting MOCAs to the LSRs of the NWFP in Table 1. There would be a 35% reduction in acres protected in reserves in westside provinces compared to the NWFP and a 100% reduction in eastside provinces. The combined total for west- and eastside provinces would be a 48% loss in acres protected in reserves. Further, table C5 in the 2008 Plan shows that only 1635 of 1,474,920 acres of existing Adaptive Management Areas (AMAs) would be protected within MOCAs. Assuming the MOCAs became the conservation network for northern spotted owls, there would be an overall reduction of 56% from the acres currently protected in AMAs and LSRs.

The 2008 Plan argues that the MOCAs were based on the 1992 Draft Final Northern Spotted Owl Recovery Plan because it was “the most recent spotted owl-specific analysis of habitat needed to provide for a sustainable population of spotted owls across the species’ range” (2008 Plan, Appendix C:70). This contention is false. The LSR network developed by the Forest Ecosystem Management Assessment Team (FEMAT) (USDA et al., 1993) was strongly based on spotted owls and their habitat in addition to considerations of anadromous fish and marbled murrelets (*Brachyramphus marmoratus*). The FEMAT also completed expert opinion analysis that was specific to spotted owls and is cited in the 2008 Plan (Appendix C:74). That analysis showed that the 1992 Draft Final Recovery Plan had substantially lower likelihood of recovering owl populations than did Option 9 that was ultimately adopted as the NWFP. In addition, the Final Supplemental Environmental Impact Statement for the NWFP presented results of simulation analysis of population dynamics for spotted owls under various options that had been considered in that EIS (Raphael et al. 1994). These simulations suggested a much lower probability of stabilizing owl populations under alternative 7 (the 1992 Draft Final Recovery Plan) than under alternative 9 (the NWFP). In light of these analyses, and of the continuing decline in owl populations, there is no scientific rationale for the 2008 Plan that offers even less protection than the 1992 Draft Final Recovery Plan. In fact, the proposed strategy in the 2008 Plan seems to ignore the primary reason for the owl’s listing, which was loss of habitat.

Table 1. Potential change in acres conserved from current LRMPs

| State and Provinces  | Acres in LRMPs | Acres in MOCAs | Reduction in Area conserved |
|----------------------|----------------|----------------|-----------------------------|
| <b>Washington</b>    |                |                |                             |
| Westside Provinces   | 1,543,111      | 1,199,297      | -343,814 (-22%)             |
| Eastside Provinces   | 874,700        | 0              | -874,700 (-100%)            |
| Total                | 2,417,811      | 1,199,297      | -1,218,514 (-50%)           |
| <b>Oregon</b>        |                |                |                             |
| Westside Provinces   | 3,229,174      | 1,856,072      | -1,373,102 (-42%)           |
| Eastside Provinces   | 378,400        | 0              | -378,400 (-100%)            |
| Total                | 3,607,574      | 1,856,072      | -1,751,502 (-48%)           |
| <b>California</b>    |                |                |                             |
| Westside Provinces   | 1,288,684      | 898,460        | -390,224 (-30%)             |
| Eastside Provinces   | 235,200        | 0              | -235,200 (-100%)            |
| Total                | 1,523,884      | 898,460        | -625,424 (-41%)             |
| <b>3 State Total</b> |                |                |                             |
| Westside Provinces   | 6,060,969      | 3,953,829      | -2,107,140 (-35%)           |
| Eastside Provinces   | 1,488,300      | 0              | -1,488,300 (-100%)          |
| Total                | 7,549,269      | 3,953,829      | -3,595,440 (-48%)           |

Data for westside provinces were drawn from table C5 of the 2008 Plan. Data for eastside provinces were taken from the Final Supplemental Environmental Impact Statement for the NWFP, Table 3&4-38.

A particularly troublesome aspect of the reduction in the amount of habitat protected under the 2008 Plan is the elimination of some larger conservation areas. The MOCAs in the 2008 Plan are all designed to support 20 pairs of NSOs (except for the MOCA 2s which are by definition smaller). However, as noted in Appendix C of the 2008 Plan, Noon and McKelvey (1996:157) stated that areas with the capacity to support 30 to 40 pairs might be needed for stability and “in addition, a few large reserves (>100 pairs) significantly safeguard against population extinction. For these reasons, the original reserve design proposed by the Interagency Scientific Committee (ISC, Thomas et al 1990) represents a minimum system, with greater risks to persistence than initially envisioned.” The LSR system of the NWFP conformed to these recommendations of Noon and McKelvey. According to the Final Supplemental Environmental Impact Statement for the NWFP, 20 of the LSRs contained 20 to 29 known spotted owl activity centers, 9 contained 30 or more activity centers, 6 contained more than 50 activity centers, and the largest contained 216 activity centers (Chapters 3&4:231). These large areas that safeguard against population extinction would be eliminated under the 2008 Plan.

