SUMMARY OF PEER REVIEW OF DRAFT NORTHERN SPOTTED OWL RECOVERY PLAN

Executive Summary – the northern spotted owl was listed as federally threatened in 1990 due to destruction and adverse modification of its primary habitat, old-growth forests, and inadequacy of regulatory mechanisms that placed the owl at risk of extinction. While a draft recovery plan for the owl was finalized in 1992, it was never approved by Fish & Wildlife Service (FWS). A separate and approved critical habitat determination for the owl in 1992 placed restrictions on logging and development about 6.9 million acres of older forests on federal lands. In addition, for more than a decade, the Northwest Forest Plan (NWFP) served as the major federal contribution to restoring owl viability on federal lands. The NWFP set aside about 7 million acres of forests (4.5 million acres of which were old-growth) in late-successional reserves (LSRs) and included other habitat protections and restorative actions for the owl and other old-growth associated species. In 2004, FWS conducted a five-year status review of the owl confirming the importance of the NWFP in stemming the owls' decline and additional reviews have demonstrated its many ecosystem benefits[1]*. In April 2006, FWS appointed a multi-stakeholder recovery team consisting of federal and state land managers, timber, and conservation representatives to develop a recovery plan for the owl. A draft recovery plan (April 2007) and related critical habitat determination (May 2007) was recently proposed by FWS for the owl. This summary document focuses on the draft spotted owl recovery plan published in the Federal Register on April 26, 2007. The draft spotted owl recovery plan includes two options. Option 1 builds, in part, on most of the LSRs initially established in the NWFP and refers to them as Managed Owl Conservation Areas (MOCAs), although there are reductions in habitat proposed under this option compared to the NWFP. Option 2 does not include fixed reserves, but rather turns over the selection of large blocks of habitat for the owl to local BLM and Forest Service managers and includes additional reductions in habitat protections compared to the NWFP. While recovery plans are largely guidance documents, they are used in Section 7 consultations, particularly during agency forest plan revisions. Additionally, this recovery plan is integral to 1.5 million acres in critical habitat exemptions also proposed by FWS. Recovery plans are required by the Endangered Species Act (ESA) to be based on the best available science in order to ensure federal land management actions contribute to the recovery of listed species. To ensure that the draft owl recovery plan was indeed based on the best available science, FWS commissioned two independent reviews by scientists and professional societies: a joint, independent peer review conducted by the Society for Conservation Biology (www.conbio.org) and American Ornithologists' Union*

[1]Courtney, S.P., J.A. Blakesley, R.E. Bigley, M.L. Cody, J.P. Dumbacher, R.L. Fleischer, A.B. Franklin, J.F., R.J. Gutierrez, J.M. Marzluff, and L. Sztukowski (eds). 2004. Scientific evaluation of the status of the Northern Spotted Owl. Sustainable Ecosystems Institute, Portland, OR. DellaSala, D. A., and J. Williams. 2006. Northwest Forest Plan Ten Years Later – how far have we come and where are we going? Conservation Biology 20:274-276. Thomas, J.W., J.F. Franklin, J. Gordon, and K.N. Johnson. 2006. The Northwest Forest Plan: origins, components, implementation, experience, and suggestions for change. Conservation Biology 20:277-286. Lint, J. 2005. Status and trends of Northern Spotted Owls populations and habitat. USDA PNW-GTR-648.

(www.aou.org) as summarized here and a separate review conducted on the habitat provisions by recognized owl scientists, which was not available at the time of this writing. For the SCB-AOU peer review, the societies used a "blind" peer review process where the reviewers were chosen from the societies based on their particular qualifications. A third peer review was conducted independently by The Wildlife Society (www.wildlife.org) and is summarized here. The Wildlife Society solicited reviews from recognized experts within the society who chose to remain anonymous. The independent peer reviews from each of the societies reached similar conclusions regarding numerous scientific flaws in the draft spotted owl recovery plan. In sum, there appears to be a scientific consensus that the recovery plan will not only fail to recover the owl but could result in the future need to uplist the species to endangered. This is largely because the recovery plan would reduce by more than a third the habitat acreage currently protected by the NWFP at a time when the owl is in steep decline primarily from ongoing habitat loss and presumed competition from the barred owl. In particular, The Wildlife Society recommended convening an independent panel of scientists to redo the owl recovery plan to ensure it is based on the best available science necessary to recover the species.

