
habitat-relationship study

Summary: WDFW, NWIFC, Point No Point Treaty Council, Northwest Forestry Association, Society for Conservation Biology, and Bogle & Gates (a consultant to Washington State University) made comments pertaining to the habitat relationship study component of the murrelet alternatives. Comments were: (1) All potential marbled murrelet habitat in southwest Washington (South Coast and portions of the Columbia Planning Units) should be surveyed for murrelet occupancy; (2) There is no scientific basis for allowing the release of habitat that would support 5 percent of potentially occupied sites; (3) The Tribes should be involved in reviewing the data collected in the habitat relationship studies; (4) The HCP and No Action strategies for the marbled murrelet regarding the habitat relationship study are indistinguishable; (5) No data is presented as to how much suitable habitat will be deferred and no estimates are provided as to how much marginal habitat will be released after the habitat relationship study has been completed; (6) We know little about how the time scale and magnitude of change of habitat surrounding occupied sites will affect murrelet breeding and fledging success thus only protecting habitat around occupied sites may prove inadequate; and, (7) It not scientifically credible to defer all timber sales in potential murrelet habitat on almost a complete dearth of data.

Questions regarding the habitat relationship studies included how intensive a survey effort will be conducted during these studies, and will the effort be adequate to find all or even a majority of the occupied sites?

Response: Surveying all potential murrelet habitat in southwest Washington would constitute a lower risk strategy for the species in that portion of its range. The Service, however, thinks that the proposed strategy, including retention of surveyed, unoccupied habitat is a sufficient conservation approach.

The strategy which allows release of marginal habitat that supports 5 percent of the potentially occupied sites is a management proposal that has scientific data suggesting that this release would not cause a large impact to the population (see response in section above, and DEIS p.4-121).

The commentor is correct in noting that the same type of habitat relationship study would be conducted under the No Action Alternative as under Alternative B. The important difference however, is that the No Action Alternative does not specify what will be done with the information gathered in this study, nor is there any commitment to continue deferral of potential habitat or to survey remaining habitat for occupancy.

The Service has the ability to bring in third parties, including the Tribes, for technical assistance in reviewing the results of research conducted as part of the marbled murrelet conservation strategy.

The draft HCP does not contain estimates of the amount of potential habitat that could be deferred during the habitat relationship studies and inventory surveys or the amount that could be released as marginal habitat. These estimates, and the methods for deriving them are described in detail in the DEIS (p. 4-111 through 4-118).

The commentor who noted that we know little about how the time scale and magnitude of change of habitat surrounding occupied sites will affect murrelet breeding and fledging success is correct. The research program associated with the murrelet strategy is designed to study the level of protection required around occupied sites to allow successful reproduction. Questions of the amount of habitat needed at larger scales (e.g., watersheds) will also be examined. The long-term conservation plan is to include occupied site management plans as well as landscape-level measures to reduce gaps in distribution of habitat. The interim strategy should protect adequate amounts of habitat to allow for needed management options once these research questions have been answered.

The Service and DNR disagree that it is not scientifically credible to defer timber sales in potentially suitable habitat. There is not a dearth of data regarding the types of habitat in which murrelets have been observed thus far. There is adequate data upon which to design further research to refine current understandings of murrelet nesting habitat relationships. To not defer timber sales in potential habitat would remove both the ability to learn more what murrelets need and the management flexibility for future conservation options.

The habitat relationship studies are designed to examine a large enough sample of forest stands with a range of habitat characteristics to establish statistically meaningful relationships between habitat types and occupancy. The studies are not intended in and of themselves to accomplish a full inventory survey of habitat on DNR-managed lands. Once habitat relationships have been established, protocol surveys will be conducted to inventory habitat that supports 95 percent of the potentially occupied sites on DNR-managed lands (draft HCP p. III.43-46).

marginal habitat

Summary: The NWIFC, Point No Point Treaty Council, the Tulalip Tribes, Northwest Ecosystem Alliance, Washington Wilderness Coalition, a local chapter of the Audubon Society, and Bogle & Gates

(a consultant to Washington State University) commented on marginal murrelet habitat. Six commentors stated that marginal habitat should not be released for harvest while the long-term strategy is developed. One commentor wrote that too much marginal habitat was being protected.

Response: The deferral of all suitable habitat, both marginal and higher quality would be the conservative approach that could be taken. It would also constitute a “no take” strategy which does not fit the purpose and need of DNR. It was determined in the DEIS that the benefits of Alternative B outweigh the small reduction in population size that would result through the release of marginal habitat and would not reduce the likelihood of recovery of the population. The Service will make a final determination of the adequacy of the proposal in the Section 7 consultation. The Service does think that release of more marginal habitat than is proposed in Alternative B could pose an unacceptable risk to the species.

unoccupied habitat

Summary: WDFW, Washington Wilderness Coalition, and Bogle & Gates (a consultant to Washington State University) made comments pertaining to unoccupied murrelet habitat. One commentor requested that DNR commit to a schedule for carrying out its research proposals in order to ensure that suitable but unoccupied habitat is not completely harvested before the long-term plan is complete and thus future management options can be retained; one commentor requested that suitable but unoccupied habitat be retained as described in Alternative C; and one commentor requested specific information regarding how much timber on Washington State University trust lands would be available for harvest if suitable but unoccupied habitat were made available for harvest within the first two years of the HCP.

Response: Language in the HCP has been modified to reflect a commitment to conduct each sequential step of the conservation strategy with no time gaps. Negotiations with the Service on the long-term conservation plan for each planning unit will begin within 12 months of the completion of inventory surveys. The HCP has also been changed so that all surveyed, unoccupied habitat will be retained in southwest Washington until the long-term plan has been completed, or until 12 months have passed since negotiations have commenced on the plan. Suitable but unoccupied habitat will be released in the other planning units. The request for specific information regarding Washington State University lands is outside the scope of this process.

occupied habitat

Summary: The Society for Conservation Biology and the Northwest Forestry Association made comments relating to occupied marbled murrelet habitat. One commentator wrote that the proposed habitat relationship study was inadequate to be able to estimate site occupancy and that data needed to be collected regarding reproductive success, predation rates and site abandonment rates if habitat relationships are to truly reflect murrelet habitat preferences. The other commentator wanted clarification and an upper estimate of how much potential occupied murrelet habitat would be off base and for how long under the HCP murrelet strategy.

Response: The proposed habitat relationship study will be adequate to determine site occupancy, as it will use protocol surveys that have a high likelihood of determining if a forest stand is occupied by murrelets. The study will, by itself, be inadequate to answer further questions of how habitat characteristics relate to reproductive success. These questions will be examined as part of larger cooperative research programs on murrelet nesting ecology.

The upper estimate of how much habitat would be off-base to harvest under the proposed HCP is described in the DEIS. There is a total of 60,664 acres of estimated potential murrelet habitat within 50 miles of marine waters that will be deferred during the habitat relationship studies (DEIS p. 4-116). Some portion of this will be released as a result of the habitat relationship studies. Estimates based on current occupancy rates are that 38,442 acres of this habitat will be retained at least until the long-term plan is completed (DEIS p. 4-117).

marine issues

Summary: The Muckleshoot Indian Tribe commented on marine issues related to the marbled murrelet. They requested that the HCP be modified so that new fishing restrictions would not be established without first assessing the possibility of increasing habitat protection (refer to the draft HCP p. III.41 and 43).

Response: The description of threats to marbled murrelets in the marine environment contained in the murrelet ecology section of the draft HCP is intended for background information. DNR's HCP does not cover fishing restrictions as these are outside of the department's jurisdiction regarding trust land management.

ii. Raptors

(A) spotted owls

Summary: WDFW, Muckleshoot Indian Tribe, Tulalip Tribes, The Yakama Indian Nation, City of Port Angeles, Sierra Club, Society for Conservation Biology, The Wildlife Society, The Mountaineers, Washington Forest Protection Association, Northwest Ecosystem

Alliance, Tahoma Audubon Society, 13 individuals, and Bogle & Gates (a consultant to Washington State University) made general comments pertaining to spotted owls. The majority of comments took the general position that the proposed strategy was inadequate for owl conservation on DNR-managed lands. Several organizations and individuals commented that Alternatives B and C would result in the extinction of the owl; two individuals commented that Alternative A would provide the best protection for owls. Other specific comments of this nature included a request that the HCP should use demographic restoration and enhancement as another category of lands; the conservation objective for the spotted owl should be to restore nesting, roosting, and foraging habitat throughout DNR-managed lands; the impact to spotted owl site centers in eastern Washington was out of proportion to the level of mitigation provided; the overall conservation strategy for spotted owls is minimal and there should be more provided from the outset; the plan will wipe out half the owls on DNR-managed lands; a population viability analysis should be done on the HCP proposal; the range of the owl will be reduced under the combination of DNR's HCP and the proposed 4(d) rule; the DEIS should include an analysis of the 4(d) rule. Two commentors felt that the HCP should provide less protection for spotted owls than the current proposal. One of these commentors noted that spotted owls live in second growth; the other felt that past harvest restrictions on the Olympic Peninsula for spotted owls were not based on sound scientific information. One commentor also expressed concern that the DEIS underestimated the amount of spotted owl habitat that would be provided under Alternative A.

Response: There are several reasons why it is unlikely that Alternatives B or C would result in extinction of the owl. First, the proportion of total habitat on all ownerships in both eastern and western Washington (outside of the OESF) that occurs on DNR managed lands is small compared to the proportion of habitat on federal reserve lands. In western Washington, 55 percent of all habitat occurs on federal reserves, while between 6 and 14 percent of it occurs on DNR-managed lands (DEIS p. 4-64). In eastern Washington, 60 percent of all habitat occurs on federal lands, while only 6 percent occurs on DNR lands (DEIS p. 4-212 and 213). Under the President's Northwest Forest Plan, habitat conditions are expected to improve on federal reserves over time. Thus, the likelihood that either Alternatives B or C, which both make nonfederal contributions of habitat in areas identified by the Northern Spotted Owl Recovery Team and other owl conservation planning efforts to be important to the population, would result by themselves in the extinction of the species. Second, in the long term, Alternatives B and C would provide demographic support to spotted owls at a higher level than Alternative A. Given that both Alternatives B and C provide habitat in support of medium to large clusters of owls on or near federal reserve lands and that the USFWS determined in its biological opinion for the President's Northwest Forest

Plan that the owl had a high chance of persistence over the next 100 years, it is unlikely that either of these Alternatives would cause extinction of the species. In addition, the USFWS will not issue an ITP to DNR if it determines in its Section 7 consultation that the proposed HCP would impair the long-term survival of the spotted owl.

The Service and DNR disagree that Alternative A is better for spotted owls than either Alternatives B or C. The DEIS demonstrates that over a 100 year period, Alternative A contributes the least to spotted owl conservation. Because of near-term take of spotted owls under both Alternatives B and C, Alternative A provides a higher level of protection for the next 10 to 20 years. However, because of the incentive to keep habitat levels at a minimum (40 percent within existing owl circles) and the disincentive to allow forests to develop into habitat under Alternative A, conditions for the owl would very likely deteriorate over time.

If DNR were to adopt a conservation objective to restore spotted owl habitat on all the trust lands it manages, the agency would probably be acting in violation of its trust duties. In addition, such a standard is beyond what is required for issuance of an ITP under Section 10 of the Endangered Species Act.

The Services and DNR disagree with the commentor who said that the impact to spotted owl site centers in eastern Washington was out of proportion to the level of mitigation provided. The DEIS stated that there are approximately 67,500 acres of suitable spotted owl habitat on DNR-managed land in eastern Washington. The DNR has estimated that over the short term, approximately 44,400 acres of this owl habitat would be located in owl circles and unavailable for harvest. This habitat would be sparsely distributed, fragmented, and would decrease in quantity over the long term. The proposed HCP provides 19,600 of NRF habitat and 42,500 acres of dispersal habitat in close proximity to federal reserves. The strategic placement of DNR-managed habitat with respect to federal reserves and the long-term certainty for the existence of this habitat is thought to be adequate mitigation for the short-term adverse impacts to owl site centers. Furthermore, more mitigation would not have satisfied a main purpose of the proposed action, namely, "produce the most substantial support possible" for the trusts.

In designing the conservation strategies for the HCP, DNR has to satisfy two main legal obligations. The first is compliance with issuance criteria under Section 10 of the ESA, the other is to produce long-term income for the trust beneficiaries. The spotted owl strategy was developed to provide support to the federal population as a way to not appreciably reduce the likelihood of survival and recovery of the species, while allowing DNR to fulfill its trust obligations. The draft HCP represents what DNR considered to be the most reasonable balance of its conservation and trust duties. Through Section 7 consultation, the Services will determine

whether the proposal meets the biological criteria established under Section 10 of the Endangered Species Act.

To say that the proposed HCP will “wipe out” half the owls on DNR-managed lands is an overstatement of impacts. The HCP would, if adopted, have negative impacts on between 123 and 151 known and projected site centers whose regulatory circle overlaps DNR-managed lands. These sites would be at risk for incidental take and they represent between 40 and 49 percent of known and projected sites that influence DNR-managed lands. However, “take” based on the 40 percent guideline is a regulatory concept. When the amount of habitat in a circle that approximates a median annual home range falls below 40 percent, mortality does not necessarily ensue. Impairment of reproductive success may result, as may displacement. At some point, if the nest site is harvested, or enough habitat is removed to make survival impossible, mortality may occur. Another element to consider is that for most of the site centers that influence DNR-managed lands, DNR is not the major contributor of habitat. For between 73 and 80 percent of sites, habitat on DNR-managed lands constitutes less than 10 percent of the area of a median home range size circle to each site. In eastern Washington, habitat on DNR-managed lands amounts to less than 2.5 percent of the area of a median home range radius circle at 45 percent of the sites. In western Washington, 47 percent of sites that influence DNR-managed lands fall in the same category. Outside of NRF management areas proposed in the HCP, there are only three sites on the west side in which DNR-managed lands contribute more than 20 percent of the circle in habitat. In contrast, NRF areas on the west side include 14 sites in which DNR lands contribute more than 20 percent of the circle in habitat. DNR’s management activities do not exert the main influence on most of the circles that overlap its lands outside of proposed NRF management areas.

Quantitative population viability analyses require models and data on how owl populations respond to factors that affect their ability to persist into the future. Such factors include changes in demographic attributes of the population, degree of genetic variation within and among individuals in the population, variation in behavioral attributes of individuals within the population, systematic and catastrophic losses of habitat, changes in distributional patterns of habitat (e.g., fragmentation), interspecific interactions such as competition and predation, and the effects of disease pathogens and environmental contaminants (USDA 1992; USDA and USDI 1994). Existing data for these factors is either insufficient or non-existent in most parts of the owl’s range, making a meaningful population viability analysis impossible to conduct at this time. Risk analysis of all proposed and accepted management plans (e.g., the President’s Northwest Forest Plan) for spotted owls continues to rely on professional judgement based on an incomplete understanding of even such factors as

demographic trends for which five to eight years of quantitative data exists. DNR's proposed HCP is no different.

The Services and DNR agree that the combination of DNR's HCP and the 4(d) rule will contribute to the contraction of the current and historical range of the spotted owl.

The 4(d) special rule-making process has not yet been completed. Thus, the possible action of implementing a 4(d) rule is still too speculative to allow analysis as a complete alternative. The cumulative effects of DNR's HCP and the proposed special 4(d) rule are described in the DEIS (p.4-93 and 94 and p. 4-235 and 236).

The fact that spotted owls have been located in second growth forest does not provide any justification for DNR to provide a lower level of protection for spotted owls than what is provided in the draft HCP. The strategy is actually based primarily on the hypothesis that spotted owls can use managed forests to meet at least part of their life needs. This hypothesis is based on observations of owls in landscapes that contain structural remnants of old growth in otherwise disturbed stands - either from natural or human management processes. DNR's proposal contains a large research and monitoring component to verify this hypothesis. There are many questions that remain unanswered about the extent to which spotted owl populations can survive and reproduce in managed landscapes and the amount and distribution of structural components that adequately provide nesting, roosting, and foraging functions. The DNR strategy would not have been proposed in its current form without the existence of large blocks of unmanaged old-growth forest that will be in reserve status on federal lands.

The rationale behind the conservation strategy for spotted owls in the OESF planning unit is explained on pages IV.74-75 and IV.88-90 of the draft HCP. It was developed in consideration of available information on owl and forest ecology as well as current and predicted future land-management trends in the context of the long-term vision for the OESF that was derived from the 1989 report of Commission on Old-growth Alternatives for Washington's Forest Trust Lands (see pages I.14-15 of the draft HCP).