### **The 2008 Plan makes no provision for dispersal habitat.**

As in the 2007 Draft Plan, the 2008 Plan remains seriously deficient for its lack of a strategy for management of dispersal habitat. This is contrary to all previous plans that have been developed to maintain or increase populations of northern spotted owls, including the ISC strategy (Thomas et al. 1990), the 1992 Draft Final Recovery Plan and the 1994 NWFP. Both the ISC Plan and 1992 Draft Final Recovery Plan specified that federal lands between reserve areas (the “matrix”) should be managed such that at least 50% of the landscape would have trees with mean DBH  $\geq$  11 inches and canopy cover  $\geq$  40%. These guidelines were adopted because the biologists who developed the plans were concerned that dispersal among conservation areas would not be adequate to maintain populations within the reserves if suitable dispersal habitat was not present between conservation areas. The NWFP did not implement the 50-11-40 rule because the FEMAT determined that additional habitat protections in the NWFP (larger reserve areas, riparian reserves, Managed Late Successional Areas, Adaptive Management Areas, and retention of 15% cover in harvest units) would provide for adequate dispersal habitat. None of these additional features are included in the 2008 Plan, despite the fact that the MOCA’s are fewer, smaller, and further apart than in the ISC strategy and the 1992 Draft Final Recovery Plan.

Contrary to the failure of the 2008 Plan to consider dispersal habitat, biologists’ concerns about dispersal among and within conservation areas have increased in recent years as it has become apparent that young spotted owls must compete with increasing numbers of barred owls as they disperse. Yet there is no explanation in the 2008 Plan regarding the apparent lack of concern for the condition of dispersal habitat. If this lack of concern is based on the assumption that the NWFP will remain in effect, then there must be explicit and unambiguous statements that the 2008 Plan is predicated on the maintenance of the NWFP as a foundation.

### **Recovery action for management of older and structurally diverse forests is unclear and potentially ineffective.**

The recommendation in the 2008 Plan to stop logging “...substantially all older and more structurally complex multi-layered forests on Federal lands in the western Provinces” is encouraging. If the federal management agencies make a good faith effort to implement this recommendation it will greatly benefit spotted owls and their primary prey, and somewhat alleviate our concerns regarding the lack of any recommendations for protection of dispersal habitat in the plan. However, without strong interagency oversight regarding the definitions used to identify “older” and “more structurally complex multi-layered forest,” this recommendation will likely result in an endless series of confrontations regarding what gets protected from harvest and what does not. To leave this decision in the hands of local managers is to invite a return to the situation that led to the listing of the owl in the first place. Such local discretion will be subject to influences (e.g., pressure to increase timber harvest) which will lead to every timber sale being contested because it is in potential conflict with the imprecise recommendation in the 2008 Plan. This situation is likely to be most contentious in the Coast Ranges, where little old-growth forest remains, and where many forests consist of scattered old trees in a matrix of young trees. Most ecologists would classify these forests as structurally diverse and multi-layered, even in cases where the component of old trees is small. These old trees, and the stands of younger trees in which they are embedded, are valuable owl habitat (Thraillkill and Meslow 1990), and

are likely to be logged unless managers use a broad definition of structurally complex habitats and make a good faith effort to protect them. It is critical, therefore, that an interagency group and the scientific community reach consensus on what is meant by this recommendation before managers begin to design timber harvests in areas that will later be determined to be “structurally complex”.

**The 2008 Plan does not specifically protect all sites occupied by spotted owls.**

If the intent of the 2008 Plan is to stem the decline in spotted owl numbers, it makes no sense to recommend the protection of all structurally diverse forests without also protecting all sites currently or recently occupied by spotted owls on federal lands. It is illogical that the 2008 Plan protects presumptive owl habitat without an explicit link to protection of the owls themselves.

**The 2008 Plan addresses habitat modification due to fire and insects but does not provide adequate assessments, controls and oversight.**

The 2007 Draft Plan was heavily criticized for failing to deal with the potential for significant losses of spotted owl habitat to intense wildfire and insect epidemics on dry forest sites in eastern Washington and Oregon and in southwestern Oregon. The 2008 Plan addresses this issue by proposing to treat up to 2/3rds of the dry forests and 1/2 of moist forests in the eastern and California Cascades. The 2008 Plan proposes that these treatments would take place within the framework of a “landscape approach” (2008 Plan p. 14) without establishment or reference to any habitat reserves. It is unclear how this approach could be implemented in a manner consistent with the NWFP. Under the NWFP, thinning is allowed in LSRs but special attention must be paid to these areas before active management can proceed.

A shift toward a more active management program to restore eastern Cascade forest landscapes and reduce the potential for loss of owl habitat over large areas appears appropriate in light of recent large fires and insect epidemics and the potential that climate change will further increase such events. However, the active management program proposed for owl habitat on the eastern slopes of the Cascade Range is aggressive and unproven. The plan is not clear on the basis for treating 2/3rds of landscapes. It appears that the large treatment area is based on the assumption that owls avoid burned habitat, as well as the conclusion: “Historical abundance of late-successional forests plus old forests in fire prone areas ranged from about 5–40 percent (Hessburg *et al.* 1999, 2000).” (2008 Plan, page 21). The plan also does not quantify rates of high severity fire in describing the threat of such fire. Here, we address these issues and the assumption that active management and habitat reserves are incompatible.