SUMMARY OF PEER REVIEW CONDUCTED BY THE WILDLIFE SOCIETY

"The Wildlife Society (TWS), founded in 1937, is an international non-profit scientific and educational association dedicated to excellence in wildlife stewardship through science and education. Our mission is to enhance the ability of wildlife professionals to conserve diversity, sustain productivity, and ensure responsible use of wildlife resources for the benefit of society. The Wildlife Society encourages professional growth through certification, peer-review Publications, Conferences, and working groups."

For this peer review, TWS solicited input from experts in population dynamics, spotted owl ecology, forest ecology and management, and fire ecology, including scientists who have participated in spotted owl research, planning and recovery for the past thirty years. Here are their main findings:

The 2007 Draft Recovery Plan (2007 Plan) does not adequately avail itself of the depth and breath of this information, resulting in a seriously flawed plan for recovery.....neither option presented in the 2007 Plan will lead to recovery of this species.

Because this draft plan falls so far short of the measures that are needed to recover spotted owls, it should not be used as a basis for a final version of the recovery plan. Instead, the Fish and Wildlife Service should start over with a fundamental commitment to using the best available science and finding real solutions to threats faced by spotted owls. In doing so, the Fish and Wildlife Service should reconstitute the membership of the recovery team so that it emphasizes biologists and ecologists with extensive expertise in the biology of the spotted owl and the ecology and management of Pacific Northwest forests.

KEY FINDINGS MADE BY TWS REVIEWERS

- … 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 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.
- 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.
- …it is perplexing to find a proposed recovery plan that presents 2 options, both of which propose a reduction in suitable habitat available to the owl, a habitat specialist. In addition, these options apparently replace the general concern for habitat conditions with an increased attention to presumed competition between barred owls (*Strix varia*) and spotted owls.
- The 2007 Plan provides no justification for reducing conservation measures for northern spotted owls at a time when owl populations continue to decline.
- The changes proposed in the 2007 Plan also would constitute a failure to adequately address a key reason for listing the owl: "failure of existing regulatory mechanisms.
- ….the 2007 Plan's analyses and assumptions are based on flawed assumptions, improper statistical methods, and selective use of the published literature.
- For each federal forest management unit to devise and implement its own response to emerging challenges is a recipe for a chaotic approach to spotted owl recovery, and a subsequent "failure of existing regulatory mechanisms."
- …….neither option in the 2007 Plan considers the impact of the proposed actions on other old forest associated species. This lack of an "ecosystem approach" invites species by species-management actions, which is a highly inefficient and potentially problematic conservation strategy.
- The 2007 Plan precludes objective evaluation because there is rarely a clear presentation of either the scientific basis for the plan or novel analysis/data to support its framework/recommendations.

- Declines in the state of Washington are so significant that populations in the state might justifiably be considered endangered rather than threatened.
- In short, either option presented in this recovery plan, if accepted and implemented, would represent a significant step backward for a species that is clearly still in trouble.
- We are drawn to the conclusion that Options 1 and 2 will not achieve the basic interest of spotted owl conservation. We come to this conclusion because the spotted owl is one of the most studied species ever listed under the ESA, yet there is no reliance in this plan on the breadth and depth of the information available to create a scientifically credible plan or to even address reasons why the owl was listed in the first place (i.e. declining populations and failure of existing regulator mechanisms).

Additional flaws noted by TWS are listed in Appendix A of this summary.

SUMMARY OF PEER REVIEW CONDUCTED BY SOCIETY FOR CONSERVATION BIOLOGY AND AMERICAN ORNITHOLOGISTS' UNION

"The Society for Conservation Biology (SCB) is an international professional organization dedicated to promoting the scientific study of the phenomena that affect the maintenance, loss, and restoration of biological diversity. The Society's membership comprises a wide range of people interested in the conservation and study of biological diversity: resource managers, educators, government and private conservation workers, and students make up the more than 10,000 members world-wide. SCB's mission is to advance the science and practice of conserving the Earth's biological diversity."