The Services and DNR disagree that the amount of spotted owl habitat that would be provided in Alternative A was underestimated in the DEIS. The estimate is based on how DNR would continue to implement its Forest Resource Plan policy without an HCP. In addition, the data used to approximate the total amounts of potential spotted owl habitat results in many cases in an overestimation of the amount of habitat on DNR-managed lands (see DEIS p. 4-16 - 4-18). Furthermore, many forest

stands that contain the structural attributes of habitat may be too small and or too isolated to function as spotted owl habitat on a landscape level.

population impacts & models

Summary: NCASI, The Northwest Forestry Association, the City of Port Angeles, the Port of Port Angeles, three individuals, and Bogle & Gates (a consultant to Washington State University) commented on spotted owl population issues and population models used in the DEIS. Four commentors stated that the Olympic Peninsula population has exceeded recovery goals set in the Recovery Plan, or that recent population studies have demonstrated that the population is not in decline. Some of these commentors further stated that DNR should take this “new” information into account in its conservation planning and decrease the level of protection for owls in the OESF. One commentor wrote that the DEIS inaccurately described the impacts of the unzoned forest alternative compared to No Action to the owl population in the OESF. Two commentors provided detailed technical comments regarding the population models used for both the non-OESF and the OESF portions of the HCP in the DEIS. One of these commentors felt that DNR deliberately manipulated spotted owl demographic data in the estimates of future take used in the DEIS to present an overly optimistic picture of the current status of the population in Washington State. This commentor presented alternative models using the rates of population decline that ranged from 1 percent per year to 12 percent per year. He concluded that higher rates of decline were more realistic and that if the population was declining at a rate of 4.5 percent as opposed to 1 percent as presented in the DEIS that the HCP would contribute to the extinction of the owl. The second commentor’s remarks were specific to the model used for the OESF. This commentor wrote that demographic rates used in the model from Burnham et al. (1994) were too pessimistic and that more recent data from Forsman et al. (unpublished) should be used or some justification given for using the older data. Another point of concern was the lack of statistical justification for the habitat quality index. The commentor felt that the speculative nature of this index should be emphasized in the text. This person also recommended the use of data which shows that precipitation has more of a statistically significant effect on owl reproductive success than amount of habitat within an owl territory.

Response: DNR did not manipulate data used in its projections of future take to present an overly optimistic picture of the current status of the population. DNR used existing data, with all assumptions about its use of that data clearly stated, to present a worst case scenario for DNR’s impacts on spotted owls in NRF Management Areas. DNR used the upper limit of the 95 percent confidence estimated for λ , the population’s rate of change, in its projections for

future take (DEIS, p. 4-64 and 4-213). The commentor wrote that using this value rather than the mean was unconscionable. DNR contends that the methods and data selected for any population estimate depend on the objectives of the estimate. The projections the commentor refers to in the DEIS were intended to show a worst case scenario of future take. Models using a higher value for λ , i.e., the upper limit of its 95 percent confidence interval, would project more owls in NRF Management Areas, and therefore, a higher likelihood for incidental take in the future. Models using a lower value for λ , i.e., the mean, would project fewer owls in NRF Management Areas and DNR's proposed HCP would be projected to have much less potential for incidental take over the long term. As stated in the DEIS (p. 4-64 and 4-204), the FSEIS for the Northwest Forest Plan (USDA and USDI 1994a, p. 3&4-233) explained that high values for λ are more consistent with observations of owl densities over the period of time to which the demographic data applies. According to USDA and USDI (1994a), a 4.5 percent per year decline ($\lambda=0.955$) is highly unlikely. Furthermore, the DEIS did not use λ to draw any inferences about spotted owl populations outside of the OESF planning unit.

The Draft Recovery Plan described region-specific "biological goals" for habitat protection, and projected the numbers of owls that might be supported after habitat recovery. Those goals were for habitat protection and recovery, not for owl numbers and do not alter the context in which the HCP proposal was developed (see draft HCP, p. II.5 through 10). The conservation strategy for the OESF was developed in light of current estimates of owl population numbers and trends on the Olympic Peninsula (see draft HCP p. III.15 through 18 and DEIS p. 4-308 to 311), thus the draft HCP proposes a conservation strategy in which there is a reduction in the amounts of habitat in the near-term.

The population model was only one of several means used to evaluate alternatives for the OESF, and was intended to provide qualitative, objective comparisons among those alternatives, not numerically accurate predictions of the outcomes of those alternatives. Thus, demographic rates used in the modeling effort were chosen to be reasonably consistent with then-published analyses (i.e., Burnham et al. 1994, Holthausen et al. 1994). With the exception of juvenile survivorship, all of the demographic parameters were taken from (or tuned to) Burnham et al. (1994) and Forsman et al. (1984), with some guidance from Holthausen et al. (1994). We used a set of juvenile survival rates (0.38, 0.41, 0.44, 0.47, 0.50, 0.51 in the DEIS, Appendix D, Table 5) which represented a range of plausible values, considering adjustments for juvenile emigration. These values were greater than the Burnham et al (1994) estimates, but less than the larger estimates presented in Holthausen et al. (1994). Coincidentally,

the model runs discussed in the DEIS (Chapter 4, p. 4-321 to 324, 4-329 to 331, and 4-336 to 348) were performed with adult survival rates approximately equal to those reported by Forsman et al. (in press).

The commentor makes a legitimate point about the statistical validity of the habitat quality index used to define a gradient of quality across the spectrum of young- to old-forest habitat (DEIS, Appendix D, p. 8 and 9). As the commentor suggests, readers should understand that the index is based on empirical observations, is consistent with knowledge of habitat relationships of owls in the western hemlock forest zone, and is intuitively reasonable, but it is also speculative and has not been validated by rigorous statistical analyses.

It is evident that spotted owl populations respond to other environmental features than forest structure (e.g., Irwin 1993, Seaman 1995). This was noted in developing the habitat parameters for the population model in that an elevation/climatic model (Henderson et al. 1989) was used to classify some old forests as non-habitat (DEIS, Appendix D, p. 8). Modeling that more accurately reflects reality is always desirable, however the population model was developed and model runs were completed before Knight and Seaman (1995) made their preliminary presentation on the relationship between weather and spotted owl fecundity. While those results appear to have substantial explanatory power, they have not been fully peer-reviewed. And even if they prove to have substantial explanatory power, the model results used in the DEIS are sufficient to provide objective, qualitative comparisons among HCP alternatives because weather patterns are relatively homogenous across the OESF area of the Olympic Peninsula.

nesting, roosting, & foraging (NRF) habitat

Summary: The Yakama Indian Nation, the NWIFC, Society for Conservation Biology, a timber company, seven individuals, and Bogle & Gates (a consultant to Washington State University) submitted general comments pertaining to spotted owl nesting, roosting, and foraging habitat. The majority of the commentors requested stronger protection measures for spotted owl habitat than is provided in the HCP. One commentor wrote that less protection could be provided. One commentor noted that the landscape assessment process that will be used to determine habitat conditions within NRF management areas is not described in detail in the HCP nor is the time line for completion of these assessments. This commentor requested that this information be disclosed in the final HCP.

Other specific comments were: (1) The owl population cannot wait 100 years for habitat to recover in NRF areas; that it is presumptuous to assume that owls will use habitat set aside for them if they are not already there; (2) That no more than 20 percent of the required habitat in NRF areas should be in a sub-mature condition - the remainder should be higher quality habitat (3 commentors); (3) None of the alternatives provides maintenance of species distribution in southwest Washington or the rest of the western Washington Lowlands province therefore an ITP should not be issued because the HCP will not allow for long-term survival of the owl; (4) There is no evidence to support a strategy that allows habitat to move over time within NRF areas thus requiring owls to reestablish their territories; (5) The amount of replacement spotted owl habitat should eventually exceed what is harvested under the HCP; (6) Based on the forest habitat type comparison in Chapter 2 of the DEIS, it appears that the No Action alternative will provide more habitat for spotted owls than the HCP proposal, yet the DEIS portrays the HCP as a better alternative for owls; (7) Management should not be allowed in Type A habitat, there should be no salvage logging in NRF areas, prohibition of harvest of habitat during the breeding season within NRF areas would reduce impact to owls; (8) There should be no harvest of historical sites because of metapopulation dynamics; (9) Habitat restoration should not be used as mitigation; (10) How will riparian management zones in OESF areas serve as NRF habitat; how much of RMZs will serve as functional spotted owl habitat; and, (11) a proper analysis of projected management of Forest Service matrix lands in the White Salmon area would reveal that less protection is required for the issuance of an ITP.

Regarding the OESF, one commentor was concerned that the HCP document discussed ecosystem management but stated that spotted owls do not direct that management. The commentor disagrees with that approach and thinks that ecosystem management has little meaning unless ecosystem-level wildlife concerns are addressed and met. This commentor was especially concerned with the degradation of old-growth forest habitat.

Response: The proposed HCP will most likely result in improved habitat conditions within NRF management areas in the five west-side planning units over time as a result of the nest patch approach, the riparian management strategy, and the marbled murrelet strategy. Field data indicates that most of the spotted owl habitat on DNR managed lands in these planning units is Type C habitat. There are currently a total of approximately 35,000 acres of forest lands older than 200 years in the five west-side planning units (DEIS p. 4-19, Table 4.2.3) with 23,700 acres of forest older than 150 years within proposed NRF management areas. There will be a projected 51,000

acres of forests older than 150 years old within NRF management areas by the end of the permit period, with much of that likely in a geographic location and patch size to be useful to spotted owls because of the 50 percent habitat requirement within WAUs and the configuration of nest patches. If the research phase results in a different strategy for providing nesting structure in the landscape, then it is likely that forest stands whose primary cohort is younger than 150 years old would serve as habitat that supports nesting spotted owls. In addition, the overall amount of suitable spotted owl habitat will be greater in Alternative B (the proposed HCP) than the No Action alternative in the five west-side planning units (DEIS, p. 4-45). In the three east side planning units, the overall amount of NRF habitat that will be developed and maintained on DNR-managed lands would be less under the proposed HCP than under the No Action alternative. The strategy in the HCP, however, is to maximize DNR's contribution to the owl population as supported by federal reserves. There are 19 WAUs in which the amount of habitat will increase from current levels in order to reach a 50 percent level in designated NRF areas. The strategy in eastern Washington is consistent with both the proposed 4(d) rule and the recently adopted state permanent Spotted Owl Rule.

The Services do believe that less protection for NRF habitat would be unacceptable for issuance of an ITP.

The landscape assessment process is not described in detail in the HCP. The HCP document does not in general contain the details for implementation of the plan. The HCP does specify that a landscape assessment process will take place in each WAU in which harvest activity is planned and that the goal of such assessments is to ensure that the amount and quality of spotted owl habitat has been accurately determined in the field and that spotted owl ecology has been taken into account when planning where to place timber sale units. The amount of time required for an assessment will depend on the size of designated NRF areas in the particular WAU in which harvest is intended, but should not take more than one field season to complete.

DNR designated NRF areas (under Alternative B) are at present in a variety of spotted owl habitat conditions. According to existing habitat data, there are 54 WAUs in which NRF areas are below the habitat target. However, of the total 101,000 acres that will be maintained in NRF habitat under the proposed HCP, there is presently a total deficit of 14,100 acres - approximately 3,200 acres in 19 WAUs in the three east side planning units and 10,900 acres in 35 WAUs in the five west-side planning units. Given that the deficit of habitat is spread among a relatively large number of WAUs, there are no large areas that are without habitat. Those areas that are currently

not in a habitat condition were designated because of the importance of their geographic location for long-term owl conservation. The Service thinks that the proposed strategy of allowing harvest of habitat outside of designated NRF areas in exchange for the maintenance of existing habitat and development of new habitat within designated NRF areas will not place the owl population at a greater risk of extinction than under the No Action alternative.

There is ample evidence to demonstrate that spotted owls disperse to unoccupied habitat. This is the basic mechanism of population dynamics in a territorial population. In addition, owls occur in landscapes that have been subject to disturbance, i.e. forests which have not always been habitat. Thus, it is not presumptuous, but a well-grounded ecological concept that if a forest develops structural attributes required by spotted owls, and if this forest occurs within dispersal distances of reproductive owl pairs, then it is likely it will be used by spotted owls.

The Service and DNR think that the proportion of sub-mature habitat and high quality nesting habitat for NRF areas in the five west-side planning units is adequate. Approximately 20,400 acres of high quality nesting habitat will be arranged as 300 contiguous acres surrounded by an additional 200 contiguous acres of habitat that is sub-mature quality or better. These nest patches will total 12.5 percent of the designated NRF areas in high quality nest habitat and will be embedded in a larger landscape of habitat that is sub-mature quality or better. In conjunction with the other components of the HCP, namely the riparian, snag and green tree retention, and marbled murrelet strategies, the remaining 38.5 percent of the habitat will eventually be mix of habitat that is both sub-mature and higher quality. Forest growth and harvest modeling done for Alternative B projects that 51,000 acres of forest will be older than 150 years by the end of the 100 plan period (DEIS p. 4-39), which amounts to 31 percent of the NRF areas and approximately 62 percent of the spotted owl habitat to be maintained in NRF areas in the five west-side planning units. This amount is higher than the 30 percent suggested by the commentor, and represents more forest older than 150 years than the 23,700 acres that currently exists in NRF areas designated under Alternative B.

For response to issues surrounding southwest Washington, see category heading NRF Distribution in this section.

The amount of replacement habitat within NRF areas will not replace all the habitat that could eventually be harvested outside of NRF areas under Alternative B. Mitigation for habitat harvested outside NRF

areas is to maintain and develop habitat in areas thought to most efficiently support the spotted owl population. The overall HCP in the five west-side planning units will provide more forests that could potentially serve as spotted owl habitat outside of NRF areas than occurs at present (DEIS p. 4-39). These forests (forests older than 70 years old) however, would not be managed specifically for spotted owls, thus the DEIS did not count these forests as making a definite habitat contribution.

DNR and the Services disagree with the commentator who stated that Chapter 2 of the DEIS portrays Alternative A as providing more spotted owl habitat than Alternative B. The long term consequences of implementing current spotted owl management policy are consistently portrayed in Section 2 and Section 4 of the DEIS as leading to loss and degradation of habitat over time. Matrix 2a (p.2-63) does state that the No Action Alternative could potentially result in 16 percent of DNR lands outside the OESF in fully functional forest as compared to 12 percent under Alternative B. There are major differences between these alternatives for spotted owls, however. First, as is described in the analysis of impacts of the alternatives to spotted owls, continued implementation of spotted owl circle management will lead to smaller habitat patches and a loss of habitat over time as circles move or become decertified. This aspect of Alternative A was not modeled, thus the results described in Matrix 2a and in Chapter 4 of the DEIS (p. 4-472) overestimate the amount of fully functional forest that will be retained as a result of regulatory protection of spotted owl circles under Alternative A. For spotted owls, the habitat that would be provided under Alternative B would be in geographic locations and spatial configurations useful to owls on a landscape level, and maintenance of projected levels guaranteed. Second, there is great uncertainty involved in projecting present day forest management policies for 100 years under the No Action Alternative. While an HCP does not completely eliminate uncertainty, it does allow projection under the terms of the legal contract that would bind both DNR and the Services to a known level of species and habitat protection for the duration of the agreement. Thus, it is quite speculative to say that DNR-managed lands will be covered by 16 percent fully functional forest in 100 years under Alternative A.

The idea to allow management of Type A spotted owl habitat within NRF areas was originally put forth as one of two options by the HCP Science Team (DNR 1995e). This option has a recognized higher risk level than the option that would preclude management within Type A habitat. In exchange for allowing such management to occur, DNR committed to establishing nest patches in the five west-side planning units to retain existing nest structure in the landscape and to doing

research on spotted owl nesting ecology in managed landscapes. This provision was thought by the Science Team to not pose large risks to owls in eastern Washington due to the presence of nesting owls in sub-mature habitat types. The Service accepts this approach.

The inclusion of a salvage logging provision in the spotted owl strategy is driven by state law (RCW 79.01.795 and RCW 76.06.040). The Service will be included in discussions of any salvage activities that may be required under these statutes. If they determine that such activities would have an adverse affect on the conservation strategies, DNR and the Service will work together to find sufficient mitigation to allow the activities to proceed (see draft HCP p. IV.11 and p. IV.21).

In order to reduce potential impacts to nesting spotted owls within NRF areas, the Services or its designee will conduct surveys within WAUs in which the amount of suitable habitat has exceeded the target levels in order to update information on spotted owl site locations. These surveys will be conducted in such WAUs every three to five years. DNR will use this information to plan harvest activities farther than 0.7 mile from the site center during the breeding season. The text of the HCP has been changed to reflect this commitment.