**Evidence indicates spotted owl use of burned habitat is greater than anticipated.**

TWS (2007) criticized the 2007 Draft Plan for assuming all fires resulted in habitat loss. The 2008 Plan continues to describe, erroneously, that all fire causes habitat loss for spotted owls in dry provinces. TWS (2007) cited recent research indicating that fire does not always result in habitat loss for owls (Bond *et al.* 2006; Clark 2007). We briefly repeat that discussion here.

Two studies provide some relevant information. Clark (2007), working in the Klamath Province in Oregon, found that northern spotted owls continued to select stands that were lightly or moderately burned and used severely burned stands in proportion to their availability. In this study, spotted owls avoided areas that were salvage logged after the fire. In a study in the Sierra Nevada 4 years after a fire, Bond et al. (2006) found that California spotted owls preferentially used burned areas, including all burn severities, over unburned areas. Further, Bond et al. (2002) provided evidence that survival of spotted owls whose territories experienced a fire event was similar to owls inhabiting territories that did not experience fire events.

These studies indicate that spotted owls may use burned areas, perhaps even preferably after a few years of understory regrowth, and such areas do not become unsuitable as assumed in the 2008 Plan. The results therefore support the contention that spotted owls are resilient to fire, but that considerable research is still warranted to reduce uncertainty about the effects of fire on spotted owls. The temporal and spatial relationships of fire and post-fire legacy elements (snags, green trees, vegetation regeneration propagules) are among the many relationships that still need to be understood.

None of the above is intended to argue that severe wildfire in suitable owl habitat is a desirable occurrence but, rather, that such fire does not necessarily lead to habitat loss, and that we need more data on fire effects on owls. Hence, the 2008 Plan is not justified in suggesting that we know that fire always leads to complete habitat loss. A further, very serious consequence of the 2008 Plan assuming that post burn forests are non-functional as owl habitat is that this assumption can be used as justification for salvage logging of burned forest that is actually still functional as owl habitat.

### **Retention of habitat reserves is important in the management of eastern Oregon, Washington and California Cascades and Klamath Provinces forests.**

LSRs are a key component of the NWFP in the eastern Oregon, Washington and California Cascades and Klamath Provinces. The LSR designation needs to be retained even while an active management strategy is developed and implemented in these provinces. There are two important reasons for this. *First, the LSRs will provide the essential protection for suitable owl habitat in the moist forests found at higher elevations and on moister sites within these provinces.* This is an essential element of any overall plan for recovery of the spotted owl.

*Second, retaining the LSRs will help to insure that the dry forests located within these reserves will maintain the more focused attention directed by the NWFP.* As in the case of moist sites, the LSRs were delineated to incorporate some of the very best of the dry forest habitat. Hence these areas need to receive special attention in the overall planning for active management (thinning and burning) of the dry forest habitat. The NWFP does allow for active management of dry forests within the LSRs – even though this option has had limited application during the first 10 years of the plan – but the plan also sets ecological guidelines for such management. These guidelines need to remain in place in the planning and implementation of the large active management program.

**More comprehensive analysis of wildfire and insect threats to owl habitat in dry forest provinces is needed.**

The 2008 Plan’s assessment of fire threat appears to hinge on a reported fire rotation (time to burn an area equal to an area of interest, in this case old forest) of 69 years for severe fire in owl habitat within the Eastern Oregon Cascades from 1994-2003. This is attributed primarily to the 2003 B&B fire, but no data or sources are cited. The 2008 Plan also reports that 23 pairs of spotted owls were reduced to 6 by this fire, but again cites no source. From this analysis the 2008 Plan concludes that fire imperils spotted owls in the California Cascades and Eastern Washington Cascades in the same fashion as the Eastern Oregon Cascades. For the California Cascades, three pre-1994 fires were the only cited evidence.

It is not feasible in this critique of the 2008 Plan to do a comprehensive analysis of the extent to which wildfire and insect epidemics are modifying owl habitat in the dry forest provinces. However, as noted above, the 2008 Plan appears quite inadequate in this regard. For example, remote sensing and GIS data documented that 1,076 ha of high severity fire occurred in old forest in the B&B fire east of the Cascade crest (see Appendix A of this review for data and methods). The Eastern Oregon Cascade total for 1994-2003 was 2,306 ha. This is ~2.5% per decade, or a high-severity fire rotation of ~400 years (10/0.025), not 69 years. For the California Cascades, the two main fires named as evidence of habitat loss were actually outside the province. The third burned ~6,000 ha of the ~1,000,000-ha province in 1977; severity data are lacking. However, the decadal rate (1994-2003) of high-severity fire in old forests was only 0.16%, a high-severity rotation of ~6250 years (10/0.0016), and 3.2% in the Eastern Washington Cascades, a high-severity rotation of ~313 years. Even expansively defining forest loss (Appendix A), and focusing on a short period of high fire activity, losses of old forests to fire in dry provinces were far less than rates of old forest recruitment (Table 2). If stand-replacing fire were defined as 80 percent or more basal area mortality, high severity fire rotations would be considerably longer than those reported in Table 2 (Appendix A).