"Founded in 1883, the American Ornithologists' Union is the oldest and largest organization in the New World devoted to the scientific study of birds. Although the AOU primarily is a professional organization, its membership of about 4,000 includes many amateurs dedicated to the advancement of ornithological science."

For this peer review, SCB-AOU selected four scientists with backgrounds in population ecology, forest management, and wildlife conservation. The peer review was sent to FWS without stitching together the main findings among reviewers, which is provided here in this summary.

The Draft Recovery Plan is unacceptable because:

- *In Options 1 and 2, habitat protections for the owl are lessened from current NWFP protections at a time when they should be strengthened.*
- *The Recovery Team failed to make use of the best available science and, in fact, appears to have selectivity cited from the available science to justify a reduction in habitat protection.*

- *The Recovery Team was apparently unaware of the combined habitat-demography modeling that was done to evaluate various alternatives under the NWFP. As a result, they put too much emphasis on an outdated model.*
- *Based on current information, far too much emphasis is placed on the adverse effects of barred owl range expansion.*
- *The administrative complexity associated with the implementation of Option 2 renders it unworkable.*

KEY FINDINGS MADE BY SCB-AOU

- Given the findings of the recent USFWS-sponsored status review (USFWS 2004, Courtney et al. 2004), the results of demographic analyses (Anthony et al. 2006), and the expansion of the barred owl, it seems that the only responsible response to achieve recovery of the Northern spotted owl is to maintain, or strengthen, current conservation actions. Since the primary action to date has been the setting aside of late seral forest into a reserve system, it is logical to maintain, and perhaps increase in size, the dedicated reserve areas.
- In contrast to "best available scientific information" and the results of the NWFP monitoring program (Lint 2005), the Draft Recovery Plan for the Northern Spotted Owl (2007) proposes two options, both of which reduce the amount of habitat set aside in reserves to benefit the spotted owl.
- …..the proposed Plan appears to have ignored, or misunderstood, the most recent scientific findings.
- The proposed options are not supported by any reasonable interpretation of the best available scientific information.
- While the writing is generally clear, the topical coverage reasonably comprehensive, and the tone of many sections of the draft plan reasonable, I found that where this plan diverges substantively from previous conservation plans some of these changes are likely to result in reduced conservation efforts for owls and their habitat. For a species where continued evidence of population declines is so strong (and based on what is arguably the best demographic data set ever collected for a wild animal), these changes give me concern.
- …despite real reductions in logging on federal lands, there is strong evidence that demography of northern spotted owls across their range remains insufficient to maintain stable populations. Further, owl habitat is continuing to decline at the rate of 2.1% per year on federal lands (Table 2.1, page 128). In light of these trends, I would argue that conservation efforts should be strengthened not weakened.
- Northern spotted owls are at risk because old growth forests have been logged and are largely gone, therefore any strategy to recover owls has to focus on conservation and recovery of these old growth forests. To me, that means that the amount of old growth forest must be increased either by conserving existing old growth (unlikely) or managing younger forests so that develop quickly into old forests (more likely). I suspect that if the amount of old growth forest were increased throughout the range of the owl, the risk of owls going extinct would very likely be reduced appreciably.

- … the role of early- and mid-seral stage forests in spotted owl habitat was overstated throughout the document.
- In my view, the primary issue threatening the continued persistence of the owl remains the original loss of habitat through logging that prompted the original listing.
- ….in many key details this plan appears significantly weakened from previous ones, in particular in its lessened emphasis on late-seral forest, and the broad discretion it allows forest managers to conduct such activities as salvage logging within conserved owl areas.

[**note – all 3 society reviews were especially critical of the lack of sufficient protections in owl reserves from post-fire (salvage) logging**].