The HCP spotted owl conservation strategy recognizes the importance of metapopulation dynamics. The NRF area approach represents a shift from regulatory owl circle by owl circle management, which results in habitat fragmentation and decreasing levels of habitat over time, to landscape level management. In this approach, a constant level of habitat will be maintained and current or historical site occupancy does not drive timber harvest decisions (except to avoid harvesting nest sites). Under Alternative A (No Action), however, decertification surveys are part of the strategy to reduce the amount of forest land that is not available for harvest due to the 40 percent habitat threshold within owl circles. Three successive years of no occupancy can result in a circle attaining a "historical status" and thus releasing that habitat for harvest. This possibility is precisely why the No Action Alternative can result in long term loss of spotted owl habitat on DNR trust lands and is precisely why DNR is proposing to move to landscape-level management of spotted owl habitat. Dispersing juvenile owls are easily capable of movements that traverse the distances necessary to accomplish this (see DEIS p. 4-310). Current thought is that the Olympic Peninsula subpopulation is large enough that it is likely to be self-sustaining (see Holthausen et al. 1994, or the brief review in DEIS p. 4-313 and 314). Historic owl sites (most of which are unoccupied because, currently, habitat conditions are inadequate to support owls, DEIS p. 4-326 through

327) are likely to play little or no role in the near- or long-term support of that subpopulation without habitat restoration. The OESF conservation strategy for the spotted owl intends to support the geographic and ecological distribution of the Olympic Peninsula subpopulation by maintaining or restoring landscape conditions that support owl pairs over a significant portion of their potential range (see DEIS p. 4-330 to 331, 4-334 to 335, 4-341, and 4-347).

DNR and the Service disagree that habitat restoration should not be used as mitigation for incidental take. Commitment to habitat restoration is the primary tool by which the Service can secure agreements from proponents to develop and maintain habitat in areas that are important to the spotted owl population but currently are in a poor habitat condition. Habitat restoration in the context of the HCP strategy for the OESF means developing forest stands and landscapes that support successfully reproducing spotted owls that are a functional segment of the Olympic Peninsula subpopulation (draft HCP p. IV.75). Spotted owls are known to successfully re-colonize forests that regenerated either after natural disturbances or logging (see Horton 1996 for a review of spotted owl ecology in the context of managed forests). It is widely thought that spotted owl populations can respond favorably to habitat restoration (e.g., USDI 1992, USDA and USDI 1994a, b). The *status quo* in the OESF area is currently not adequate to support successfully reproducing spotted owls that are a functional segment of the Olympic Peninsula subpopulation (DEIS p. 4-333, 4-338 to 339; and the draft HCP p. IV.77 and IV.78), thus habitat restoration is necessary to meet the mission of the OESF (see draft HCP p. IV.69 through 75). This habitat restoration meets the definition of mitigation (see draft HCP, Glossary, p. 9).

Of all DNR-managed lands that provide habitat for spotted owls, DNR's proposed level of incidental take of spotted owls is highest in the White Salmon area. The strategy for this area was to establish NRF management areas within 1.8 miles of federal reserves and in key areas directly south of the Yakama Indian Reservation. There are several spotted owl site centers on or within 1.8 miles of DNR-managed lands for which DNR would no longer provide support precisely because of the location of federal matrix lands and or the lack of federal lands at all. DNR and the Service do not think it is acceptable to provide less protection in this area than is already proposed.

It is hypothesized that streamside forests provide particularly important habitat for spotted owls (Carey et al. 1992, Carey and Johnson 1995). Streamside and unstable hillslope areas in the OESF that will be managed under the proposals of the riparian conservation strategy will have the potential to function as nesting, roosting, and

foraging habitat for spotted owls when the following conditions are met: 1) the structure and composition of forest stands in those areas are similar to those described as old-forest habitat by Hanson et al. (1993), and 2) either the sizes of older streamside or hillslope stands are sufficiently large that interior forest (greater than 50 m from an abrupt edge) comprises an appreciable proportion of those stands or those older streamside or hillslope stands are embedded in upland stands that are similar to those described as young- or old-forest habitat by Hanson et al. (1993). Streamside and hillslope stands with structure and composition similar to those described as young-forest habitat by Hanson et al. (1993), and also meet criterion 2 above will have the potential to function as foraging and roosting habitat for owls.

Currently, only 28 percent of streamside forest stands and an unknown proportion of stands on unstable hillslopes are older than 50 years (draft HCP p. IV.121-122). An unknown proportion of those also meet criterion 2 above and currently have the potential to function as young- or old-forest owl habitat. If the HCP proposal is implemented in the OESF, it is hypothesized that most streamside and unstable hillslope areas (approximately 1/3 of the land base in the OESF) would attain stand-level characteristics of owl habitat because of management to maintain and restore riparian functions (draft HCP p. IV.121). However, not all such stands will have the potential to function as owl habitat because some will be too small or narrow to function alone, and will be periodically embedded in young forests that are not potential habitat.

The distribution of potential habitat in streamside and unstable hillslope areas will vary across landscape planning units with some steep, unstable drainages such as many in the Willy-Huel and Clearwater landscapes (see draft HCP p. IV.78 through 85) having much more of their area managed for riparian conservation (draft HCP p. IV.121) and thus, more potential habitat regardless of the characteristics of the surrounding uplands. Three independent, preliminary efforts modeling forest growth and harvest in the OESF projected that young- and old-forest habitat will comprise approximately one-half of the uplands (draft HCP p. IV.79 through 85, DEIS p. 4-340, and DEIS, Appendix D p.2). If both streamside and unstable areas, and habitat in the uplands were distributed evenly across the OESF then half of the areas managed for riparian conservation would be embedded in habitat in the uplands and eventually have the potential to function as owl habitat. However, because of the large streamside and unstable hillslope areas in several landscapes, it may be that as much as two-thirds of the total area managed for riparian conservation in the OESF may ultimately have the potential to function as owl habitat.

The draft HCP (p. IV.74 and 75) states that the forest ecosystem values of stand-level function for dispersal, foraging, roosting, and nesting habitat for spotted owls, and landscape-level functions that include supporting successfully reproducing owls that are a functional segment of the Olympic Peninsula subpopulation are explicit objectives of the OESF conservation strategy. The portion of the comment regarding degradation of old-forest habitat will be addressed in the response to the following series of comments.

NRF-designated areas

Summary: WDFW, the Point No Point Treaty Council, Northwest Forestry Association, Society for Conservation Biology, and two individuals commented on NRF designated areas. WDFW had several suggestions for corrections in the maps of NRF areas presented in the DEIS as well as for additions to proposed NRF areas. Other comments include a recommendation to not remove NRF areas if federal reserves become sufficient to support spotted owls on their own at some point in the future because other late successional species depend on owl habitat; areas excluded due to elevation should be evaluated on a case-by-case basis to determine whether or not the area is capable of supporting the growth of spotted owl habitat; the average range of a female spotted owl is 15 miles so NRF areas should extend 15 miles from federal reserves instead of 2 miles; small parcels of DNR lands that are designated as NRF areas are not likely to make a significant contribution to demographic support and thus should no longer be designated in exchange for a higher habitat requirement in an adjacent WAU that contains larger parcels; NAPs and NRCAs should not count toward the 50 percent habitat goal because they are not legally part of the HCP and the legislature could change the way these lands are managed so they no longer contribute NRF habitat; and the Siouxon area should be excluded from NRF designation because adjacent federal lands will adequately support owls in this area.

Response: DNR and the Service reviewed comments and questions from WDFW regarding potential errors or omissions in NRF area designations. The resulting changes are shown in the map section of this FEIS. In the North Puget Planning Unit, no changes were made to actual designations. However, the map has been clarified to show which NRCAs and NAPs are also designated NRF areas and which ones, though not designated NRF areas, will be providing nesting, roosting, and foraging habitat by virtue of their current habitat condition and location. The Greider Ridge NRCA in the Spada Lake basin is one such

non-NRF designated NRCA that will provide suitable habitat. This NRCA was not designated as an NRF management area because it currently has no overlapping owl circles and it is further than 2 miles from a federal reserve. Portions of the Morning Star NRCA which are adjacent to a federal reserve were not designated as a NRF area because of high elevation, non-habitat conditions.

In the South Puget Planning Unit, a small parcel directly north of the Mineral Block was shown as having no spotted owl role. This was a mapping error and has been corrected to show that it is a designated NRF area. There are two sections near the end of Highway 706 that are designated for a dispersal function. WDFW asked if these were intended for a NRF function because of the proximity to federal reserves. These parcels occur in an area recommended by the Spotted Owl Recovery Team to serve a dispersal function and will thus retain that designation.

In the Columbia Planning Unit, WDFW pointed out a section south of Mount St. Helens that is adjacent to a federal reserve. The HCP Science Team did not designate this parcel for a NRF function because it currently has no habitat and is not within an owl circle, thus they did not think it was an efficient use of DNR land for spotted owl conservation. The "no role" designation will be retained.

In the Yakima Planning Unit, the dispersal areas directly to the south of federal reserves and north of the Yakama Indian Reservation (south of Highway 12) were not designated for a demographic support function because ecological conditions (a combination of elevation and soil type) of these lands do not support spotted owl habitat. The dispersal designation is retained.

In the Klickitat Planning Unit, six sections directly adjacent to Forest Service matrix land in the White Salmon area (T05N R10E, sections 34, 33, 28, 27, 22, and 21) have been changed from dispersal management to NRF management to provide more support for existing site centers. These sections were redesignated in exchange for changing six sections in T07N R12E of NRF management area to dispersal management. The parcels changed to dispersal management areas are peripheral to nearby site centers. This change results in three fewer site centers being at risk for incidental take than was originally assessed in the DEIS for Alternative B. It was also thought that DNR-managed lands would be more efficiently used by supporting four of the site centers in the cluster that spans both

federal and nonfederal lands within the boundaries of the SOSEA under the new state spotted owl rule. Habitat contributions from private land owners in the area are also possible because of the provisions of the new rule.

The draft HCP includes language that allows the Board of Natural Resources the option to approach the Service with a proposed amendment to remove NRF designations if sufficient data exists at some point in the future to indicate that federal reserves are sufficient to support the spotted owl population. Any such proposal would be considered by a multi-agency Science Team that will be convened to make recommendations on any biological amendments to the HCP. Multi-species issues would be taken into account in any decision.

An elevational screen has commonly been used when considering potential spotted owl habitat (Stearns 1991). DNR believes the use of such a screen is appropriate for its HCP.

There is no data to support the contention of the commentor who stated that the average home range radius of a female spotted owl is 15 miles. A home range with this radius would encompass 452,390 acres which is an order of magnitude larger than the largest home range sizes reported in Hanson et al. (1993). This data is based on the use of the minimum convex polygon method. Other methods of home range estimation such as the 60 percent adaptive kernel technique often produce smaller home range sizes. Hanson et al. (1993) determined that the radius of a median annual home range for spotted owl pairs is 2.7 miles in the Western Washington Lowlands and Olympic Peninsula Provinces, 2.0 miles in the Western Washington Cascades Province and 1.8 miles in the Eastern Washington Cascades Province. The Service will evaluate any new data that suggests that basing owl conservation strategies on these radii would result in jeopardizing the species and take appropriate action under the extraordinary and unforeseen circumstances clauses of the implementation agreement.

The proposal to de-designate small parcels of NRF areas in exchange for higher levels of habitat in adjacent WAUs is an interesting idea. However, in some planning units, the Yakima and Chelan in particular, there are very few options for designating NRF areas other than the small parcels that exist. In other areas where this option may exist, DNR and the Service think that it will be more beneficial at this time to have more forested area in a 50 percent habitat condition as opposed to fewer areas in a 60 percent habitat condition. This is because

data is lacking on the distinction in habitat quality between a 50 and 60 percent level, so the trade-off may not be that beneficial to owls. In addition, in areas where small parcels occur in SOSEAs designated under the newly adopted State Spotted Owl Rule, the opportunity exists for adjacent private landowners to manage spotted owl habitat using a landscape approach rather than a spotted owl circle approach. Thus, DNR's habitat contribution could be complimented by other nonfederal lands increasing the value of the contribution.

The location and habitat condition of a small number of NRCAs and NAPs make them valuable to the HCP spotted owl conservation strategy. The Service does recognize that management plans for these areas could change by legislative action. Thus, the HCP requires that sufficient mitigation be found for the loss of habitat contribution should these particular NRCAs and NAPs be de-designated or their management change such that older forest that currently exists there be degraded or harvested as a result of legislative action.

DNR-managed lands along with other nonfederal lands in the Siouxon area will remain important to the spotted owl population in Washington regardless of the habitat condition on federal reserve lands. This is due to the fact that they lie farther to the west than federal lands, thus contributing to the maintenance of species distribution and serving as a potential demographic link between Oregon and Washington populations, and to the fact that they contain low elevation habitat which is uncommon on federal lands (USDI 1992b). The Washington Forest Practices Board Spotted Owl Science Advisory Group (SAG), also considers habitat in the Siouxon as essential to the spotted owl population in Washington (Hanson et al. 1993).

quality/definition

Summary: WDFW, The NWIFC, the Point No Point Treaty Council, National Audubon Society, Sierra Club, NCASI, Washington Wilderness Coalition, WEC, Northwest Ecosystem Alliance, two local chapters of the Audubon Society, and 55 individuals (an identical letter sent by 51 different individuals) made comments relating to spotted owl nesting, roosting, and foraging habitat definitions. Most comments generally conveyed the opinion that higher quality habitat than that defined as sub-mature in the HCP should be provided in NRF areas. Six commentors wanted the down woody debris component in sub-mature habitat increased from 5 percent ground cover to 15 to 20 percent ground cover. One commentor felt that it was inappropriate to include sub-mature habitat as NRF unless it

contained significant structural legacies of snags, large trees, and down woody debris. This commentor also requested that DNR establish minimum standards for numbers of large trees, snags and down woody debris to qualify sub-mature habitat as NRF. Another commentor felt that the provisions for snags and down woody debris in sub-mature habitat were in general below a safe level. One commentor wrote that the GIS habitat analysis in the EIS which included some 60 year old forest as owl habitat constituted a statistical "sleight of hand" and that 70 percent canopy closure was inadequate. Fifty-one commentors (same form letter from 51 separate individuals) wrote there were not enough snags, large trees and down wood in the nesting habitat definition.

Regarding the OESF, one commentor wrote that the strategy of allowing some high quality old forest to be degraded in exchange for commitment of habitat that was of uncertain value was too risky for owls in that planning unit. This commentor felt that experimentation in old growth was reasonable, but should proceed more cautiously and allow DNR the flexibility to conclude that more old growth was required than what is currently being proposed for the OESF.

Other comments and questions included how, in the absence of surveys, will DNR determine if sub-mature habitat is actually being used by spotted owls in the manner in which the HCP strategy intends; there should be Tribal input on the development of new habitat definitions after the research phase; replacement habitat should develop naturally; the HCP should acknowledge that scientists have a relatively crude understanding of what constitutes suitable spotted owl habitat; and, that because little is understood about survival strategies of spotted owls in eastern Washington habitat types, there should not be more manipulation allowed than in western Washington.

Response: In the five west-side planning units, the combined overall provisions of the HCP will result in NRF management areas that have a mix of sub-mature and higher quality spotted owl habitat. The overall quality of habitat in NRF areas will be higher at the end of the permit period than when the HCP would go into effect. Approximately 20,400 acres of high quality nesting habitat will be arranged as 300 contiguous acres surrounded by an additional 200 contiguous acres of habitat that is sub-mature quality or better. These nest patches will total 12.5 percent of the designated NRF areas in high quality nest habitat and will be embedded in a larger landscape of habitat that is sub-mature quality or better. In conjunction with the other

components of the HCP, namely the riparian (including protection of unstable slopes), leave tree, and marbled murrelet strategies, the remaining 38.5 percent of the habitat will eventually be a mix of habitat that is at minimum sub-mature quality, but will likely have more large trees and snags. Forest growth and harvest modeling done for Alternative B projects that 51,000 acres of forest within NRF areas will be older than 150 years by the end of the 100 year plan period (DEIS p. 4-39), which amounts to 31 percent of the NRF areas and approximately 62 percent of the spotted owl habitat to be maintained in NRF areas in the five west-side planning units. This amount represents more forest older than 150 years than the 23,700 acres that currently exists in NRF areas designated under Alternative B.