Table 2. Recent high-severity fire versus growth rates in old forest within dry provinces. See Mouer et al. (2005) for growth rates.

|                             | Decadal rate of loss (%) to high-severity fire in old forest | Fire rotation for high-severity fire in old forest (years) | Ratio of old-forest growth rate to high-severity loss rate in old forest |
|-----------------------------|--|--|--|
| Oregon Eastern Cascades     | 2.5  | 400  | 4.4  |
| Washington Eastern Cascades | 3.2  | 313  | 3.4  |
| California Cascades         | 0.16   | 6250   | 68.8   |

Even with these rates of burning, extensive modification of suitable owl habitat has occurred in recent decades, not only by high-intensity wildfire, but also extensive lethal outbreaks of insects, primarily spruce budworm. Significant areas have been affected within the range of the northern spotted owl in the Deschutes, Gifford Pinchot, Wenatchee, and Okanogan National Forests, the

Yakama Indian Reservation, and associated state trust and private lands. Although analyses have been done on disturbance-induced habitat change (e.g. Mouer et al. 2004), and forest insect impacts are monitored, our understanding of forest disturbances in dry forest types, and their effects on spotted owls, needs to be considerably improved.

The above analysis indicates that high-severity fire in old forests within dry provinces may be lower than estimated by FWS. From the standpoint of fire risk the notion that there is not time for careful experiments, research, and monitoring to resolve uncertainty has not been demonstrated (Table 2). High priority should be given to a thorough scientific review of the disturbance dynamics of the dry forests within the range of the northern spotted owl and analysis of the probable consequences of climate change on this habitat. A scientifically sound assessment of future habitat trajectories needs to be combined with better understanding of the effects on spotted owls of both natural disturbances and human activities aimed at mitigating them. This would provide a sound scientific basis to help guide the active management program.

### **Summary of concerns about proposed treatment of eastside forests.**

Treatments of habitat to address issues of fire and insects need to be carefully planned and implemented using a broadly representative scientific oversight group and designed within the framework of a credible, adaptive management strategy, including a significant investment in monitoring and research. Because little is understood about spotted owl (or barred owl) response to the various restoration treatments that may be proposed, an aggressive program of monitoring and research is essential. Treatment effects on both owl species must be understood. For example, treatments may be neutral or positive for spotted owls and their prey but could displace barred owls from their preferred habitat. Such displacement would likely increase the competitive pressure of barred owls on spotted owls. Consequently, the potential effects on barred owls need to be considered as well as those on spotted owls. Furthermore, the 2008 Plan does not specify the time frame over which treatments would be accomplished. The impression is that the treatments would encompass a very large portion of the landscape in such a short time period that monitoring and research would not be available quickly enough for effective adaptive management.

Planning and implementation must be done as a coordinated and comprehensive strategy; individual management units absolutely must not be allowed to develop their own independent interpretations of the management direction but, rather, should work with the oversight group to adapt the overall strategy to their particular owl, forest, and landscape environment.

While there is broad agreement that forest conditions in fire prone provinces require attention, the 2008 Plan goes too far by avoiding the designation of habitat reserves and proposing extensive treatments with little oversight within the territories of a threatened species. Spotted owls are considered sensitive to silvicultural activities and there are to date no published articles on their response to thinning. Retention of LSRs as habitat reserves and a more measured approach to treatment are central to spotted owl recovery. As noted, the retention of reserves does not preclude treatments intended to improve owl habitat, reduce fuels, and restore natural processes. However, the retention of reserves will help insure that activities are coordinated across jurisdictions; based on careful analysis and the most current knowledge; designed and

monitored to provide needed new information; appropriate for all resource values; and properly implemented. Without these safeguards in place the activities proposed in the 2008 Plan could easily become a massive thinning operation with potentially disastrous effects on owl recovery.

### **Guidelines for salvage after fires are lacking.**

Recovery Action 22 regarding salvage in the 2007 Draft Plan has been deleted from the 2008 Plan; the only mention of salvage after wildfires is included in Appendix E, Habitat Restoration and Salvage, which was copied from the SEI report (Courtney et al. 2008). This appendix to the 2008 Plan attempts to relate salvage to habitat restoration in order to provide some guidelines for salvage. Unfortunately, it fails to make this connection. Hence, the only guideline to emerge from the 2008 Plan is the statement that “the salient issue regarding salvage is whether it will enhance Spotted Owl conservation.” Such an ambiguous statement does not provide sufficient guidance for management agencies to determine an appropriate approach for salvage of dead trees after wildfire or other natural events that cause tree mortality. Guidelines for salvage were included in the 1992 Draft Final Recovery Plan and the NWFP, but these guidelines were ignored in the 2008 Plan. The 2008 Plan is deficient with respect to wildfire and salvage because it lacks specific guidelines for salvage logging and because burned habitat may be important to spotted owls. Forests affected by fire should be managed like other habitat that is important to spotted owls.