APPENDIX A:
ADDITIONAL SCIENTIFIC FLAWS NOTED BY PEER REVIEWERS

TWS PEER REVIEW

SCIENTIFIC FLAWS IN OPTION 1

"*Option 1 reduces protection of habitat and known owl locations, makes no provision for owl dispersal habitat, proposes potentially ineffective barred owl controls, proposes new targets for % of suitable habitat in conservation areas without scientific justification, makes faulty assumptions about the value of burned habitat to owls, proposes fuel and salvage treatments that are likely to reduce habitat effectiveness, and provides inadequate recommendations for the contribution of nonfederal lands to recovery. Apparently the proposed barred owl control program is expected to offset the significant reduction in habitat protection currently afforded by the NWFP, but that is a scientifically unjustified assumption even if barred owls are shown to be a significant threat to spotted owls…."*

- Reduces, from current standards, the acres of suitable habitat that will be included in owl conservation areas.
- Reduces the number of owl locations that will be included in owl conservation areas.
- There would be a range-wide reduction of 35% of acres currently included in LSRs for the NWFP. If other allocations were not retained in the LRMPS [*Land Resource Management Plans*], there could be reductions of 64% of acres included in MLSAs [*Managed Late-Successional Areas*], 99% of Riparian Reserve acres, and 95% of AMA [*Adaptive Management Areas*] acres. Reduction of LSRs and MLSAs would have direct effects on nesting, roosting and foraging habitat for owls.
- Reduction in Riparian Reserve acres would be significant to owl conservation as the NWFP considered those areas to constitute key dispersal habitat.
- Loss of conservation measures for owl locations could be particularly significant, as it will potentially affect more than a third of those locations currently under a protective land use allocation.
- There have been no recent studies to update knowledge of dispersal habitat, and the present plan is seriously deficient in its lack of strategy to adequately address management of dispersal habitat. Such management is necessary because spotted owls do not forage effectively in cutover lands and their survival is poorer in these landscapes.

SCIENTIFIC FLAWS IN OPTION 2

"Option 2 appears to be an ad hoc effort to reduce protection of the owl from the standards applied in Option 1. In addition to the flaws identified in Option 1, Option 2 drastically reduces protection for owl habitat and maximizes flexibility given to land managers by allowing them to operate under a series of nebulous rules. This option will lead to direct loss of owl habitat through logging. It suggests a desire to return to the era of failed government conservation plans developed in the 1980s, which ultimately led to the owl's listing. In essence, the assessment by Thomas and Verner (1992) that economic considerations drove the lack of effective conservation plans seems particularly evident in Option 2. Furthermore, with decreased protection of suitable habitat, Option 2 retains the same (and overly optimistic) recovery estimates of time and identical expenses as Option 1. Even more perplexing are the contradictory assertions in the document that both options are the "best" option."

- For instance, if in the Western Oregon Cascades large habitat blocks were located in the same areas and in the same numbers as MOCA1s there would be a reduction from the 1,461,180 total acres in MOCA1s to 720,000 acres in large habitat blocks – a 50 percent reduction while purporting to use the same rule set. Nowhere is the magnitude of this reduction made evident in the 2007 Plan.
- Olympic Peninsula Has No Large Habitat Blocks Except For National Park Service Land…… Such an approach will exacerbate an already precarious situation for the owl on the Olympic Peninsula.
- Option 2 mandates no connectivity from the Olympic Peninsula to other provinces (areas of appropriate habitat within the region). The spotted owls on the Olympic Peninsula are the most isolated of any current group, yet this option actually mandates no connectivity with other provinces. Again, there are no analyses or data presented to support the absence of connectivity.
- No provision for connectivity using federal lands in Coast Province of California.
- Eliminates distance limits for habitat blocks in Coast Province of California.
- In sum, the above four differences represent particularly damaging actions that increase the jeopardy of the spotted owl in many of the very geographic locations where its status is currently most vulnerable.
- It is simply unrealistic to expect this approach to result in a credible reserve system while each management unit applies its own interpretation of the "rule set" to achieve multiple and varying land use goals.
- Indeed, dependence on such a management system in the 1980s was one of the reasons for the owl's listing ("failure of existing regulatory mechanisms"), and the need for coordination would not be adequately addressed by the 2007 Plan.
- A critical component for the public's understanding of the plan is impossible to provide for Option 2 because habitat blocks will only be delineated at some future date by local managers.