A clarification of the definition of NRF habitat used in the HCP for the five west-side planning units has been inserted into the text of the document that is analyzed as part of this FEIS. The definition reads “ For the purposes of this HCP, NRF habitat refers to habitat that is primarily roosting/foraging habitat with sufficient amounts of nesting structure interspersed such that the entire area can be successfully utilized by reproducing owls”. Spotted owls nest in sub-mature habitat in eastern Washington. The strategy for provision of NRF habitat during the research phase is to retain two 500 acre nest patches (300 acre patches of the highest quality nesting habitat available plus 200 acre sub-mature buffers) per the most contiguous 5,000 acres of designated NRF areas possible. Additional nesting structure will most likely be retained in occupied marbled murrelet habitat, steep and unstable slopes and riparian areas, as was explained above. This approach essentially recognizes that not every acre of NRF habitat used by spotted owls would be capable of allowing the establishment of a nest site. Outside of the nest patches, the landscape will be at least sub-mature habitat which the SAG determined to provide all the characteristics that owls need for roosting and foraging (Hanson et al. 1993). This habitat type corresponds to the high end Type C habitat from the former DNR habitat classification system. The goal of the research phase is to determine what constitutes adequate amounts and distribution of nesting structure for spotted owls in managed landscapes in western Washington. The results of this research will be implemented if this HCP is approved.

DNR chose a minimum of 5 percent down-woody debris for inclusion in its definition of sub-mature habitat for the following reasons. First, it is minimum and can be increased if research shows that more is required. Second, Carey and Johnson’s

(1995) study demonstrated that on the Olympic Peninsula, populations of small mammal communities reach higher levels in unmanaged stands with abundant down woody debris versus managed stands with lower amounts of down woody debris. The study did not examine optimum population levels of small mammals vis a vis spotted owl foraging use of those areas. While spotted owls do prey on ground-dwelling small mammals, flying squirrels are their primary prey species. Snags are the structural feature that best predict the presence of flying squirrels (Carey 1995). In addition, their work is from the Olympic Peninsula, which is not representative of forested areas in the western Washington Cascades. Third, as Carey and Johnson (1995) pointed out, managed stands do not contain high percentages of down woody debris cover. From an initial analysis of DNR's forest inventory data, down woody debris is apparently a limiting factor for spotted owl habitat on DNR-managed lands at the present time. Management of NRF areas under the HCP will move forest stands toward higher levels of down woody debris with 5 percent as a minimum target level. In the meantime, it will conduct research and use any new data generated by other researchers on what constitutes adequate amounts of down woody debris for spotted owl prey populations in managed landscapes. Carey and Johnson's (1995) data is not definitive on this topic. Fourth, inclusion of a down wood component goes beyond the original definition of sub-mature habitat (Hanson et al. 1993). Their definition assumed that the snag component would eventually contribute to a down wood component. Thus DNR's approach will require down wood in addition to what may eventually accumulate from the retention of snags and leave trees.

DNR and the Services disagree that the nest habitat definition has too few large trees and snags. The high quality nest habitat definition is derived from the only two studies of vegetation characteristics around spotted owl nest sites in Washington state that are currently available (draft HCP p.IV.12 to 16). The number of snags and large trees is higher than any currently used definition of NRF habitat in the state and is characteristic of unmanaged old-growth forests. An initial examination of DNR forest inventory data indicates that a very small percentage of DNR-managed forest lands contain all the characteristics described in the high quality nesting habitat definition.

The methodology used for assembling the multiple data source spotted owl habitat map is explained in the DEIS (p. 4 through 16). The fact that field typed habitat data most closely matched 60 year old stands in some planning units reflects one or a

combination of factors. The field typed data was primarily low quality Type C habitat thus giving a low standard of comparison. Second, those stands could have contained enough residual structure to qualify as Type C or better habitat. Third, the original inventory data that classified age class of the primary species in the stand could be in error. As was discussed in the DEIS, the quality of existing habitat data is less than optimal, which is why the Interdisciplinary Team decided to use two methods of estimating the amount of habitat. It is acknowledged in the DEIS that the amount of habitat estimated by the multiple data source method probably represents an overestimate (p. 4-14 to 18).

The HCP Science Team and the Spotted Owl Science Advisory Group (Hanson et al. 1993) think that 70 percent canopy closure is an adequate minimum standard, based on the literature. Many mature stands will exceed this level of canopy closure.

The HCP monitoring program will include examining the ability of sub-mature habitat to support spotted owl prey populations, and expanding current understanding of the role of various habitat components in providing roosting and foraging functions. The validation monitoring that will occur primarily in the OESF will study spotted owl use of various habitat types including sub-mature habitat. Additional research on spotted owl habitat will be conducted in eastern Washington as appropriate.

The HCP strategy is cautious regarding manipulation of sub-mature habitat in eastern Washington (see draft HCP p.IV.19 and 20). Given that spotted owls nest in landscapes that have been disturbed by fire and past timber harvest, the Services think that this approach is acceptable.

DNR and the Services disagree that habitat restoration should proceed without management intervention. In many instances, thinning and other silvicultural techniques will accelerate the development of habitat structures (USDI 1992b; USDA and USDI 1994b; Carey and Johnson 1995). The precise techniques to be used and a better understanding of the structure, composition and function of spotted owl habitat in managed landscapes are the subject of much of the research and monitoring that are proposed as part of the HCP.

If signed, the HCP is a contract between DNR and the Services. The Services have the ability to designate other parties to assist in overseeing the implementation of the agreement, including

seeking tribal input into the development of nesting habitat definitions upon completion of the research phase.

The conservation strategy for the OESF proposes to achieve three objectives that are functional responses to forest stand and landscape conditions, i.e., responses of individual spotted owls as well as of the Olympic Peninsula subpopulation at-large (draft HCP p. IV.74 and 75). The working hypotheses that is the basis for the management approach proposed in the draft HCP (p. IV.75 through 88) sets a threshold level for old-forest habitat, as defined by Hanson et al. (1993), of at least 20 percent of each landscape planning unit. Their definition was adopted from that of Thomas et al. (1990) who described structure, composition, and function of this habitat-type. Functionally, it is the cover type that the majority of radio-tagged owls showed significant selection for. They also described structure and composition of the habitat-type. The HCP does not propose to replace functional old-forest habitat with habitat of "uncertain value" as part of the 20 percent per landscape planning unit threshold. With our current knowledge, only forest stands with structure and composition consistent with definitions of old-forest habitat could be used to "replace" current old-forest habitat, and then only if landscape-level abundance was above the threshold level. Spotted owls respond to forest structure, composition, and function - not to degrees of naturalness. Structurally diverse forests with abundant large live trees, snags, and logs are likely to have the potential to be good owl habitat whether they regenerated after natural disturbances or logging.

amounts

Summary: The Yakama Indian Nation, National Audubon Society, Sierra Club, Society for Conservation Biology, the Mountaineers; a local chapter of the Audubon Society, 53 individuals (51 copies of the same form letter) and Bogle & Gates (a consultant to Washington State University) submitted comments regarding amounts of habitat within NRF management areas. These comments were as follows: the target for NRF areas should be 75 percent instead of 50 percent; the target should be 80 percent instead of 50 percent; the target should be 60 percent not 50 percent; why increase the habitat amount to 50 percent when 40 percent has been proven adequate; more nesting habitat should be provided; there should be 60 percent habitat within 0.7 mile of a nest; the HCP would provide too much marginal habitat; there is not enough nesting habitat; NRF habitat should be comprised of no more than 20 percent sub-mature quality habitat and the remaining 80 percent should be higher quality such as Type A and Type B habitat; and

federal estimates of habitat on federal lands vary over time, this inconsistency could have a negative financial impact on DNR-managed lands, thus the strategy should be reconsidered.

Response: The rationale for providing 50 percent suitable spotted owl habitat in NRF management areas on a WAU scale is described in DNR's draft HCP (p.IV.25 and 26). While 60 percent habitat might provide a higher level of demographic support than 50 percent, the absence of a statistically significant difference in owl density or reproductive success between 50 and 60 percent habitat coverage (Bart and Forsman 1992) led DNR to propose the lower level as a compromise position between meeting the biological requirements of the Endangered Species Act and the requirement to produce the most substantial support to the trusts possible. Providing 40 percent habitat at a landscape level has not been proven sufficient, and could lead to less than adequate amounts of habitat at a territory scale (Bart 1995). The Service thinks that the proposed strategy is acceptable to meet Section 10 criteria.

Retaining 60 percent habitat within 0.7 mile of nest sites may constitute a lower risk conservation strategy for spotted owls than that in the proposed alternative. Data originally analyzed in the Interagency Scientific Committee's Conservation Strategy for the Northern Spotted Owl (Thomas et al. 1990) and reanalyzed by Bart (1995) indicates that owls are more likely to occupy sites with greater than h acres of habitat within 0.7 mile of the site center than with less than h acres with h ranging from 200 to 800 acres. While this data indicates that habitat near the nest site is important, it does not indicate how much suitable habitat owls need around their nests. Data analyzed in the FEIS for the Washington State Forest Practices Board Spotted Owl Rule indicates that the majority of sites with reproductive output that would support a stable or increasing population have more than 500 acres of (approximately 50 percent) habitat within a 0.7 mile core versus less than 500 acres (WFPB 1996a p.2-112). However, a large number of sites with low reproductive output also had more than 500 acres within a 0.7 mile core (WFPB 1996a pp.2-101, 2-103, 2-107, 2-109). Again, data on the correlation of amount of suitable habitat around nest cores and reproductive output indicates that habitat amount is important near the nest, but no threshold is evident. The HCP Science Team thought that maintaining an overall landscape condition of 50 percent habitat and establishing nest cores with 500 acres suitable habitat (300 acres nesting habitat, 200 acres of sub-mature habitat or better) was adequate protection. Further, the draft HCP has been modified such that DNR is committing to

harvest habitat away from known site centers in WAUs that have habitat above the target level. This provision will result in the retention of all existing habitat within a 0.7 mile core of known sites within NRF areas. In addition, the draft HCP has been modified to incorporate a take schedule of sites outside of NRF areas to allow important sites to be retained for the first decade of the HCP. Sites with high reproductive output will be prioritized for take avoidance.

DNR-managed lands in NRF areas are currently dominated by forests that are sub-mature habitat or lesser quality, with smaller amounts of older forest (DEIS Figure 4.2.5 and 4.2.8, p. 4-35 and 4-37). The proposed HCP will result in an overall improvement of habitat conditions within NRF areas (see response under *Nesting, roosting, foraging habitat - quality, definitions* above).

Federal habitat estimates vary as better information becomes available. DNR does not think that the use of the best available habitat data constitutes a financial impact to DNR or a reason to reconsider the proposed strategy. Linking the target amount of habitat in DNR NRF areas to adjacent federal reserves is a sound landscape strategy that allows DNR to complement the President's Northwest Forest Plan and provides relief from incidental take prohibitions in other areas.

distribution

Summary: WDFW, Muckleshoot Indian Tribe, Yakama Indian Nation, NWIFC, NCASI, Society for Conservation Biology, Sierra Club, the Mountaineers, Northwest Ecosystem Alliance, 53 individuals (51 copies of the same form letter), and Bogle & Gates (a consultant to Washington State University) commented on the distribution of NRF habitat and NRF areas.

Comments are as follows: The DEIS notes that declining habitat is a severe threat in the southern portion of Western Washington Cascades Province yet little NRF habitat will be protected on DNR-managed lands - this appears to be a discrepancy and needs to be clarified; establish 4 mile radius experimental areas around all known sites in southwest Washington to maintain distribution of owls in Washington state and allow some economic return; lack of provisions for spotted owls in southwest Washington is contrary to recommendations in the Recovery Plan, thus DNR should add NRF areas here; DNR should analyze an alternative that supports clusters that are further than a median home range radius from federal reserves; add NRF areas to southwest Washington and the rest of the Western Washington Lowlands

Province for HCP; protection of NRF habitat in southwest Washington is needed for linkage to Oregon Coast Range; in the east side planning units, extend NRF areas to within at least 5 miles of federal reserves and Yakama Indian Reservation; DNR could reduce the edge-to-area ratio in a portion of the Columbia Planning Unit by including lands north of Interstate 2 and west of Mount St. Helens in a NRF area and in the North Puget Planning Unit by changing the dispersal designations north of Route 20 to NRF areas; provide NRF area(s) in the Sultan Basin to provide a solid, low elevation connection between federal lands to the north and south; why are there no NRF areas in the Straits Planning Unit; NRF areas would be better used if they added demographic support to small clusters instead of ones that already consist of 20-25 pairs; and the WAU approach which requires that DNR lands contribute at least 50 percent habitat on its lands regardless of the condition of federal reserves unfairly burdens DNR. One commentor wanted to know how the 5,000 acre blocks in which nest habitat patches are to be located are going to be determined.

Response: DNR and the Services disagree with the commentor who stated that little habitat is protected on DNR-managed lands in the southern portion of the Western Washington Cascades Province. The Northern Spotted Owl Recovery Team (USDI 1992b) divided the Western Washington Cascades Province into northern and southern sections roughly at Mount Rainier. DNR has designated large blocks of its managed lands in the Siouxon and Columbia Gorge areas as NRF management areas, following the recommendations of the Recovery Team. In fact, the proportion of existing habitat protected on DNR-managed lands is the highest of any other province. Approximately 73 percent of the habitat on DNR lands within 6 miles of federal reserves in the Columbia Planning Unit are within NRF areas. The next highest proportion of habitat on DNR-managed lands that falls within NRF areas is 67 percent in the Chelan Planning Unit.

The situation with regard to owls in Southwest Washington is complicated, and is directly related to the physical and biological features of that area. This area is relatively accessible with a climate and soils well-suited to growing trees. It has been intensively harvested beginning early in Washington's history. Many portions of this area have already been harvested three or more times. Old-growth forest is conspicuously absent, and the landscape is dominated by younger plantations (e.g., <45 years old). Yet, in spite of the low densities of what we normally consider to be suitable owl habitat, a number of owls (including two breeding pairs) have persisted. This may be related to the

inherent productivity of this area. Southwest Washington (south of Highway 8 and west of Interstate 5) contains only negligible amounts of Ederal lands.

The proposed 4(d) special rule also plays an important role in development of this HCP. Because HCPs are developed through a negotiated process, it is difficult for the Service to extract mitigation in excess of what a land-manager would be required to provide without a permit. The proposed 4(d) rule does not contain any Special Emphasis Area (SEA) in Southwest Washington. An option available to DNR is to not pursue an ITP covering owls in Southwest Washington and merely wait for the 4(d) rule to be completed. The 4(d) special rule, as proposed, would not require land-managers to provide demographic support outside SEAs.

The Service must assess DNR's proposal in several ways; two of the considerations are discussed below. One consideration will be to determine if the lack of demographic support in Southwest Washington, as proposed in DNR's HCP, will significantly reduce the likelihood of survival and recovery of that species in the wild. In conducting that analysis, the Service will not consider the 4(d) special rule proposal. The Section 7 consultation process uses a "first in line, first in right" approach. In other words, because the 4(d) special rule proposal is also a federal action, it will also be evaluated according to Section 7 at the time of that action. Should DNR's HCP be completed prior to the promulgation of the proposed rule, DNR's HCP would be evaluated with the assumption that other lands would continue to be subject to Section 9 prohibitions on take.

Currently there are about 20 owl sites in the Province; 13 of these are in Southwest Washington and the remaining sites are adjacent to the Western Washington Cascades province immediately to the east of this area. All 20 of these sites are at risk of take from the proposed rule. The southern most sites in the Olympic Peninsula Province would also be at risk. Promulgation of the 4(d) rule as proposed, and in the absence of landowner incentives, would place all owl sites between the Mineral Block and the Peninsula at risk and all sites between the Cascades Range and the Coast in Southwest Washington at risk. Of the 13 sites in Southwest Washington, DNR lands contain the site centers and/or significant amounts of habitat for at least half of the sites, including both of the two breeding pairs that occur in Southwest Washington.

Second, another consideration is whether DNR's HCP would minimize and mitigate the effects of the take to the maximum extent practicable. This must be viewed in the overall context of the amount of owls to be taken and the impacts that would result. A relatively small number of sites (13) exist in Southwest Washington. The DNR HCP would likely result in the take of over half of those sites, including both breeding pairs. This would have a major impact on the owl population in the Province. A larger number of owl sites will be taken throughout the remainder of the State but these will represent a smaller percentage of the sites in the other Provinces. The impacts of take to occur Statewide will be assessed relative to the mitigation proposed in DNR's HCP, which includes nesting habitat, foraging and roosting habitat, and dispersal habitats in key locations across the State. The amount of mitigation in Southwest Washington, however, is minor and merely incidental with respect to owls. One factor the Service will consider is the effects at the Province level and how those impacts are addressed by the mitigation which occurs elsewhere in the State.

The Service notes that recommendations of the final draft Recovery Plan will not be met by DNR's proposed HCP. However, there is no requirement for HCPs to be consistent with Recovery Plans. The relationship between Southwest Washington and the Oregon Coast Range was referenced by one commenter. The Service notes that the relationship is unclear at this time with regards to mutual demographic support and exchange between those two areas.

The Service will further analyze the above-addressed factors, as well as other factors, as it considers its responsibilities under Section 7 of the ESA and as it assesses whether the issuance criteria for a Section 10 permit are being met.