### **Recommendations for contributions of nonfederal lands are inadequate.**

The 2008 Plan was prepared with the understanding that federal lands would play the primary role in achieving recovery of the spotted owl, and this is entirely appropriate. However, there are many areas throughout the owl’s range where the amount or distributions of federal lands are inadequate to achieve recovery, so nonfederal lands must contribute to recovery. The Conservation Support Areas (CSAs) in the 2008 Plan were designed to accomplish this task, and FWS is to be commended for including these areas in the plan. Unfortunately, the number of these areas and the management guidelines for them are likely inadequate to accomplish this task, and there has not been any improvement in the system of CSAs from the 2007 Draft Plan to the 2008 Plan despite criticism of the CSAs in the 2007 Draft Plan. Furthermore, there are numerous potential “loopholes” that likely will prevent the implementation of appropriate management that is needed immediately. This criticism is particularly appropriate for the state of Oregon where only 5 CSAs are designated and 3 of them consist of the Adaptive Management Areas from the Northwest Forest Plan that should have been included in the network of MOCAs. The other 2 CSAs in Oregon are not mapped. Dispersal habitat is the sole purpose for these latter two CSAs and the guidelines are not mandatory. Consequently, we conclude that the CSAs in Oregon will provide little contribution toward the conservation of spotted owls.

The 1992 Draft Final Recovery Plan identified areas of special interest where recommendations for nonfederal lands were specified to provide habitat for nesting owls and dispersal habitat. The purpose of these areas was the same as those for the CSAs in the 2008 Plan but the 2008 Plan specifies many fewer areas, and the guidelines for these areas are vague or completely lacking. This is especially of concern considering the declining spotted owl populations (Anthony et al. 2006) and presumed threats from barred owls (Buchanan et al. 2007). The status and trends of

owl populations are much more precarious now (Anthony et al. 2006) than they were in the early 1990s (Forsman et al. 1996). The 1992 Draft Final Recovery Plan identified supplemental pair areas, habitat for clusters of nesting owls outside of conservation areas, and guidelines for protective management in the areas of special management significance on nonfederal lands. The 2008 Plan is basically silent on these topics, leading to the inescapable conclusion that there will be less habitat for nesting pairs, weaker guidelines for management, and much lower contribution to recovery from nonfederal lands. For example, the Elliott, Tillamook, and Clatsop State Forests in the Coast Ranges of Oregon were identified in the 1992 Draft Final Recovery Plan as state-owned lands that should contribute habitat for nesting owls; however, these lands are neither mapped nor discussed in the 2008 Plan. In fact, the acreage of the CSAs in Oregon (63,058 acres) is markedly less compared to that of Washington (2,163,453 acres) or California (1,019,523 acres). In addition, the amount of acreage in Oregon CSAs declined from 575,385 to 63,058 acres from the 2007 Draft Plan to the 2008 Plan, and they are comprised mainly of federal lands (see page 91, 2008 Plan), not state or private lands. In addition, the function of these lands in Oregon is mostly to provide dispersal habitat that is a much lower standard or requirement than provision of nesting habitat. Consequently, the extent and function of the CSAs in Oregon are totally inadequate. These recommendations should be completely revised. Contributions to owl recovery by the state of Oregon should be commensurate with contributions by the states of Washington and California. The current system of CSAs suggests the state of Oregon is not contributing in a meaningful way to the recovery of northern spotted owls.

Equally important, all of the guidelines for management of the CSAs are vague and appear to be voluntary (see pages 9 and 14, 2008 Plan), which is a prescription for decline in habitat and populations of spotted owls. Such ambiguity likely will lead to the criterion “failure of regulatory mechanisms” under the Endangered Species Act. The guidelines for the CSAs should be mandatory until populations of spotted owls are fully recovered. The number, amount of acreage, and management guidelines for the CSAs under the 2008 Plan should equal or exceed that recommended in the 1992 Draft Final Recovery Plan for all 3 states because of the more precarious situation of owls today (Anthony et al. 2006, Gutiérrez et al. 2007). This section of the 2008 Plan needs to be revised and upgraded considerably for all 3 states to improve their contributions to conservation of the spotted owl.

### **Measures proposed to manage the threat posed by barred owls are improved from the 2007 Draft Recovery Plan.**

Barred owls present a potentially significant threat to spotted owls. The 2008 Plan focuses on experiments to remove and control barred owls in specific areas as a way to determine the extent to which they compete with spotted owls. This is appropriate at this time before any landscape level controls are considered. The consideration of barred owls in the 2008 Plan is much improved over the actions proposed in the 2007 Draft Plan.