OVEREMPHASIS OF BARRED OWL THREATS

Focusing on barred owls as the number one threat to spotted owls while at the same time decreasing habitat conservation for spotted owls is not justified from either scientific or conservation perspectives.

- An approach placing primary emphasis on controlling barred owls is incredibly risky and unlikely to lead to recovery by itself.
- To rely on untested efficacy of barred owl control to provide sufficient "relief" for spotted owls to prosper despite their current declining populations while allowing a significant decline in their habitat is not biologically warranted.
- The most promising strategy to employ, at present, is a combination of habitat conservation and research.

FAULTY HABITAT ASSUMPTIONS AND THRESHOLDS

The goals for the amount (%) of acres of suitable owl habitat to be retained in MOCAs [Managed Owl Conservation Areas] in each physiographic province were established with faulty assumptions and approaches that were not based on sound statistical methods.

- The selective use of the scientific literature by FWS is not appropriate and leads to erroneous recommendations.
- The goals for the amount of suitable habitat in MOCAs in each physiographic province were not based on sound statistical methods for several reasons.
- The scale of FWS' analyses of the habitat data and application of results to management guidelines for northern spotted owls are inappropriate.
- Lastly, the specification of the amount of suitable habitat within a physiographic province or breeding territory implies that the remainder of suitable habitat above that goal may be available for harvest at some time in the future (although the 2007 Plan states that this is not the case at the current time).
- In summary, this section is not based on appropriate scientific analysis and inference and should not be applied to recovery goals for the species under either of the options.

TREATMENT OF FIRE ISSUES IS FLAWED

…the 2007 Plan's presumption of the need to treat large acreages to reduce fire hazards and potential loss of owl habitat is not based on sound science and may have a negative effect on spotted owls.

- New science indicates spotted owl use of burned habitat is greater than anticipated.
- The 2007 Plan does not include the results of recent research on fire impacts on spotted owls.

- …. spotted owls use burned areas, perhaps preferably after a few years of understory regrowth, and such areas do not become unsuitable as assumed in the 2007 Plan.
- …. spotted owls are resilient to fire, and that considerable research is still needed due to existing uncertainty.
- With the existing uncertainty, the presumption in the plan (outside of Appendix A) that fire is detrimental and leads to habitat loss is not scientifically defensible.
- In addition, the 2007 Plan's assumption that fire renders habitat unsuitable may result in salvage logging of habitat that is actually still suitable for owls.
- No published literature describing the response of spotted owls to thinning or prescribed fires used to reduce fuel is cited in the 2007 Plan.
- This appears to be a major knowledge gap the plan does not acknowledge, making the assumptions mere speculation.

GUIDELINES FOR POST-FIRE (SALVAGE) LOGGING WILL RESULT IN LOSS OF HABITAT FOR OWLS

Because the recovery plan lacks any scientific basis for providing logging guidelines, and burned habitat may be important to spotted owls, these guidelines should be discarded and forest affected by fire should be managed like other habitat that is important to spotted owls.

- The preliminary research by Clark indicates that areas logged after fire tend to be avoided.
- This is not surprising because logging removes many of the structural components that spotted owls and their prey are associated with after fire, particularly downed logs, snags, and structural diversity.

RECOMMENDATIONS FOR CONTRIBUTIONS OF NONFEDERAL LANDS ARE INADEQUATE

….there are many areas throughout the owl's range where the amount or distribution of federal lands are inadequate to achieve recovery, so that nonfederal lands must make contributions toward recovery.

- The Conservation Support Areas in the 2007 Plan apparently were designed to accomplish this task, and FWS is commended for including these areas in the plan.
- Unfortunately, the number of these areas and the management guidelines for them are inadequate to accomplish this task. Furthermore, there are numerous loopholes that likely will prevent the kind of management that is currently needed.
- This is particularly the case for the state of Oregon where only 1 large and 3 small conservation support areas are designated. For example, the Elliott, Tillamook, and Clatsop State Forests in the Coast Range of Oregon were identified in the

1992 draft Recovery Plan as state-owned lands that should contribute habitat for nesting owls; however, these lands are neither mapped nor even mentioned in the 2007 plan.