The DEIS analyzed two options that do provide protection to spotted owls farther than a median home range radius from federal reserves. Alternative B provides protection for owls in the Siouxon, Columbia Gorge, and White Salmon areas that extend up to 8 miles from federal reserves. Alternative C provides more protection in the White Salmon and farther to the east in the Klickitat Planning Unit. Under Alternative C, 77 percent of the territorial site centers that influence DNR lands would have some portion of their median home range radius circle covered by NRF management areas. Options that provide more protection do not fit the purpose and need of the proposed action and thus were not developed further.

The commentor who recommended that NRF Management Areas be extended to 5 or more miles from federal reserves in the eastern Cascades supported their recommendation with the fact that 80 percent of spotted owls on DNR-managed lands occur on DNR-managed lands within 10 miles of federal reserves. Table 4.3.2 (DEIS, p. 4-186) shows the spatial distribution of spotted owls within a median home range radius of DNR-managed land with respect to federal reserves. Actually, close to 90 percent of spotted owls on DNR-managed lands occur on DNR-managed lands within 10 miles of federal reserves. But, nearly 60 percent of site centers lie within 2 miles of federal reserves. Table 4.3.2 shows that beyond two miles from federal reserves, a law of diminishing returns exists for the conservation of spotted owl site centers. NRF Management Areas designated for DNR-managed lands within 2 miles of federal reserves benefit 60 percent of site centers within a median home range radius of DNR-managed land. Extending NRF Management Areas another two miles from federal reserves would benefit only another 10 percent of site centers within a median home range radius of DNR-managed land. A strategy based on NRF Management Areas extending 4 miles from federal reserves would be a less efficient strategy for the conservation of spotted owls.

One commentor suggested that designation of DNR lands north of Highway 2, west of Mount St. Helens, and north of Highway 20 as NRF habitat would reduce the edge-to-area ratio created by large indentations in the boundaries of federal reserves. DNR-managed lands north of Highway 2 are designated as NRF areas. DNR-managed lands to the west of Mount St. Helens are currently non-habitat and do support spotted owls, thus would not constitute an efficient or useful designation, nor assist in reducing the edge-to area ratio habitat patches in the area for quite some time into the future. All DNR-managed lands north of Highway 20 that are adjacent to federal reserves and thus have the potential to reduce edge-to-area ratio are already designated as NRF areas. Lands that are designated for a dispersal function are too distant from reserves to assist in reducing landscape-level fragmentation.

In response to the commentor who suggested that DNR establish NRF areas in the Sultan Basin to provide north-south linkage in the western Cascades, the proposed strategy does establish NRF management areas in this location. The entire basin is not designated, but most existing habitat and all presently known site centers that are on or overlap the area are included in NRF areas. In addition, the Greider Ridge Natural Resource Conservation

Area, which is not designated as an NRF area but will continue to make a *de facto* habitat contribution as long as it is managed as an NRCA, also occurs in this area. DNR and the Service think that this combination of NRF areas and NRCAs constitutes adequate protection for spotted owls and owl habitat in the Sultan Basin.

By virtue of the location of DNR-managed lands throughout the range of the spotted owl in Washington State, the criteria use to establish designated NRF areas has resulted in areas that support both large clusters and small to medium clusters. Support of small to medium clusters will assist in demographic support of metapopulations that could be prone to extirpation due to lower number of reproducing individuals. Due to current habitat conditions on federal reserves, nonfederal habitat contributions to medium to large clusters is thought to assist the demographic stabilization of clusters that occur in areas with less than optimal habitat conditions (see DEIS p. 4-82 and Lamberson et al. 1994).

DNR and the Service disagree that the WAU approach which commits DNR to maintaining NRF areas at 50 percent habitat level even if adjacent federal reserves exceed 50 percent habitat unfairly burdens DNR lands. This strategy constitutes mitigation for harvest of habitat over a substantial portion of DNR-managed lands with a net gain in acres over which DNR can manage its lands for trust income.

The 5,000 acre groupings of NRF areas for the purposes establishing nest habitat patches will be done by DNR staff biologists during the first year of implementation of the HCP. The process will use GIS and professional judgement to find the most contiguous groupings of NRF areas possible and the optimum distribution of nest patches across the landscape given current habitat conditions and location of known nest sites. DNR will seek professional consultation from the WDFW in this process.

management within

Summary: WDFW, the NWIFC, Northwest Forestry Association, Society for Conservation Biology, two individuals, and Bogle & Gates (a consultant for Washington State University) commented on issues pertaining to management practices within NRF areas. Specific comments are as follows: (1) WDFW suggests that language should be inserted in both the west side and east side sections regarding management of sub-mature habitat which requires DNR to avoid manipulation of habitat near known spotted owl activity centers within

demographic support areas until those sites move; (2) WDFW is interested in discussing participation in a cooperative or some other inexpensive program in which the location of spotted owl activity centers is monitored in each WAU with excess habitat every three to five years; (3) The HCP should discuss the possibility of using nest boxes to enhance the northern flying squirrel population; (4) There should be no logging in areas established for spotted owls; there should be no harvest of any Type A spotted owl habitat nor any salvage logging within NRF areas; (5) The discussions of management activities allowed within NRF areas highlights the need to document the silvicultural, operational, and economic effects of such practices and guidelines; (6) Given that the definition of NRF habitat in the glossary included structural legacies of trees that are more than 200 years old, it appears that the concept of allowing NRF habitat to “move” around NRF management areas over the course of the HCP misrepresents what can actually occur because the plan only goes for 100 years; and, (7) In eastern Washington, the standards for allowing management within NRF habitat create a high price to pay for minor mistakes (e.g., if the tree density standard is not met).

A few commentors posed the following questions regarding management standards within NRF areas: (1) Of the factors listed that may be considered in a landscape assessment process, when habitat in excess of the target amount is to be harvested, which ones will DNR actually commit to considering? (2) What quantity of sub-mature characteristics must be present in determining if an additional five percent of sub-mature habitat can be manipulated? (3) What is the basis for determining that two years is an adequate amount of time to detect whether or not sub-mature characteristics have been attained or retained after manipulations? (4) Is the sub-mature habitat that is not designated as nesting habitat subject to a total aggregate 10 percent harvest limitation during the research phase or are successive five percent harvests allowed as long as the most recently harvested five percent meets the sub-mature definition? (5) Is it silviculturally appropriate to allow partial cutting in old growth? (6) What are DNR’s assumptions about partial harvesting of old growth (i.e., how much will take place and under what conditions) and can this actually take place? (7) Will roads be prohibited to access partial harvest units if they require the removal of habitat for construction? (8) What happens if a natural event causes a stand that has been treated as part of the five percent limit to not meet the sub-mature habitat definition -- will any further harvest in the WAU be prohibited until that stand has recovered? (9) How will the two year, five percent

limitation on harvest within sub-mature habitat affect timber sale contract extensions? (10) Is the two year, five percent limit on partial harvest of sub-mature habitat too restrictive in eastern Washington, given that this will only allow a stand to be entered approximately every 40 years and that spotted owls appear to do fine in stands that have been partially harvested? (11) Is the landscape assessment process used to determine habitat amounts and a plan for harvest of habitat in WAUs that exceeded the specified target subject to NEPA and/or approval by the federal government?

Response: The HCP has been modified to incorporate the suggestion that harvest be avoided around known nest sites in demographic support areas until those sites move. If the HCP is adopted, DNR will avoid harvest of habitat within 0.7 mile of known nest sites in WAUs in which the amount of habitat exceeds the target level. In addition, the Service (or its designee) has committed to conducting spotted owl surveys in WAUs in which habitat is, or will soon be, available for harvest in order to update locations of site centers. These surveys will be conducted every three to five years, and DNR will use this updated survey information in planning harvest activities within NRF areas.

DNR and the Service think that habitat management for conditions that support flying squirrels is a more biologically sound approach to spotted owl conservation than using nest boxes as a surrogate for snags. In addition, many other wildlife species will benefit from the continued existence of snags in the landscape.

The Service does not think that it is necessary to establish reserves in which logging is prohibited in order to successfully provide habitat for spotted owls. Such requirements would also make applying for an ITP and preparing an HCP an action that would not fit DNR's purpose and need.

The management of Type A habitat and provisions for salvage logging are addressed previously under the comment category *Nesting, roosting, foraging habitat*.

The operational, silvicultural, and economic effects of the spotted owl management guidelines will be documented as either part of the monitoring and research component of the HCP or, for those economic aspects not required to be reported as part of the monitoring plan, as part of the regular business operations of DNR.

The definition of NRF habitat contained in the glossary of the HCP is a generalized definition and was not intended to convey stand-level requirements under the spotted owl conservation strategy. The definitions, along with guidelines for amounts, distribution, and management activities permitted that are described in Chapter IV, Section A of the draft HCP, are those by which to assess what will occur on the ground. Thus, it is not misleading to portray the spotted owl strategy as one in which the location habitat will move over time as habitat targets are exceeded in NRF areas. (See also the clarified NRF habitat definition as described under the comment category *Nesting, roosting, foraging habitat in this section.*)

DNR and the Service do not agree with the commentor who stated that the standards used to allow management within forest stands that are already sub-mature habitat are a high price to pay for small mistakes. The fact that management will be allowed in sub-mature habitat at all represents a high degree of confidence in the ability of foresters to manage within spotted owl habitat and still have that habitat function in the intended manner. This is still largely a management hypothesis. The standards established constitute an experimental safeguard against mistakes that could be quite expensive for spotted owls.

Of the listed factors that may be considered when conducting landscape level assessments in WAUs in which habitat has exceeded target levels, DNR is not committing to carrying out any of them in the legal sense of commitment because it would be difficult to define what constituted a legal commitment to “considering” these factors. However, the intent of this language is that DNR make a good faith effort to provide habitat in an arrangement and of quality that is optimal for spotted owls.

When existing sub-mature habitat is manipulated under the provisions of the HCP, all the characteristics described in the definition must be present in order for an additional 5 percent to be available for management activity.

The rationale for the two-year period for assessing the retention of sub-mature habitat characteristics and for a minimum period before any subsequent partial harvest can take place was developed by the Washington State Forest Practices Board Spotted Owl Science Advisory Group (SAG). Their thinking was based on the following reasons: (1) Spotted owl prey populations could be negatively impacted immediately post-harvest due to mechanical destruction of food sources, burrows, and dens; (2) Two years would allow prey populations to recover

and may allow spotted owl populations to adapt to new structural characteristics; (3) The full extent of habitat modification may not be apparent immediately post-harvest; and (4) Two years would likely allow measurement of those changes. The SAG also cited unpublished data from Lorin Hicks in which owls fitted with radio-transmitters avoided areas in which partial harvest activities had taken place for two years (Hanson et al. 1993 p.73).

The two-year, five percent guideline does not limit manipulations in sub-mature habitat to an aggregate of 10 percent during the research phase, but it allows successive five percent areas to undergo partial harvest as long as the previous 5 percent meets sub-mature characteristics.

The provision of the draft HCP to allow degradation of old forest to sub-mature outside of nest patches represents another attempt to allow maximum flexibility for DNR while providing owl habitat. The HCP Science Team viewed this option as a higher risk option than one that did not allow such degradation. The Board of Natural Resources directed DNR staff to further develop the higher risk option, which became Alternative B. If, after the nest habitat provisions have been met, along with the other requirements of the HCP, any old-forest habitat that is available for manipulation could be degraded to sub-mature habitat. It is not yet clear how much of this type of management activity will take place until the nest patches have been delineated and the marbled murrelet habitat relationship study and inventory have been completed. Experimental manipulation of old growth would occur in the OESF.

The goal of the OESF is to learn how to integrate production and conservation in managed forest, including conserving the ecosystem values of old-growth forests (draft HCP p. I.14 and 15, IV.69 through 74). In that regard, it is likely that partial cutting in old-growth forests will be one of the techniques tested to learn how to achieve that integration. The few existing studies relevant to partial-harvesting in old growth are retrospective studies of sites that were harvested for reasons other than integrating ecosystem and commodity outputs. But it is thought that partial harvesting in old growth is a silvicultural technique that might have some promise for integrating production and conservation goals (Franklin 1989, Franklin and Spies 1991, U.S. Department of the Interior 1992). One of the goals of the OESF is to learn whether, and how, it is silviculturally appropriate to conduct partial harvests in old growth.

It is likely that partial cutting in old growth will proceed cautiously in the OESF for several reasons: (1) It is not known how effective such a technique will be in meeting diverse objectives, thus thoughtful experiments will need to be designed, implemented, and evaluated before larger-scale partial-cutting efforts would be initiated; and, (2) Few areas are available for such manipulative experiments because, under the spotted owl conservation strategy for the OESF, old-forest habitat can not be reduced below 20 percent of any landscape planning unit and current estimates are that only 4 of 11 landscapes have more than 20 percent of that cover type (draft HCP p. IV.77-78, 86-87). Most, but probably not all, of the estimated old-forest habitat in HCP Table IV.5 (draft HCP p. IV.78) is old-growth forest. In addition to owl conservation, partial harvest in old-growth stands in the OESF is constrained by the riparian conservation strategy, in the near term (and likely the long term as well) by the marbled murrelet conservation strategy. Without the constraints of the riparian and murrelet strategies, current estimates are that approximately 12 percent of the existing old-growth forest would be available for partial-cutting. It is likely that with full realization of the riparian and murrelet strategies, the amount of old growth available for partial cutting would be somewhat less.

Road construction would be prohibited only if such construction brought the habitat level below 50 percent in a WAU, or if it was planned to go through the 0.7- mile core of a known nest site.

If a natural event caused a stand that had been treated as part of the five percent not to meet the habitat definition, further manipulation in existing sub-mature habitat would be prohibited until that stand recovered.

Timber sale contract extensions would be granted under current DNR contract language. However, if the contract in question covered the maximum 5 percent of sub-mature habitat in a WAU, no other contracts could be offered in sub-mature habitat in that WAU for at least two years after completion of management activities under that contract. The time until the next sale would only be more than two years if the previously harvested five percent had not yet attained sub-mature characteristics.

Given the amount of spotted owl habitat that would be released from harvest restrictions due to spotted owl circles in eastern Washington, DNR and the Services do not think that the five-percent, two-year limitation on manipulation of sub-mature habitat within NRF areas is too restrictive.

The landscape assessment process used to determine amounts of habitat and plans for harvest in WAUs is not subject to NEPA review on an assessment-by-assessment basis. The results of the assessments will be reviewed by the Service only as part of monitoring plan implementation during regularly scheduled reviews.

nest patches

Summary: WDFW, the NWIFC, Point No Point Treaty Council, the Tulalip Tribes, National Audubon Society, Sierra Club, WEC, Northwest Ecosystem Alliance, Black Hills Audubon Society, nine individuals (four signers on one letter), and Bogle & Gates (a consultant to Washington State University) commented on the provisions for spotted owl nesting habitat within the HCP. The most frequent comment on this topic is that the 300-acre nest patches are inadequate. Several commentors requested that a minimum of 500 acres of nest habitat be required within a 0.7-mile-radius of a nest patch and some commentors made general requests that the amount of nesting habitat be increased. One commentor requested that 500 acres be retained around all known sites. Two commentors stated that the HCP allows less than 300 acres of high-quality nesting habitat within a nest patch. Other comments are as follows: (1) The scientific rationale for 300-acre nest patches described in the HCP is weak, and other sources indicate more habitat should be included; (2) In the OESF, riparian management zones will not provide areas large enough to provide adequate nesting habitat with interior forest conditions; (3) Criteria for success of nest habitat creation experiments during the research phase should be that a resident pair has successfully bred for a minimum of five years; (4) success of nest habitat creation should be occupation of a site by a breeding pair for three consecutive years; (5) We do not know enough about how spotted owls choose their nest sites to know whether the proposed strategy of creating nest habitat will work; (6) Research results on creation of nest habitat should be approved through a peer review process before any habitat within nest patches is harvested; (7) Nest site protection should not be based on location of current site centers; (8) DNR should acknowledge that the research phase for nesting habitat renders it impossible to predict harvest levels after the research phase is complete; and, (9) DNR assumes a heavy burden by stating that it will ensure that adequate nesting habitat is provided.

The following questions were posed regarding the nest habitat provisions of the HCP: (1) How long will it take to demonstrate that DNR can successfully use silvicultural techniques to create

nesting habitat in managed stands; (2) What are the standards for success; (3) How long will it take to locate nest habitat patches on the ground; (4) For how many WAUs must this process be completed; (5) Is the intent of the HCP not to require nest habitat patches or a research phase in the east side planning units; and (6) What is the advantage of the nest habitat approach over the spotted owl circle approach?