### **Formation of work groups.**

Formation of work groups to deal with issues concerning spotted owls, barred owls, and dry-forest landscapes is a good idea. However, the guidelines in the 2008 Plan are so vague (non-existent in some cases) that the work groups will be essentially autonomous which is a recipe for

conflicts. This could be a significant problem depending on the makeup of the work groups and the direction and authority they are given. The 2008 Plan should provide specific guidance for these work groups in addition to their composition, and specific direction for their formation and operations should be articulated. There is enough uncertainty in the 2008 Plan regarding the formation, operation and authority of work groups that there is no assurance that the appropriate management strategies will be designed and available for implementation.

## **SUMMARY**

It is clear that the Fish and Wildlife Service responded constructively to some of the comments and suggestions submitted in response to the 2007 Draft Plan. Major positive improvements in the 2008 Plan are: 1) the elimination of goals for target percentages of suitable habitat; 2) the “de-emphasis” of barred owls as the singular threat to spotted owls and elimination of plans to immediately apply control measures; and 3) a commitment to continuation of demographic studies. The proposal to retain all older and structurally diverse forest is also a positive step but may be subject to tremendous variation in application.

Unfortunately the underlying strategy for recovery of northern spotted owls has not improved over that provided in the 2007 Draft Plan, and some components of it have actually been weakened. The 2008 Plan proposes to reduce the amount of habitat protected for owls in westside provinces; eliminate habitat reserves entirely in eastside provinces in favor of a risky “floating habitat” scheme accompanied by massive forest treatments; ignore any consideration of dispersal habitat; and allow salvage logging without adequate guidelines. Compared to the LSRs and AMAs of the NWFP, the proposed MOCAs would reduce protected acres by a stunning 56%.

As has been noted numerous times, northern spotted owl populations continue to decline across their range (Anthony et al. 2006). The NWFP appears to have been effective in slowing this decline. This fact argues strongly that the recovery plan for northern spotted owls should be based on the NWFP and further strengthen the provisions of that plan. Instead the 2008 Plan proposes to weaken nearly every key provision of the NWFP. There is simply no scientific justification for this plan, and in fact the plan’s authors offer none.

We believe that the 2008 Plan will not achieve recovery of northern spotted owls and will likely exacerbate their precarious status. We urge the Fish and Wildlife Service to withdraw this plan before it is used as justification for the land management agencies to weaken provisions of the NWFP and to engage in activities that threaten northern spotted owls and their habitat. Implementation of this plan would represent a significant step backward in conservation of the northern spotted owl and of other species that share parts of its range. We believe this plan could aid in the dismantling of the NWFP, raising the specter of additional listings and species-by-species conservation efforts which is precisely the “nightmare” scenario that the NWFP was intended to avoid. Using a poorly crafted recovery plan for northern spotted owls to bring about this scenario would place the credibility of species recovery by the Fish and Wildlife Service in jeopardy.

## Literature Cited

- Anthony, R.G., E.D. Forsman, A.B. Franklin, D.R. Anderson, K.P. Burnham, G.C. White, C.J. Schwarz, J. Nichols, J.E. Hines, G.S. Olson, S.H. Ackers, S.L. Andrews, B.L. Biswell, P.C. Carlson, L.V. Diller, K.M. Dugger, K.E. Fehring, T.L. Fleming, R.P. Gerhardt, S.A. Gremel, R.J. Gutiérrez, P.J. Happe, D.R. Herter, J.M. Higley, R.B. Horn, L.L. Irwin, P.J. Loschl, J.A. Reid, and S.G. Sovern. 2006. Status and trends in demography of northern spotted owls, 1985-2003. *Wildlife Monographs* No. 163:1-47.
- Bond, M.L., R.J. Gutiérrez, A.B. Franklin, W.S. LaHaye, C.A. May, and M.E. Seamans. 2002. Short-term effects of wildfires on spotted owl survival, site fidelity, mate fidelity, and reproductive success. *Wildlife Society Bulletin* 30:1022-1028.
- Bond, M.L., D.E. Lee, and R. Siegel. 2006. Use of post-fire landscapes by California spotted owls in the Sierra Nevada. Poster. 3<sup>rd</sup> International Congress on Fire Ecology, San Diego, CA, USA.
- Buchanan, J.B., R.J. Gutiérrez, R.G. Anthony, T. Cullinan, L.V. Diller, E.D. Forsman, and A.B. Franklin. 2007. A synopsis of suggested approaches to address potential competitive interactions between barred owls (*Strix varia*) and spotted owls (*Strix occidentalis*). *Biological Invasions* 9:679-691.
- Courtney, S.P., J.A. Blakesley, R.E. Bigley, M. Cody, J.P. Dumbacher, R.C. Fleischer, A.B. Franklin, J.F. Franklin, R.J. Gutiérrez, J.M. Marzluff, and L. Sztukowski. 2004. Scientific evaluation of the status of the northern spotted owl. Sustainable Ecosystems Institute, Portland, Oregon.
- Courtney, S.P., A.B. Carey, M. Cody, K. Engle, K.E. Fehring, J.F. Franklin, M.R. Fuller, R.J. Gutiérrez, J.F. Lehmkuhl, M.A. Hemstrom, P.F. Hessburg, S.L. Stephens, L.A. Sztukowski, L. Young. 2008. Scientific review of the draft northern spotted owl recovery plan and reviewer comments. Sustainable Ecosystems Institute (SEI), Portland, Oregon.
- Clark, D.A. 2007. Demographic characteristics, home ranges and habitat selection of northern spotted owls in burned landscape of southwest Oregon. MS Thesis, Oregon State University, Corvallis, OR, USA (In preparation).
- Forsman, E.D., S. DeStefano, M.G. Raphael, and R. J. Gutiérrez (eds.). 1996. Demography of the northern spotted owl. *Studies in Avian Biology* No. 17.
- Gutiérrez, R. J., M. Cody, S. Courtney, and A. B. Franklin. 2007. The invasion of Barred Owls and its potential effect on the Spotted Owl: a conservation conundrum. *Biological Invasions* 9:181-196.
- Hessburg, P.F., B.G. Smith, S.D. Kreiter, C.A. Miller, R.B. Salter, C.H. McNicoll, and W.J. Hann. 1999. Historical and Current Forest and Range Landscapes in the Interior Columbia River Basin and Portions of the Klamath and Great Basins, Part