- In fact, the acreage of the Conservation Support Areas in Oregon (575,385 acres) is considerably less compared to that of Washington (2,159,449 acres) or California (1,028,721 acres), and they are comprised mostly of federal lands (see page 166). In addition, the function for these lands in Oregon is mostly for dispersal habitat that is a much lower standard or requirement than that for nesting habitat. Consequently, the extent and function of the Conservation Support Areas in Oregon are inadequate.
- The state of Oregon should contribute to recovery commensurate with the states of Washington and California.
- Most importantly, all of the guidelines for the Conservation Support Areas are "voluntary" or "encouraged" (see pages 39 and 40), which historically has been a prescription for decline in habitat and populations of spotted owls. The guidelines for the Conservation Support Areas should be mandatory until populations of spotted owls are fully recovered, and the extent of the areas protected under the current plan should equal or exceed that in the 1992 draft Recovery Plan…..

SCB-AOU PEER REVIEW

SCIENTIFIC FLAWS IN OPTION 1

"Option 1 largely fails because it protects less habitat than under the current NWFP. For reasons discussed above and in light of current data, no rationale argument exists for reducing the amount of protected habitat at this time."

- In fact, in the context of increasing threats to the spotted owl (e.g., barred owl invasion, West Nile virus) the total area protected in reserves should be increased, not decreased.
- Using the results from these two studies to set hard thresholds is not supported by the data and incorrectly interprets the precision of their results.
- ….. there is no evidence from the southern part of the owl's range that the amount of young forest is limiting and therefore should be the target of management in the reserves. It is much more tenable that nesting habitat (i.e., late successional forest) remains the primary limiting factor.
- ..option 1 defines as "high-quality habitat" habitat that is used by 90% of the known spotted owl pairs for nesting and roosting in a given province. This is a very broad definition and will surely include sink habitat which cannot support a viable population over the long-term…..
- Although there may well be something to the information presented in Figure D.1 (page 134), the curves would be difficult to justify given the sparse information (I'll assume that the Y axis is for survival too). In particular, survival of adults in areas where the "percent nesting habitat" ranges from about 58-78% is essentially flat. Given these data, there just seems no way to justify predicting an inflection point. I understand that these are the best data available for California and that

something needs to be set; however, I'm uncomfortable with setting these values at the visual center of some imaginary relationship; instead, I'd argue the levels for this very important element should be set quite a bit more conservatively. I also struggled with how some of the accounting would work.

- Frankly, if I were making this decision, I would suggest 80% as a target given that we are always likely to be below these targets rather than above them **[note – this particular comment is in response to the low levels of habitat 50-70% in the draft recovery plan for the MOCAs].**

SCIENTIFIC FLAWS IN OPTION 2

"Option 2 fails to provide for spotted owl recovery in a number of ways. First, it fails to protect the current amount of suitable habitat in the existing reserve system. The option claims not to be a reserve design strategy (no lines on the map) but at any point in time it would have to be represented by lines on the map—otherwise, the manager would not know where on the landscape activities such as clear-cut timber harvest and road construction could occur."

- Option 2 has the stated potential advantage of being more dynamic, compared to Option 1 (although the extent to which that is so is not clear), but its vagueness makes it susceptible to being fulfilled at a minimal and likely insufficient level.
- A second way option 2 fails is that it provides no measurable objectives to assess the owl's progress towards recovery. The relations between owl demographic performance and habitat would not be amenable for study because the exact locations of suitable habitat on the landscape would apparently be unknown.
- There is little evidence that a single agency, let along multiple agencies, can manage a dynamic reserve structure like that proposed in Option 2.
- Based on the past management history of the Forest Service and BLM in regards to spotted owls, there is every reason for the public to insist on designated reserves areas and lines on maps. In fact, the reason we have a NWFP is because of past management failures by federal land managers.
- Option 2 is so poorly described in the Draft Plan that it is impossible to understand how much habitat will be conserved for the spotted owl and how this acreage compares with the amount of habitat conserved under the NWFP. It is probably a safe deduction that the amount of protected late successional forest is less than what is currently protected.
- Although I could never quite glean exactly how Option 2 would be implemented (perhaps I missed it), I am skeptical that it would work in practice. One reason is the inherent time-scales that recovery of old forests require which is on the order of hundreds of years. The bookkeeping along in this sort of dynamic accounting worries me, especially when the accounting needs to be accomplished across multiple agencies.