Response: Examination of age-class distribution data on DNR-managed lands and distribution of known status 1 and 2 site centers and an initial examination of new forest inventory data collected by DNR over the past five years show that DNR-managed lands currently do not contain enough high-quality nesting habitat to meet the requirements established in the HCP, both in terms of stand-level characteristics and landscape-level distribution of forest that contains nesting structure. By adopting the strategy of requiring two 500-acre patches (300 acres of high quality nest habitat with a 200-acre buffer of sub-mature habitat, or better) per 5,000 acres of designated NRF areas, with these patches being embedded in a larger landscape of suitable spotted owl habitat (sub-mature quality or better), the overall quality of habitat will improve over time. The riparian and murrelet provisions of the HCP will add patches of older forest habitat throughout NRF landscapes that will exceed the acreage of older forest retained in nesting habitat patches. Given all of these factors, the HCP strategy will accomplish its objective of providing demographic support to the population. The Service thinks that this is an acceptable approach.

As was noted above, the draft HCP has been modified such that all habitat within 0.7 mile of known nest sites in NRF areas will be retained.

The commentor who stated that the provisions of the HCP allow less than 300 acres of high-quality nesting habitat to be included in nest patches is in error. Habitat that meets the high-quality definition in the HCP will be included first. There are cases however, where there will not be enough high-quality nesting habitat available in a particular 5,000-acre landscape to establish a 300-acre nest patch. In such cases, the next best available habitat will be protected and allowed to develop into higher quality habitat.

The rationale described in the HCP for establishing 300- acre nest patches with a 200-acre buffer of sub-mature or higher quality habitat is based on the work of Irwin and Martin (1992). As was noted above, data analyzed by Bart (1995) and in the

Forest Practices Board FEIS for the Permanent Spotted Owl Rule (WFPB 1996a) does not give conclusive results on how much habitat spotted owls need around their nests. The HCP acknowledges that information regarding adequate amounts of nesting habitat at the stand and landscape level is less than conclusive and thus DNR has included an extensive research plan to answer these questions. DNR also commits in the HCP to provide adequate amounts of nesting habitat per the results of this research program. Furthermore, if the HCP is adopted, DNR is committed not to harvest existing habitat within 0.7 mile of known nest sites.

The comment in regard to provision of nest habitat through the OESF riparian strategy is addressed under topic heading *Nesting, roosting, and foraging habitat* in this section of the FEIS.

Comments regarding what criteria should be used to determine whether spotted owls are successfully reproducing in managed landscapes have been noted and will be considered during the development of the specifics of the nesting habitat research plan.

The commentator who noted that we do not know enough about how spotted owls choose their nest sites to know if creating nesting habitat will work is correct. The proposed strategy is a management experiment that includes monitoring and research programs designed to test the hypothesis that nest habitat can be created through management. The Service and DNR think that the proposed strategy of retaining existing nest structure in the landscape is adequate protection while these owl management questions are researched.

Research results regarding creation of nest habitat and any new management guidelines based on this research will be approved by the Service before nest habitat in the 300-acre patches becomes available for management.

In its harvest modeling of the spotted owl strategy, DNR assumed that the research phase would last for the entire permit period because it was not possible to model potential new management strategies based on the results of the research phase. The assumptions used in the harvest model are included in the FEIS.

DNR and the Services disagree that DNR is assuming a heavy burden by stating that it will ensure that adequate nest habitat will be provided. The Service cannot issue an ITP if the

applicant's proposal will appreciably reduce the likelihood of survival and recovery of a species. If DNR did not ensure provision of adequate amounts of nesting habitat in NRF areas, the Service could not issue an ITP based on this criterion.

It is not known how long it will take to demonstrate that DNR can successfully use silvicultural techniques to create nesting habitat in managed stands. This is why no time limit was attached to the research phase. The standards for success will, in general terms, be the observance of successful spotted owl reproduction for a consistent period of time in stands that have been subject to a variety of treatments which resulted in the creation of nesting structure. The specific standards for success will be determined based on the best available science regarding spotted owl ecology.

Nest patches will be located on the ground during the first field season after the HCP has been approved. Designation of nest patches will occur in a maximum of 48 WAUs. It could be a smaller number if two nest patches are placed in a large WAU. The nest patch strategy does not apply to the three east-side planning units because spotted owls nest in sub-mature habitat in the eastern Cascades.

The nest habitat patch approach is different than the spotted owl circle approach because these patches will occur within a larger landscape context in which 50 percent of NRF areas in each WAU will be in a suitable habitat condition. The circle approach results in a maximum of 40 percent habitat within a median home range radius of a site center. Establishing nest patches is a way of ensuring that nesting structure is distributed within NRF areas in a configuration thought to be used by spotted owls (i.e., habitat concentrated within a 0.7 mile area). In contrast to the former "500-acre rule", the nest patches will not constitute the only habitat available to spotted owls in the landscape.

dispersal habitat

Summary: Two individuals and Bogle & Gates (a consultant to Washington State University) made general comments regarding spotted owl dispersal habitat. These comments are as follows: (1) There is no scientific evidence that dispersal habitat works; there should be numbers associated with down woody debris and green tree retention portion of dispersal habitat standards; (2) There should be validation monitoring of dispersal habitat; and, (3) harvest parameters of dispersal habitat need to be clarified in the HCP.

Response: While there is no evidence that dispersal habitat will “work”, there is no evidence that it will not work. The ability to create spotted owl dispersal habitat in a managed forest is a working hypothesis. Thomas et al. (1990) and the Northern Spotted Owl Recovery Team (USDI 1992b) both supported the concept of creating spotted owl dispersal habitat through forest management. In fact, the Northern Spotted Owl Recovery Team thought that providing dispersal habitat was the most appropriate role of some nonfederal lands.

The optimal characteristics of forests that can function as spotted owl dispersal habitat are not known. Current descriptions of dispersal habitat do not include down woody debris, and for this reason, down woody debris is not included in DNR’s definition of dispersal habitat (draft HCP p. IV.11 to 12), but down woody debris will be incorporated if and when research demonstrated its necessity (draft HCP p. IV.18). The draft HCP states that in dispersal management areas four green trees per acre will be retained from the largest size class (draft HCP, p. IV.12). The optimal silvicultural treatments for developing dispersal habitat are not known. For this reason, and in order to retain operational flexibility, the harvest parameters are not specified in the draft HCP.

Validation monitoring of dispersal habitat is impractical. A monitoring program that would have reasonable statistical power would be unreasonably expensive. Validation monitoring of dispersal habitat would require radio-tagging a large number of juvenile owls. The number of owls tagged and tracked through radio-telemetry would need to be very large because only a small proportion of those tagged might actually traverse DNR-managed dispersal habitat. For this reason, effectiveness monitoring is a much more reasonable approach to evaluating the value of dispersal habitat on DNR-managed lands.

dispersal-designated areas

Summary: WDFW submitted comments specific to designated dispersal areas in the draft HCP. They had recommendations for additional dispersal areas near Spada Lake and in the southern portion of the Mineral Link area.

Response: Given the areas included for NRF management, the existence of the Greider Ridge NRCA in the Spada Lake Basin and the proximity of these NRF areas to federal reserves to the north and south, DNR and the Service do not think that additional dispersal habitat designations are warranted.

In the Columbia Planning Unit, the HCP proposal has been modified to include DNR-managed lands south of the Mineral Block that occur within the Mineral Link SOSEA designated under the new state spotted owl rule as dispersal management areas (see map IV.3 in Appendix 3 of this document). Dispersal areas in the North Puget Planning Unit have also been modified such that the western portion of the Harry Osborn State Forest (west of Township 7 North) has been changed from dispersal to no role. This change is consistent with the Finney SOSEA boundary.

quality/definition

Summary: WDFW, NWIFC, Point No Point Treaty Council, Bogle & Gates (a consultant to Washington State University), and three individuals commented on dispersal habitat definitions. These comments are as follows: (1) The justification for dispersal habitat definition is not well supported by the literature, and DNR should do validation monitoring to verify usefulness of dispersal habitat; (2) Use the definition of dispersal habitat developed by Beak Consultants for the Murray Pacific HCP; (3) Include down woody debris as a component of dispersal habitat; (4) The definition for dispersal habitat needs more snags; (5) Fifty percent canopy cover does not constitute dispersal habitat; (6) Harvest age of dispersal habitat is too old; and (7) NRF habitat should be double counted as dispersal habitat so as to reduce the regulatory burden for providing dispersal habitat.

Response: It is true that the definition for spotted owl dispersal habitat is not well supported by the scientific literature, but this reflects the current state of knowledge. The definition was based on the best scientific information available. Furthermore, the definition in the draft HCP is an interim definition (draft HCP, p. IV.17). DNR's definition is very similar to that developed by Beak Consultants (1993), and DNR's definition may change over time as more is learned about the creation of dispersal habitat in managed forests. The same can be said regarding the amount of down woody debris, snags, and canopy cover.

The draft HCP does speculate about the harvest age of forests in dispersal management areas (p. IV.137), but it does not specify a harvest age. The harvest age of forests managed for dispersal habitat will depend on the landscape conditions within a WAU, but more importantly, it will depend on the final definition for dispersal habitat and the silvicultural treatments used to develop habitat.

NRF management areas also function as dispersal habitat, but counting them as dispersal habitat would not reduce the regulatory burden for providing dispersal habitat. DNR's HCP designates dispersal habitat areas in order to reduce the regulatory burden for providing NRF habitat in areas where it was thought the provision of NRF habitat would not make an important contribution to spotted owl conservation in Washington State (draft HCP p. IV.3). This strategy was considered the most efficient means to meet the purpose and need of the proposed action (DEIS, p. 1-2 to 1-4).

amounts/distribution

Summary: The Muckleshoot Indian Tribe, one individual, and Bogle & Gates (a consultant to Washington State University) submitted comments pertaining to the amount and distribution of dispersal habitat. Comments are as follows: (1) In the South Puget Planning Unit, designated NRF areas are useless without adjacent NRF areas; (2) Dispersal areas in the Klickitat Planning Unit are far from federal reserves or DNR NRF areas; and, (3) Dispersal areas farther than 2 miles from federal reserves make no sense -- the HCP itself acknowledges that lands further than two miles serve no useful function for spotted owls. One commentor wanted to know if there were spatial requirements for dispersal habitat beyond the 50 percent requirement in a WAU in western Washington and questioned how harvest calculations were made for eastern Washington given that estimates were not made of how much dispersal habitat existed in the east side planning units.

Response: There are two large blocks of DNR-managed land designated as dispersal management areas in the South Puget Planning Area. One is intended to facilitate dispersal to the Late Successional Reserve known as the Mineral Block. The other is intended to facilitate dispersal between federal Late Successional Reserves and Seattle's Cedar River watershed.

The HCP does not say that lands farther than 2 miles from federal reserves serve no useful function for spotted owls. Lands beyond 2 miles from federal reserves can serve a useful function as spotted owl NRF habitat, but the draft HCP spotted owl conservation strategy designates very little DNR-managed land beyond 2 miles from federal reserves as NRF management areas. A distance of 2 miles was used for the designation of NRF management areas because 2 miles was thought to be a reasonable compromise between DNR's trust mandate and the ESA Section 10 criteria for the issuance of an ITP. Dispersal management areas many miles from federal reserves do make

sense if they are located between large blocks of NRF habitat. For 111 juvenile spotted owls studied in the Wenatchee National Forest and on the Olympic Peninsula, the mean dispersal distance was approximately 15 miles (E. Forsman, unpubl. data; USDA Forest Service, Corvallis, OR). During the same studies, one juvenile owl dispersed 76 miles.

(B) eagles--bald

Summary: The National Audubon Society, Northwest Ecosystem Alliance, and WEC said that DNR's draft HCP was inadequate for bald eagles and that an ITP should not be issued. In particular, all three groups said that state Forest Practices Rules and state wildlife regulations are inadequate. The National Audubon Society and WEC also stated that an ITP for the bald eagle should not be issued for the east-side planning units because the prescriptions for large, structurally unique trees do not apply there.

Response: Measures for protecting eagles and their habitat include provisions for retaining large, structurally unique trees, maintenance of salmonid habitat through the conservation of riparian areas and wetlands on the west-side planning units (explained in draft HCP p. IV.46). Site-specific management plans in both the east and west-side planning units (Forest Practices Rules) will also ensure protection of active nests. These strategies and the snag and green tree retention requirements added to the HCP, (see Appendix 3 of the document) should provide an adequate amount of suitable roosting and nest structures, as well as protection of potential food sources in the west-side planning units. Most bald eagle nesting and wintering areas occur within the west-side planning units. Bald eagle populations have doubled every 6 or 7 years since the 1970's, rising 10 percent since 1993 to more than 4,500 nesting pairs (Vickery 1995). State Forest Practices Rules for bald eagles have contributed to this recovery. Therefore, it seems reasonable to DNR that continuation of this strategy will provide adequate protection of this species.

USFWS has concerns that site-specific management plans in the east-side planning units will protect only nest sites and communal roosting sites, and provide no protection of other eagle use areas such as foraging sites.

(C) falcons--peregrines

Summary: The National Audubon Society, Northwest Ecosystem Alliance, and WEC and a local organization said that DNR's draft HCP was inadequate for peregrine falcons and that an ITP should not be issued. In particular, all four groups said that state Forest Practices Rules are inadequate. The National Audubon Society and WEC also stated that an ITP for the peregrine falcons should not be issued for the east-side planning units because the prescriptions for cliffs do not apply there. The

local organization recommended more protection around peregrine nest sites.

Response: Through negotiations with USFWS additional protection for the peregrine falcon has been incorporated. Management of cliff habitats will include measures for retaining obvious perch/nest trees and trees that maintain the integrity of cliff habitat on both west- and east-side planning units. Also, DNR will survey sites identified as suitable for peregrine falcon occupancy to prevent direct harm to the species (draft HCP, Chapter IV, Section F). In addition, public access to DNR-managed lands within 0.5 mile of a known peregrine falcon aerie will be restricted, and aerie locations on DNR-managed lands will be kept confidential. State Forest Practices Rules have contributed to the increasing peregrine falcon population, which is now estimated at more than 1,000 pairs in the contiguous 48 states (USFWS 1995). The Services expect these measures, in addition to the stated commitment to limit human disturbance near known aeries, will provide adequate protection of the ecological requirements for this species.

(D) accipiters--goshawk

Summary: WDFW is concerned about the contraction of the species' geographic range. WDFW recommended that goshawk nest sites be protected through site management plans, that harvest rotations be lengthened in some areas to provide more mature forest, that more snags and green trees be retained in clearcuts, and that goshawks be protected in areas outside of NRF management areas. One individual said it was unfortunate that goshawks in the eastern Cascades would not be protected.

Response: It is outside the scope of DNR's HCP to address problems with the contraction of the geographic range of the goshawk. However, DNR does recognize that conservation measures can be developed to protect the goshawk on all DNR-managed lands. Developing an HCP is a voluntary process in which applicants are free to include whatever lands they choose in their plan. Applicants are also free to choose the conservation measures they wish to implement to get coverage for unlisted species. DNR chose not to include conservation measures for goshawks east of the Cascade crest. If the goshawk becomes listed, DNR will not be issued an ITP for goshawks where they occur on DNR-managed lands on the eastside. In the west-side planning units goshawks will likely benefit from the owl, murrelet, and riparian ecosystem conservation strategies. Murrelet habitat, as well as owl NRF management areas and dispersal habitat, will provide potential nesting structures and dispersal habitat for goshawks. The riparian buffers will also provide potential nest structures that likely will be protected when adjacent stands develop. Within NRF management areas all active goshawk nests will receive seasonal protection. The strengthened snag and green retention tree conservation strategy will also be a source of

potential nest structures, especially the commitment to retain large, unique wildlife trees and one tree of the largest size in each harvested unit (Appendix 3, Chapter IV, Section F of this document). These strategies contain provisions for some habitat to continue to grow and develop throughout the HCP term (e.g., the 300-acre nest patches, occupied murrelet stands, and riparian buffers) while other potential goshawk habitat such as sub-mature stands in NRF management areas will move around the landscape. Although extending harvest rotations and/or site management plans would provide additional benefits to goshawks, it is anticipated that goshawk habitat will be available in some areas of all west-side planning units as a direct result of the HCP conservation measures. These conservation strategies, which take a habitat-based approach, will be in addition to protection required by state law to protect from harvest snags or trees known to contain active goshawk nests.

iii. Passerines

(A) Vaux's swift

Summary: WDFW said that lack of snags in certain regions may lead to low populations of Vaux's swifts. NWIFC said that determining whether a hollow snag is a Vaux's swift nest site can only be done during the nesting season. Bogle & Gates (a consultant to Washington State University) wanted to know the impact on harvesting of the mitigation measures for Vaux's swifts.