I: Linking Vegetation Patterns and Landscape Vulnerability to Potential Insect and Pathogen Disturbances. General Technical Report PNW-GTR-458, USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon.

Hessburg, P.F., B.G. Smith, R.B. Salter, R.D. Ottmar, and E. Alvarado. 2000. Recent changes (1930s–1990s) in spatial patterns of interior northwest forests, USA. *Forest Ecology and Management* 136:53–83.

Löhmus, A. 2004. Raptor habitat studies – the state of the art. Pages 279-296 in Chancellor, R.D., and B.U. Meyburg (editors). *Raptors Worldwide*. World Working Group on Birds of Prey and Owls, Budapest, Hungary.

Moer, M., T.A. Spies, M. Hemstrom, J.R. Martin, J. Alegria, J. Browning, J. Cissel, W.B. Cohen, T.E. Demeo, S. Healey, and R. Warbington. 2005. Northwest Forest Plan—the first 10 years (1994–2003): status and trend of late-successional and old-growth forest. Gen. Tech. Rep. PNW-GTR-646. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, Oregon

Noon, B.R., and K.S. McKelvey. 1996. Management of the spotted owl: a case history in conservation biology. *Annual Review of Ecology and Systematics* 27:135-162.

Raphael, M.G., J. Young, K.S. McKelvey, B.M. Galleher, and K. Peeler. 1994. A simulation analysis of population dynamics of the northern spotted owl in relation to forest management alternatives. Pages 1-16 Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. USDA Forest Service, USDI Bureau of Land Management, Portland, Oregon.

Thomas, J.W., E.D. Forsman, J.B. Lint, E.C. Meslow, B.R. Noon, and J. Verner. 1990. A conservation strategy for the northern spotted owl. Interagency Scientific Committee to Address the Conservation of the Northern Spotted Owl. USDA Forest Service, USDI Bureau of Land Management, USDI Fish and Wildlife Service, and USDI National Park Service. Portland, Oregon. 458 pp.

Thraillkill, J. A., and E. C. Meslow. 1990. Home range size and habitat utilization of northern spotted owls in the Wolf Creek Study Area, Eugene BLM District, Oregon. Final Report. Oregon Cooperative Wildlife Research Unit, Oregon State University, Corvallis, OR. 78pp  
USDA (U.S. Department of Agriculture) U.S. Department of the Interior, U.S. Department of Commerce, and U.S. Environmental Protection Agency. 1993. Forest ecosystem management: an ecological, economic and social assessment (FEMAT). Report of the Forest Ecosystem Management Assessment Team. U.S. Forest Service, Portland, Oregon.

USDA (U.S. Department of Agriculture), and USDI (U.S. Department of the Interior). 1994a. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the northern spotted owl; standards and guidelines for management of habitat for late-successional and old-growth forest related species within the

range of the northern spotted owl (NWFP). USDA Forest Service, Portland Oregon, and USDI Bureau of Land Management, Portland, Oregon.

USDA (U.S. Department of Agriculture), and USDI (U.S. Department of the Interior). 1994b. Final supplemental environmental impact statement on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl (NWFP). USDA Forest Service, Portland, Oregon, and USDI Bureau of Land Management, Portland, Oregon. USDA

USDI Bureau of Land Management. 2007. Draft Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management Districts. USDI Bureau of Land Management, Portland, Oregon.

USFWS (U. S. Fish & Wildlife Service). 1992. Draft final recovery plan for the northern spotted owl. USDI Fish and Wildlife Service, Portland, Oregon.

USFWS (U. S. Fish & Wildlife Service). 2007. 2007 Draft recovery plan for the northern spotted owl, *Strix occidentalis caurina*: Merged options 1 and 2. Portland, Oregon. 170pp.