OVEREMPHASIS OF BARRED OWL THREATS

"…my impression is that the threat posed by barred owls, while real, inappropriately dwarfs habitat loss in the draft plan. For barred owls to be the appropriate primary focus, we would have to be convinced that the strategy outlined for conserving habitat is sufficient to overcome the documented demographic problems identified throughout their range. That is, it seems likely that existing habitat-based conservation efforts might be insufficient to stem declines in spotted owl populations. If this is true, management of barred owls might, at best, only serve to slow the rate of decline."

- The Executive Summary is even more blunt, stating flatly that competition from the barred owl is "The most important threat facing the spotted owl". However, there is no evidence in Appendix C or anywhere in the main document (or in the peer-review literature) to support this ranking whereby barred owl competition is "more important" than loss of habitat.
- …. the dichotomy focusing on barred owl competition instead of habitat loss would be ineffective in the long run; the influx of barred owls into spotted owl range is a result of anthropogenic forest change (loss and degradation) favoring one species (barred owls) at the expense of another (spotted owls). Thus, the long-term solution to the barred owls problem is inextricably bound to the issue of habitat loss and degradation, a point little noted in the draft recovery plan.
- Although barred owl removal is *necessary* for spotted owl recovery, it is not *sufficient* without addressing the habitat loss and degradation issue. Thus, I would recommend that barred owl competition be considered as a subset of the habitat loss / degradation perturbation, such that particular recovery actions could be implemented to decrease the barred owl influence on spotted owls without implying that such actions, by themselves, would be sufficient to recover spotted owls.
- "Ongoing Actions" for both Options (pages 20 and 26) include the threat posed by the barred owl and addressing fire risk areas, but say nothing about logging… Habitat loss due to logging was a primary driver of the original listing decision, and new habitat has not regenerated faster than subsequent logging has decreased habitat amount (p. 130), so there is no reason to exclude logging as a major current and future issue of concern to owl recovery.
- If barred owls and spotted owls are competing for nesting sites inside of the MOCAs, then to maintain locally stable spotted owl populations the reserves should be made larger, not smaller.
- Lack of regulatory safeguards and habitat loss are the two primary threat factors that led in 1990 to the listing of the spotted owl under the Endangered Species Act. Habitat loss from timber harvest remains the sole threat for which there is extensive supporting scientific information. In contrast, little scientific information on potential adverse effects of barred owl range expansion is currently available.
- Primary emphasis on the barred owl is misplaced at this time because of the lack of supporting evidence.

FAULTY RULE SET APPLIED IN OPTIONS 1 & 2

- During the time the Recovery Team was in deliberation, it would have been possible to apply the McKelvey model to the current landscape in the Pacific Northwest. The model could have been parameterized with the latest estimates of the vital rates (Anthony et al. 2004, 2006) and it could have been intersected with current habitat maps (see Lint 2005). Unfortunately this was not done—the Recovery Team instead made reference to an outdated rule set and did not use the best available scientific information.

ADDITIONAL INADEQUACIES REGARDING HABITAT PROVISIONS

- The bolded sidebar on page 59 implies that early seral and non-forest components improve owl productivity and survival, but the science in the document supports that statement only to a limited extent, and only in one limited geographic area, the southern part of the range.
- .. the directives would allow the "small habitat blocks" to support just 1 pair (within the 1-19 range). Also, pages 65-66, describing the option 2 rule set, uses non-binding language such as "strive for", "at least one", "whenever possible.