Response: The green tree retention provision of the HCP, which was better in quality than state Forest Practices Rules, has been strengthened to include a total of five green trees. In addition to the large, structurally unique tree and one from the largest size class of living trees, three more green trees will be retained from the codominants (Appendix 3, Chapter IV, Section F of this document). A provision to retain snags has been added to this conservation strategy. DNR will leave three snags greater than or equal to 20 inches dbh where possible, with a minimum dbh of 15 inches. Where snags at least 15 inches dbh are not available, a one-for-one replacement will be made with green trees. Preference will be shown for hard snags, and large hollow snags greater than or equal to 40 feet in height. All leave trees will be left in the harvest unit, and through subsequent rotations, thus ensuring they continue to function as wildlife trees. This measure to protect current snags and provide future snags should result in the availability of potential Vaux's swift habitat on DNR-managed lands throughout the HCP area. Instead of attempting to determine whether specific snags are used by Vaux's swifts to justify protecting the snag, a preference for retaining large, hollow snags likely to be used by Vaux's swifts (and other wildlife) is built into this conservation strategy, thereby negating the need to conduct Vaux's swift surveys during the nesting season. The Department of Labor and Industry standards preclude the retention of all snags. Only safe snags will be

retained, and therefore there should be no impacts to timber harvesting with implementation of this part of the strategy. There will be some impacts to harvesting with the retention of additional green trees in that not all trees available for harvest under state Forest Practices Rules will be harvested. The intent of retaining these trees is to provide habitat for a variety of currently unlisted species to, hopefully, preclude future listings and additional harvest restrictions and provide adequate mitigation for the take of unlisted species that may occur in the future while conducting timber harvest activities.

C. REPTILES

Summary: The Northwest Ecosystem Alliance requested more protection for riparian and wetland areas because six of Washington's reptile species are associated with wetlands. One individual expressed a concern for pond turtles because of their role in the food chain.

Response: A goal stated in DNR's HCP is "no net overall loss of naturally occurring wetland acreage and function". The draft HCP contains riparian protection of Types 1 through 3 streams and wetlands protection for wetlands greater than 0.25 acre in the form of buffers that will be 100 feet wide or a site potential tree, whichever is greater. Type 4 streams will have 100-foot buffers on each side of the stream, and it is expected that at least 50 percent of Type 5 streams will have buffers resulting from the strategy to protect steep and unstable slopes. All the buffers will be measured on the horizontal distance, a provision that has been changed from the draft HCP (Appendix 3, Chapter IV, Section F of this document). A minimum basal area of 120 square feet per acre will be maintained in the forested portions of wetland buffers. The wetlands buffer should provide adequate protection for the types of marshes, ponds, sloughs, and small lakes the western pond turtle has been known to inhabit. DNR must still adhere to state Forest Practices Rules that require a SEPA environmental checklist for activities within 0.25 mile of a known individual occurrence of the western pond turtle. However, these additional measures should ensure that the loss of habitat for wetland-dependant species will not occur.

d. AMPHIBIANS

Summary: WDFW was concerned about the protection of forested talus for the Larch Mountain salamander. NWIFC said that buffers should be placed on Type 4 and 5 streams because they are important as amphibian breeding habitat. They also asked how the Services will calculate the number of individuals incidentally taken if an amphibian species is listed in the future. Point No Point Treaty Council suggested amphibian surveys be part of the evaluation of effects of forest management activities along Type 5 streams. Point No Point Treaty Council and WEC said that seeps, Type 5 streams, and moist talus should receive greater protection because they are inhabited by Van Dyke's salamander. The Northwest Ecosystem Alliance requested more protection for riparian and wetland areas because amphibians are sensitive to changes in hydrology, water temperature, and substrate characteristics resulting from timber harvest. A local group urged

DNR to design harvesting plans that will allow the dispersal of less mobile species such as amphibians. An individual pointed out that the disappearance of frogs and toads change the food chain and asked whether research information would indicate habitat restoration that will continue the food chain.

Response: Concerns about the Larch Mountain salamander are addressed in the response to concerns about special habitats (see p. 3-13 in this section) and in the response to concerns about adequate protection of talus (see p. 3-17 and 3-18 in this section). The effects of the Riparian Conservation Strategy for the five west-side planning units and the Olympic Experimental State Forest are detailed in the DEIS, p. 4-396 to 404. The Services and DNR believe that the buffers of a site potential tree height or 100 feet, whichever is greater, on both sides of Type 1 through 3 streams, and 100-foot buffers on both sides of Type 4 streams are scientifically justified and would provide all the important habitat elements necessary for protecting amphibians. This is particularly true for stream-breeding amphibians. All Type 4 Waters that were classified prior to January 1, 1992, must either be verified in the field or assumed to be Type 3. Type 5 Waters are considered important to amphibians, as well, and all Type 5 Waters flowing through an area with a high risk of mass wasting will be protected according to the subsection titled Unstable Hillslopes and Mass Wasting (draft HCP, p. IV.56 and 57). It is expected that 50 percent of these streams will be buffered through this strategy. A 10-year research program will be initiated to study the effects of timber activities along Type 5 Waters (draft HCP, p. IV.54). As a result, a long-term conservation strategy for Type 5 Waters will be developed and incorporated into the HCP. Outer wind buffers will be applied to protect the riparian buffer in areas that are prone to windthrow. Types 1 and 2 Waters, and Type 3 streams wider than 5 feet, with moderate potential for windthrow, will receive 100-foot and 50-foot wind buffers, respectively, along windward sides. Where riparian buffers could be subject to strong winds, wind buffers will be placed along both sides providing additional protection to riparian obligate species. These measures will result in a forested network of riparian buffers made up of many dispersal corridors for amphibians and many other riparian obligates. Documentation shows, several species of frogs benefit from the herbaceous cover and subsequent increases in local invertebrate populations provided by recently harvested areas. An increase in sunlight reaching a small stream or wetland has also been shown to increase aquatic invertebrate populations, thus providing a short-term increase in the forage base for stream-dwelling amphibians.

Implementation monitoring will document the types, amounts, and locations of forest management activities carried out on the plan area. Effectiveness monitoring will document changes in habitat conditions, including general forest structures and specialized habitat features (e.g., large woody debris). Monitoring will ensure that habitat requirements for amphibians are met. Specific populations will not be surveyed or monitored, rather habitat will be monitored by comparing it to the baseline condition of quality and quantity over the life of the plan. In the event that a species' further existence might be jeopardized by the action (the HCP), the strategy for that species will be reevaluated and

amended appropriately to address the species needs. The premise of the HCP is to preclude the need to elevate the status of an unlisted species by providing adequate habitat for that species through the provisions of the plan. Without a conservation plan, an unlisted species receives little consideration. The Services and DNR are confident that habitat for amphibians on the plan area will improve as a result of the measures undertaken in this HCP and that this improvement will in turn not contribute to the subsequent need to elevate the present status of amphibians as a result of activities carried out under DNR's HCP.

i. Frogs (in section 3.3 only)

e. FISH

Summary: The American Rivers group stated that healthy fish populations and rivers are of critical importance to the economy of Washington. Fifty-one individuals (and identical letter sent by 51 individuals) commented that riparian areas are very important to all kinds of fish. One individual pointed out that DNR works for the public and that there is a responsibility to protect fish for the public.

Response: DNR agrees that it is important to maintain healthy fish populations in the streams that drain DNR-managed lands and other lands as well. The riparian strategy that is presented in the draft HCP on pages IV.51 to 67 is a scientifically based attempt to provide a protection and restoration strategy for fish habitats on DNR-managed lands.

i. Anadromous salmonids

Summary: Clallam County believed that habitat degradation is not the problem, overfishing is. The Squaxin Indian Tribe commented that most Washington streams lack most salmon habitat components. The tribe also said that the state of knowledge about salmonids and riparian zones is such that the trends are toward increased protection, and therefore, marginal improvements over current practices are simply not adequate to protect these resources over the long term. The tribe was concerned about protection of salmon through treaties that were signed between the tribes and the federal government. The Elwha/Clallam Tribe said that they are mostly concerned about watershed health and salmon populations. The Hoh Indian Tribe asked how the OESF will fit with the wild salmon policy. The Tulalip Tribes suggested that DNR develop information on the potential limiting factors for each species and quantify this, where possible, for existing stocks.

Bogle & Gates (a consultant to Washington State University) stated that salmon are already protected by current regulations, policies, and guidelines. The Northwest Forestry Association stated that just using salmonid freshwater habitat as a "proxy" to evaluate the effects of riparian conservation says that fish are of no consequence; therefore, numbers of fish should be evaluated with proper acknowledgment of factors influencing this data. The

Mountaineers said that protection of salmonids and salmon habitat is a very important part of the whole HCP strategy.

A local group said the most critical issue for salmon is "...how to best sustain propagation in our streams." An individual commented there is a need to protect and restore crucial salmonid habitat on DNR-managed lands, or to curtail land-use activities on DNR-managed lands that negatively impact salmonid habitat outside of DNR-managed lands. Also, he said that DNR's draft HCP failed to utilize state-of-the-art salmonid or forest invertebrate conservation biology. The same individual also pointed out the need to think more on a watershed basis of the effects of clearcuts on stream habitat.

An individual said that DNR must protect spawning grounds. Another individual said that salmon declines are caused by timber harvest. An individual stated that the HCP Alternative B riparian protection is not enough to protect salmon. Many individuals (51) implied a need to protect the remaining old-growth timber for salmon.

Response: Recent reviews of the status of Pacific Northwest salmon stocks indicate that many are either already extinct or are in an at-risk status. The causes of these declines have been summarized into four general categories: (a) overharvest of weaker stocks, (b) problems caused by hatcheries, (c) hydropower facilities, and (d) habitat loss. Nehlsen et al. (1991) concluded that there is a need for a paradigm shift that "...advances habitat restoration and ecosystem function...for many of these stocks to survive and prosper into the next century." Undoubtedly the decline of pacific salmon has come from myriad of impacts, and to solve this problem will require the recognition by all impactors of the need to do their part to work toward a comprehensive solution.

DNR is aware of the status of salmon stocks in Washington, as is pointed out on pages III.66 through III.73 of the draft HCP, and understands the need to develop a comprehensive, scientifically based approach to habitat protection to put salmon habitat on the road to recovery. DNR believes that the riparian conservation strategy for the five west-side planning units presented on pages IV.51 through 67 of the draft HCP is just such an approach.

The large number of instances in which habitat degradation and simplification have been cited as a factor in salmonid stock declines suggests that loss of critical habitat has played an important role in some extinctions, particularly species spending extended periods in fresh water and undertaking extensive seasonal movements within the drainage system. At present there is little direct evidence that diversity of fishes has been reduced in simplified streams in the Pacific Northwest because few studies have attempted to relate fish community composition to habitat characteristics (Bisson et al. 1992). Some of the few studies that have addressed loss of habitat diversity after logging were carried out by Erman et al. (1977) on aquatic insects and Bilby and

Bisson (1992) on loss of diversity in forms of terrestrial organic matter entering streams. Bisson and Sedell (1984) found that streams in western Washington from which logging debris had been removed had fewer pools and longer riffles than streams in old-growth forests. Although total salmonid biomass was greater in logged and cleaned streams than in old-growth sites, the communities were dominated by underyearling trout and there were proportionately fewer older trout.

Most salmon streams on DNR-managed lands have been logged in past years at least once. The lack of understanding of watershed processes and riparian function during those years often resulted in salmonid habitat degradation due to logging, and today many streams are still recovering from past practices. There is a clear recognition in the draft HCP riparian strategies (p. IV.54) of the need to "...maintain and restore the quality of salmonid habitat..."

As explained in the Forest Resource Plan, the protection of salmon habitat on DNR-managed lands is a legitimate objective for the department. The purpose of the riparian conservation strategy for the five west-side planning units (draft HCP, Chapter IV, p. IV.51 to 68) is to meet this objective. After exhaustive literature review, it was concluded that the No Action alternative was not sufficient to protect salmon habitat. That alternative did not address the riparian ecosystem needs to the extent that was called for in the literature, and it did not sufficiently address logging near drainages on steep and unstable slopes. Restoration of riparian ecosystems is an objective of riparian management, and this is discussed on pages IV.54 and 55 of the draft HCP. A restored riparian forest will lead to the natural recovery of inchannel habitat, a recovery that will be sustainable through the long term. Active restoration of inchannel salmon habitat (i.e., log placement, gravel supplementation, etc.) is a separate issue outside the commitments of the draft HCP, but one that can still be accommodated if the Board of Natural Resources approves the HCP. Along with forest management in RMZs, attention paid to unstable slopes and mass wasting, road network management (draft HCP, p. IV.56), hydrologic maturity in the rain-on-snow zone (draft HCP p. IV.56 and 57), and wetlands protection (draft HCP, p. IV. 57 and 58) are an attempt to address salmon habitat protection on a watershed basis.

DNR thinks that Alternative B is clearly a scientifically sound approach to riparian ecosystem protection and one that is justifiable under the current DNR Trust mandate.

The counting of salmon will definitely help monitor the effectiveness of the various habitat protection measures that have been brought out in the draft HCP. Monitoring salmon populations (both catch and spawning escapement numbers) is the responsibility of the WDFW, not DNR.

(A) coho

Summary: An individual commented there is a need to protect small streams to benefit coho salmon.

Response: Coho salmon are the most ubiquitous salmon species, utilizing many different kinds of habitat, including not only mainstem rivers, but also the innumerable medium to small headwater tributaries and floodplain wall-base channels. The intent of the draft HCP riparian strategy is to protect all water types -- large and small streams, lakes, ponds, and wetlands.

ii. Resident salmonids

(A) bull trout

Summary: The WDFW said that bull trout are extremely sensitive to water temperature and that work around Type 5 Waters could compromise the state or federal government's ability to avert an elevated listing of bull trout. WDFW recommend future research on this species. The Yakama Tribe pointed out that several eastern Washington bull trout populations are in jeopardy, "yet no emphasis is placed by DNR in the draft HCP or Draft EIS (for bull trout on the east side)."

A local conservation group suggested that DNR "...check for bull trout and wherever present should ensure that their habitat requirements such as cool water temperatures are being met." An individual stated that USFWS should not issue a permit to DNR because of the inadequacy of the buffers on Type 1 through 4 Waters and discretionary buffers on Type 5 Waters. An individual expected bull trout will probably be listed in western Washington some time in the next 100 years. Many individuals (51) said there is a need to check for bull trout on DNR lands and, whenever they are present, to ensure that their habitat requirements, such as cool water temperatures, are being met and that this should apply to the waters upstream of bull trout habitats as well.

Response: Protection of bull trout, a member of the collective family of salmonids, is assumed to occur in the five west-side planning units under the draft HCP riparian conservation strategy. Bull trout can be found in streams on both sides of the Cascade Range, and those within the west-side planning units will benefit from the draft HCP. DNR-managed lands east of the Cascade crest are not covered by the draft HCP riparian conservation strategy.

f. INVERTEBRATES

Summary: The Northwest Ecosystem Alliance, The Mountaineers, two local environmental organizations, and 51 individuals commented on invertebrate species issues. The Northwest Ecosystem Alliance requested more protection for riparian and wetland areas because 248 terrestrial invertebrates are associated

with wetland and riparian habitats. The 51 individuals, who mailed an identical form letter, questioned how DNR could provide for all species, including invertebrates, if all old-growth forest on DNR-managed lands is to be “quickly liquidated.” The Mountaineers and one local organization assert that DNR’s draft HCP does not adequately address forest invertebrates.

Response: The riparian conservation strategy for the five west-side planning units and the OESF, detailed in the draft HCP, Chapter IV, parts D and E, will provide habitat for invertebrates. The Services and DNR believe that the buffer widths of a site potential tree height or 100 feet, whichever is greater, on both sides of DNR Types 1 through 3 Waters, and 100-foot buffers on both sides of Type 4 streams is justified and would provide a substantial amount of the important habitat elements necessary for protecting invertebrates in the riparian and some habitat for upland invertebrates. Type 5 Waters flowing through an area with a high risk of mass wasting will be protected according to the subsection titled Unstable Hillslopes and Mass Wasting (draft HCP, p. IV.56 and 57). It is expected 50 percent of these streams will be buffered through application of this strategy providing protection for invertebrates in headwater areas. These measures will result in a forested network of riparian buffers made up of many dispersal corridors for riparian obligates and other species.