USFWS (U.S. Fish & Wildlife Service). 2008. Final recovery plan for the northern spotted owl, *Strix occidentalis caurina*. U.S. Fish and Wildlife Service, Portland, Oregon. xii + 142 pp.

## Appendix A

Fire-severity data from 1994-2002 (Oregon Eastern Cascades), 1994 and 1996-2002 (Washington Eastern Cascades), and 1994-2003 (California Cascades) were from Mouer et al. (2005). They defined high-severity fire as 71-100% canopy mortality. Data were collected in 1-year change cycles, such that the period 1996-2002, for example, would represent seven cycles (years). There were 7, 8, and 9 cycles (years) of high-severity fire data from in WA, OR, and CA, respectively. The data were converted into decadal rates for ease of comparison (Table 1).

Appendix A Table 1. Recent high-severity fire versus growth rates in old forest within dry provinces. See Mouer et al.(2005) for growth rates.

|                             | Decadal rate of loss (%) to high-severity fire in old forest | Fire rotation for high-severity fire in old forest (years) | Ratio of old-forest growth rate to high-severity loss rate in old forest |
|-----------------------------|--|--|--|
| Oregon Eastern Cascades     | 2.5  | 400  | 4.4  |
| Washington Eastern Cascades | 3.2  | 313  | 3.4  |
| California Cascades         | 0.16   | 6250   | 68.8   |

Data on fire severity and northern spotted owl occupancy prior to and after the 2003 B&B fire were from USFS (2004a). In the B&B fire, the differenced Normalized Burn Ratio (dNBR) was used to map high-severity areas, defined as 75-100% canopy mortality. For the 2003 Davis fire in the Oregon Eastern Cascades, the “fire intensity” map used was from (USFS 2004b) and was based upon satellite imagery. In high-intensity areas, trees with up to 30% remaining live crown were defined as “dead.” All high-intensity areas were assumed to represent high fire *severity*. All these methods tend to produce an estimate of high-severity that may include surviving overstory trees, particularly since mature western U.S. conifers have survival rates of ~50-70% for trees with only ~25-30% remaining live crown (Ryan and Reinhardt 1988). Percent survival expressed as basal area or live tree volume instead of number of trees would be higher given that larger trees survive higher levels of crown loss than smaller trees, which tend to be much more numerous (Ryan and Reinhardt 1988). Stand-replacing fire, expressed as basal area, has been defined as 20 percent or lower survival (Chapell and Agee 1994, Larson and Franklin 2004). Methods discussed above may permit areas with two or three times this level of survival to be classified as stand-replacing.

Using GIS, 2003 high severity and pre-1994 fire perimeters were overlaid on province boundaries. The portion of B&B outside of Oregon Eastern Cascades was excluded. The classification of old forest in Mouer et al. (2005), available online as a GIS coverage, was used to calculate all spotted owl potential habitat burned at high severity in the Oregon Eastern Cascades in the 2003 B&B and Davis fires. The area of high-severity fire in old forests in 1994-2002 from Mouer et al. (2005) was added to calculate the percent burned and high-severity fire rotation from 1994-2003 in the Oregon Eastern Cascades. A more complete assessment of fire effects would include the years since 2003. Because there have not been any major fires, like B&B or

Davis, since 2003 in the Oregon Eastern Cascades, the rotation for high-severity fire would be longer than 400 years if more recent data were included, but those fire-severity data were not readily available.

## **Appendix A Literature Cited**

Chappell, C.B. and J.K. Agee . 2006. Fire severity and tree seedling establishment in *Abies magnifica* forests, southern Cascades, Oregon. *Ecological Applications* 6: 628-640.

Larson, A.J. and J.F. Franklin . 2005. Patterns of conifer tree regeneration following an autumn wildfire event in the western Oregon Cascade Range, USA. *Forest Ecology Management* 218: 25-36.

Moeur, M., T.A. Spies, M. Hemstrom, J.R. Martin, J. Alegria, J. Browning, J. Cissel, W.B. Cohen, T.E. Demeo, S. Healey, and R. Warbington. 2005. Northwest Forest Plan—the first 10 years (1994–2003): status and trend of late-successional and old-growth forest. Gen. Tech. Rep. PNW-GTR-646. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, Oregon.

Ryan, K.C. and E.D. Reinhardt. 1988. Predicting postfire mortality of seven western conifers. *Canadian Journal of Forest Research*. 18: 1291-1297.

USFS. 2004a. *Final Environmental Impact Statement, B&B Fire Recovery Project* (Sisters Ranger District, Deschutes National Forest, June 2005; <http://www.fs.fed.us/r6/centraloregon/projects/units/sisters/b-b-fire/bb-final-eis.shtml>).

USFS. 2004b. *Final Environmental Impact Statement, Davis Fire Recovery Project* (Crescent Ranger District, Deschutes National Forest, August 2004; <http://www.fs.fed.us/r6/centraloregon/projects/units/crescent/davisfire/davis-feis.shtml>).