The conservation goal for wetlands is to allow no overall net loss of naturally occurring wetland acreage and function. Wetland buffers will be 100 feet with low ground disturbance which should protect the invertebrates associated with wetlands and adjacent vegetation. Additional protection is provided for bogs and mineral springs, which are specialized habitat types (Appendix 3, Chapter IV, Section F of this document). Protective measures have been developed for other special habitat types such as talus, caves, and cliffs. The conservation strategies for these special habitat types in conjunction with the murrelet, owl, and riparian ecosystem conservation strategies provide some protection for all habitat types that occur on DNR-managed lands within the range of the northern spotted owl. This includes old-growth forests. Old-growth stands occupied by murrelets will be protected in the short term until a long-term plan is developed with the USFWS. It is anticipated that some potential murrelet habitat will be harvested, however, many occupied murrelet stands will be protected. The owl strategy in the OESF Planning Unit is designed to retain old-forest habitat, most of which is old growth, at a level that is 20 percent of each of the OESF planning units. The result of this strategy is that much of this old growth will remain until such time as DNR can demonstrate to USFWS that they can replicate the structure and function of old growth. Old growth will also occur in the other west-side planning units as 300-acre nest patches distributed throughout the landscape. Although these are not large acreages, they will provide refugia for many old-growth-dependent invertebrate species.

The premise of the HCP is to preclude the need to elevate the status of an unlisted species by providing adequate habitat for that species through implementation of the plan. Without an HCP, an unlisted species receives little

consideration. The Services and DNR are confident that, overall, habitat for invertebrates on the plan area will improve as a result of the measures undertaken in this HCP and that this improvement will in turn avoid the subsequent need to elevate the present status of invertebrates as a result of activities carried out under DNR's HCP. Specific populations will not be monitored, rather habitat is monitored by comparing it to the baseline condition in quality and quantity over the life of the plan. In the event that a species' further existence might be jeopardized by the HCP the strategy for that species will be reevaluated and amended appropriately to address the species needs.

i. Lepidopterids

Summary: One local group recommended that 50 percent of currently existing potential Oregon silverspot butterfly habitat be protected.

Response: No existing potential Oregon silverspot butterfly habitat is known on DNR-managed lands within the planning area. A small parcel of potential habitat on Long Beach Peninsula was sold to the State Parks and Recreation Commission in 1994. (See DEIS, p. 4-353.)

g. OTHER WILDLIFE ISSUES

i. Listed species and species of concern

Summary: A local organization requested that sensitive species be protected to prevent their decline to levels requiring that they be listed as threatened or endangered. Fifty-one individuals, using the same form letter, requested that sensitive species be protected everywhere they occur, not just in NRF Management Areas. Two other individuals claimed that DNR's draft HCP would "wipe out" half of the remaining endangered species in Washington in the next 10 to 20 years. Another individual asserted that very little evidence was presented that additional protection of endangered species is necessary. One individual asked if recovery is a goal, then how many years of new management practices are necessary?

Response: The HCP proposes a habitat-based approach to conservation for all species, including species of concern. The primary assumption with regard to the goal of the unlisted species conservation strategy is if adequate amounts of habitat of sufficient quality are provided, these species will persist. The question is whether the combination of the described protective measures, natural diversity within the habitats on DNR-managed lands, and the diversity of treatments to be implemented under the HCP would provide a sufficient amount of habitat. Without an HCP an unlisted species receives little consideration.

The HCP is the principle document supporting DNR's application for incidental take permits and unlisted species agreements. The Services can issue incidental take permits and unlisted species agreements only if the HCP satisfies the criteria listed in Section 10 of the ESA. Additionally, the overall

multispecies conservation strategy of the proposed HCP is designed to provide sufficient protection of habitat for species of concern to meet Section 10 needs. Through negotiations, DNR and the Services have agreed to modifications of the draft HCP that will improve habitat protection for species of concern. These modifications include strategies relating to snag and green tree retention, talus, cliffs, balds, and springs and seeps. The overall multispecies conservation strategy of the proposed HCP should provide better protection of habitat for species of concern than Alternative A.

Implementation of the HCP is unlikely to “wipe out” half of the endangered species in the state of Washington. The Services think perhaps the commentors were referring to the fact that the HCP would have negative impacts on between 123 and 151 known and projected spotted owl site centers whose regulatory circles overlap DNR-managed lands. These sites would be at risk for incidental take and they represent between 40 and 49 percent of known and projected sites impacted by DNR-managed lands. (See response under the heading Old-Growth Habitat in this section.)

Whether additional protection of endangered species is necessary is a contentious issue. For the marbled murrelet, there is a high degree of uncertainty about population sizes and rates of population change, therefore, DNR has proposed a conservative approach to habitat management.

Recovery is the goal for threatened and endangered species. The number of years that new management practices will be necessary depends on the species. The recovery or listing status of listed species is periodically reviewed, but estimates of the time period until full recovery are rarely attempted. For most listed species, accurate estimates of a recovery period are difficult, if not impossible, to calculate.

E. ECOSYSTEM HEALTH

Summary: Washington Wilderness Coalition, one local organization, and 64 individuals, 51 of whom used an identical form letter, expressed concerns about ecosystem health. The vast majority of these comments requested that ecosystems be preserved or adequately protected. A few such requests used the terms “ecologically sound” or “sustainable” to describe the protection of ecosystems. The Washington Wilderness Coalition believed that Alternative C comes closer to ensuring the health of forest ecosystems. One individual asserted that the ESA should be used to preserve ecosystems. One individual stated that DNR’s draft HCP is ecologically sound. Another individual said that more research is needed to improve our understanding of ecosystems.

Response: DNR’s proposed HCP is a habitat-based plan consisting of conservation strategies whose essence is ecosystem health. Without the means to provide for long-term productivity and management flexibility, DNR would not be meeting its trust obligations. The monitoring program and the research program provide the tools to refine the conservation strategies through time, as new knowledge is gained.

V. HUMAN ENVIRONMENT

Summary: One local chapter of a national conservation organization and four individuals provided comments on the Human Environment. One individual asserted that managing for predators is unsafe for humans. A commentor wrote that an increasing human population increases pressure on state forests to produce revenues. Two individuals commented that the HCP undermines the ESA and is therefore harmful to the human environment. Black Hills Audubon Chapter wrote that ancient forests need to be protected, not just for biodiversity, but to perhaps provide healthful benefits to humans that are as yet undiscovered.

Response: The Services agree that certain predators can be dangerous to humans. The Services and DNR disagree that managing habitat to mitigate for the possible incidental take of certain wildlife species is inherently dangerous to humans. The Services acknowledge the various pressures our growing population creates on the state's forests. The Services note that the ability of nonfederal landowners and managers to prepare HCPs is provided in the ESA and therefore are one method of complying with the ESA.

A. ECONOMICS

Summary: Environment Resource Center, GBA Forestry Inc., Inland Wood Specialties, Green Crow, Mt. Baker Plywood, Washington State Association of Counties, Cascade Hardwood, State Representative Mark Schoesler, City of Port Angeles, Port of Port Angeles, American Rivers, Clallam County Commissioner Phillip Kitchel, Northwest Forestry Association, Washington Forest Protection Association, Washington Contract Loggers Association, Bogle & Gates (a consultant to Washington State University), Merrill & Ring, Northwest Timber Workers Resource Center, Western Hardwood Association, and 7 individuals all provided comments on the Economic Effects Analysis provided in the DEIS. While some commenters focused much of their comments on the economic analysis, others mentioned it among many other topics on which they also provided comments. However, all comments fell into one of the following categories:

- ! The DEIS needs to provide more details on the derivation of the projected harvest levels that were used to develop the economic effects analysis;
- ! Provide more specific information about the assumptions and methods used in estimating both the harvest levels and the economic effects;
- ! The analysis should also provide regional effects to income as well as to employment;
- ! Economic effects include degradation of fish resources;
- ! The analysis should use a greater range of sensitivity analysis;
- ! The analysis failed to consider the effects of the proposed HCP on "X resource." X resource ranged in comments from operational costs at the unit or stand level, to the effects on specific industries, such as those based on hardwood supplies; and

! The analysis cannot possibly be any good because it is only five pages long.

The Services and DNR also received commentary and criticism for not including an analysis of the effects on trust revenues under the proposed action. Again, these types of comments took several, related forms. Predominantly, commentors requested information on overall effects of implementing an HCP on income to the trusts. A very few commentors suggested the analysis should predict effects on revenue flows on a trust-by-trust basis for all 26 trusts.

Response: The Council on Environmental Quality has addressed, in NEPA implementing regulations, the need for economic analyses in environmental documents. Specifically, when an environmental impact statement is prepared and economic or social effects are interrelated with natural or physical environmental effects, then the environmental impact statement will discuss all of the effects on the human environment (40 CFR 1508.14). Determining what economic variables are interrelated to issuance of this ITP has been the subject of much attention preceding the preparation of the DEIS. Obviously, many of the measures of economic effect are influenced by factors (such as those suggested by commentors for inclusion in the present analysis) well outside the scope of the process of issuing a Section 10(a)(1)(B) ITP. Examples of such influences include market and nonmarket factors. On the one hand, the volume of timber harvest is clearly affected by the proposed action and was predicted by DNR. On the other hand, any attempt to address the myriad economic factors outside the scope of the proposed action, for example grade and species of timber, would have been outside the scope of the necessary analysis.

The analysis of the impact of the proposed HCP alternative on regional employment, by planning unit, was performed by the USFWS. Regional employment was selected as an indicator of predictable economic effects for this HCP largely because of the interrelation of this economic measure with the human environmental effects of the proposed action. Furthermore, the effects of similar actions on employment has been a prominent concern of both the government and affected communities in recent years. For example, the economic effects analysis performed for the SEIS on the President's Northwest Forest Plan focused primarily on the effects of the alternatives on regional employment. Similarly, economic effects analyses performed in NEPA environmental documents for the analysis of other recently approved HCPs in this region have focused on local employment effects (Plum Creek Timber Company and Weyerhaeuser Millicoma). Where the land base involved in recently approved HCPs was too small to have appreciable effects in the local community, analyses have focused on employment effects within the applicant's own business (Port Blakely Tree Farms and Murray Pacific Corporation).

Perhaps the strongest precedent for performing an employment impacts analysis for the environmental documentation prepared for the present proposed action, was the Environmental Assessment prepared for the Oregon Department of Forestry's (ODF) Elliott State Forest ITP application. ODF, a state forest land manager overseeing commercially productive forests under mandates similar to DNR's, assisted the USFWS preparation of their Environmental Assessment, including the economic effects analysis.

That analysis examined the effects of various predicted harvest levels on employment and income in the affected communities there. While the size and scope of DNR's proposal are larger than was ODF's, the core criteria in forming the scope of the economic analysis are the same: The action proponents are both state agencies that manage state forest lands under similar revenue production and resource protection mandates.

Following the precedent of prior ITP applications, the USFWS performed the employment effects analysis based upon the same harvest level predictions that DNR developed for its presentation of effects on trust revenues made to the Board of Natural Resources in 1995. While the analysis did not include effects on income in affected communities, a regional income analysis has been prepared in response to comments and is included in the FEIS. On the other hand, DNR had already prepared and presented an analysis of predicted effects on trust revenues to the Board of Natural Resources, in public meetings, in advance of the publication of the DEIS. Since DNR need not prepare an economic analysis for its SEPA purposes, a written version of the trust income analysis was not prepared for the DEIS.

In response to public comments, the Services and DNR have provided information regarding the assumptions DNR used in developing the harvest predictions for its trust presentation, and that the Services relied on in preparing the DEIS's employment effects analysis. A discussion of the assumptions used in developing harvest level projections appeared in an unpublished DNR report entitled, "Background and Analytical Framework for the Proposed Draft Habitat Conservation Plan." For the convenience of commentors requesting this background information, the chapter of that report that discusses the underlying assumptions used by both DNR and USFWS has been attached to this document, and can be found in Appendix 5. A two page synopsis of methods used by DNR to develop the harvest level projections is also included in Appendix 5 of this document.

In response to suggestions about the contents of the analysis, the Services emphasize that an HCP such as the one at-issue here, is a programmatic document composed of the elements stated in ESA Section 10(a)(2)(A). Suggestions were made that the EIS expand the level of analysis of silvicultural effects and logging operations effects. A suggestion was made that the analysis consider the effects of natural regeneration regimens. These suggestions would be more appropriately made regarding an operations-level proposal, not for a programmatic proposal such as the present proposed action. For an HCP, forest practices changes at the stand or unit level are rarely analyzed except to discuss prescriptive aspects of take mitigation, if at all. In recently approved forest land HCPs in this region, analysis of economic effects of stand level operational factors has not been conducted. Accordingly, analysis of issues such as the effects of the proposed action on the costs of operating in individual sale units is beyond the scope of the present analysis, and not examined.

In response to comments regarding the derivation of the projected harvest levels, the methods used by DNR to develop those projections are provided in this document, as mentioned above. The manner in which those projections were used by USFWS in

developing the analysis of effects on employment was provided in the DEIS in section 4.10.

In response to comments suggesting the analysis would be more complete with an accompanying analysis of regional income effects, the Services have prepared an analysis which is presented in Section 2 (Changes to the DEIS) of this document.

In response to those comments requesting the analysis be conducted by trust land base, the Services and DNR reiterate that the projections themselves were conducted by planning unit, without differentiating amongst the individual trusts. This approach reflects DNR's desire to prepare the HCP without separating the individual trusts. Since the harvest level projections were generated by planning unit, regional employment and income analysis was conducted by planning unit as well.

In response to those requests for a baseline analysis for comparison of economic effects, such an analysis is presented in the DEIS. NEPA's core tasks of public disclosure and informed decision making are accomplished by comparison of the increment of effects amongst the several action alternatives and the No Action alternative. The baseline for comparison is the level of effects that would occur under the No-Action Alternative. As presented in the DEIS, the effects of the proposed action (employment levels under the proposed HCP alternative) are compared to the effects of no action (employment levels under the No Action alternative). This comparison is typical of NEPA analysis. The DEIS analysis has been enhanced in response to public comment by including analysis of effects to income by planning unit as well.

In response to comments that the analysis should consider nonextractive values or values from sources other than timber that can be derived from forest management such as special forest products and recreation, the Services and DNR note that these values were considered in response to scoping. DNR informed the Services that it already derives some value from these resources and that no change of income would accrue regardless of the alternative selected. Accordingly, the Services did not analyze effects to these resources. The Services note further that in scoping the proposed action, development of an alternative based on emphasizing income from these sources was considered but eliminated from detailed analysis as beyond the scope of alternatives that DNR could practicably implement. This determination was based on the fact that DNR's mandate regarding income would make such an alternative too expensive to implement based on forgone timber harvests and the fact that DNR derives a very small percentage of Trust Revenues from the harvest and sale of these resources.

In response to comments suggesting that the economic analysis should account for the effects of the proposed action on salmon and the industries that rely on them, the Services note, as explained elsewhere in this section, that implementation of the proposed HCP would have a net beneficial effect on this resource, and an induced net benefit to any sector that relies on this source. This is supported by the analysis provided in the EIS of the effects of the proposed action on habitat factors that would receive beneficial treatment as the result of implementing the proposed HCP.

In response to those commentors that suggested the analysis is inadequate because, proportionally, it is too short, the Services are mindful that ultimately, the responsible official has to make its decision on permit issuance in light of the statutory permit issuance criteria stated in ESA Section 10(a)(2)(B). NEPA analysis expands on these criteria by ensuring the decision maker also considers other factors that the ESA may not require, such as effects on the human environment. However, where the difference in effects to a certain resource is insignificant, NEPA demands no further attention to those resources. Effects are considered insignificant where, among other things, no net adverse effect is predicted.

B. SOCIAL

Summary: Rivers Council of Washington suggested DNR consider how the HCP could bring about a political, social and cultural climate of stewardship among private landowners.

Response: If an HCP has the effect described by the commentor, then that is an unexpected beneficial result of the Section 10 process. Purposefully achieving that result is beyond the scope of the proposed action and has not been analyzed.

C. CULTURAL

Summary: The Muckleshoot Tribe commented that DEIS Table 4.9.2 does not mention trade corridors to Stampede Pass. The Yakama Indian Nation stated that a professional archaeological survey is necessary for every project prior to any ground-disturbing activity and that a tribal cultural specialist should be consulted regarding non-archaeological resources for each project. The Tulalip Tribes asked that survey techniques to identify cultural resources and management responses to avoid impacts to those resources be defined. Both the Tulalip Tribes and Yakama Indian Nation mentioned that despite procedures for protection of culturally important sites in the HCP, they have yet to be contacted by DNR prior to site operations that might have affected such sites.

Response: Table 4.9.2 is illustrative, not comprehensive. Omission of any particular resources of cultural import was not intended to imply that such resources would be ignored under the proposed action. Instead, the Services believe that project level effects should be adequately addressed under the procedures described in the DEIS. The Services were disappointed to receive reports from at least two individual Tribes that DNR had yet to comport with those described procedures. The Services expect that the commitment to those procedures will be upheld as the Services have relied on those commitments in assessing DNR's mitigation commitments. Furthermore, complying with the stated commitments is a condition of permit issuance. As such, failure to comply with those commitments would be grounds for suspension or revocation of the requested permit.