AMERICAN FOREST
RESOURCE COUNCIL

July 6, 2012

Public Comments Processing
Attn: FWS–R1–ES–2011–0112
Division of Policy and Directives Management
U.S. Fish and Wildlife Service
4401 N. Fairfax Drive, MS 2042–PDM
Arlington, VA 22203

Dear Sir/Madam:

The American Forest Resource Council (AFRC) submits the attached comments on the proposal to revise the designated critical habitat for the northern spotted owl (Federal Register / Vol. 77, No. 46 / Thursday, March 8, 2012), the Draft Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl (May 29, 2012) and the Draft Environmental Assessment: Designation of Critical Habitat for the Northern Spotted Owl (June 4, 2012).

AFRC represents over 60 forest products businesses and forest landowners in the western United States. Our mission is to create a favorable operating environment for the forest products industry, ensure a reliable timber supply from public and private lands, and promote sustainable management of forests by improving state and federal laws, regulations, policies and decisions that determine or influence the management of all lands.

The proposal to revise the designated critical habitat for the northern spotted owl fails to meet the requirements of section 3(5)(A) of the ESA and accompanying regulations as the process used is incapable of determining what areas were "*occupied at the time of listing*" and/or are "*essential for the conservation of the species*."

The Draft Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl fails to meet the requirements of section 4(b)(2) of the ESA and accompanying regulations as it misrepresents the current situation (baseline) therefore grossly underestimating the economic consequences of the proposal.

The Draft Environmental Assessment for the Designation of Critical Habitat for the Northern Spotted Owl fails to disclose the true environmental consequences of the proposal as it is based on the faulty processes of the previous two documents.

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The proposal to revise the designated critical habitat for the northern spotted owl and economic analysis should be completely redone using processes that will meet the requirements of sections 3(5)(A) and 4(b)(2) of the ESA.

Our detailed comments and analysis are attached.

Very truly yours,

Tom Partin
President

Comments on the proposal to revise the designated critical habitat for the northern spotted owl (Federal Register / Vol. 77, No. 46 / Thursday, March 8, 2012), the Draft Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl (May 29, 2012) and the Draft Environmental Assessment: Designation of Critical Habitat for the Northern Spotted Owl (June 4, 2012)

Submitted By the American Forest Resource Council
July 6, 2012

Comments on the proposal to revise the designated critical habitat for the northern spotted owl (Federal Register / Vol. 77, No. 46 / Thursday, March 8, 2012),

The proposal to revise the designated critical habitat for the northern spotted owl fails to meet the requirements of section 3(5)(A) of the ESA and accompanying regulations as the process used is incapable of determining what areas were "*occupied at the time of listing*" and/or are "*essential for the conservation of the species*." The Draft Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl fails to meet the requirements of section 4(b)(2) of the ESA and accompanying regulations as it misrepresents the current situation (baseline) therefore grossly underestimating the economic consequences of the proposal. The Draft Environmental Assessment for the Designation of Critical Habitat for the Northern Spotted Owl fails to disclose the true environmental consequences of the proposal as it is based on the faulty processes of the previous two documents. The proposal to revise the designated critical habitat for the northern spotted owl and economic analysis should be completely redone using processes that will meet the requirements of sections 3(5)(A) and 4(b)(2) of the ESA.

1. Requirements of Sections 3(5)(A) and 4(b)(2) of the ESA

Section 3(5)(A) of the ESA mandates that areas designated as critical habitat be limited to one of two cases. The first is to areas "*occupied by the species, at the time it is listed*" that contain "*those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection*." The second is that the Secretary can designate "*specific areas outside the geographical area occupied by the species at the time is listed"* if (s)he determines "*that such areas are essential for the conservation of the species*." The USFWS asserts that "*the vast majority of lands included in the proposed designation were occupied at the time of listing*" but is assuming that they might not be

so has "*tentatively determined that all of these lands are essential to the conservation of the species*" regardless as to whether they were occupied at the time of listing or not.

It appears from this statement that the only legal basis that the USFWS can use to support the proposed revision is the second of the two options listed above, i.e. the Secretary can designate "*specific areas outside the geographical area occupied by the species at the time is listed*" if (s)he determines "*that such areas are essential for the conservation of the species*." The USFWS cannot support or provide any scientific evidence backing their claim that "*the vast majority of lands included in the proposed designation were occupied at the time of listing*" even with their new interpretation of determining what occupancy at the time of listing means. In fact, the 1989 spotted owl status review, which was used as the basis for the 1990 listing, states that there were only 1,500 observed pairs. Given an average of 4,000 acres per home range, this would equate to a maximum of 6 million acres (or 4.5 million acres with average overlap between home ranges), which is far less than the almost 14 million acres being proposed for designation. However, since the USFWS has no record of where almost all of those 1,500 pairs were located, it is impossible for them to determine what areas were actually occupied at the time of listing, precluding their use of this a criterion for critical habitat designation. Therefore, the proposed revision of critical habitat is effectively based solely on the Secretary's determination that these lands are "*essential for the conservation of the species*."

While not explicitly stated in the ESA, the USFWS has interpreted this requirement to mean that the proposed areas must contain "*those physical or biological features*" "*essential for the conservation of the species*." They further go on to state that, *"[O]ur regulations direct us to focus on the "primary constituent elements," or PCEs, in identifying these physical or biological features*." Thus, the USFWS is asserting that all 13,962,449 acres of the proposed revision contain these "*primary constituent elements*." In our analysis below, we show how the process used by the USFWS to delineate the 13,962,449 acres proposed for critical habitat designation is incapable of distinguishing between which areas may contain physical or biological features essential for the conservation of the species and which do not. We also show that many of the proposed areas are already being managed more strictly than required by designation and therefore do not "*require special management considerations or protection"* and are therefore not eligible for designation.

2. Process Used By USFWS to Determine Critical Habitat Boundaries

The USFWS used a multi-step process to determine what areas contain *"those physical or biological features" "essential for the conservation of the species.*" Each step suffers from significant and undisclosed statistical and methodological errors.

Step 1. Obtain a depiction of the vegetation that existed in 1996 and 2006.

a. USFWS used the 1996 depiction to define habitat use and the 2006 depiction as their primary vegetation layer for delineating the 2012 revised critical habitat boundaries. They refer to this as the "GNN-LT Database."

b. The use of the GNN-LT database is inappropriate to determine what stands contain the primary constituent elements (PCEs) needed for the conservation of the species. This is because it does not depict what actual vegetative components exist on the ground, but is rather a computer simulation of what might exist on the ground. The researchers who developed the GNN-LT maps stated clearly that these tools are only suitable for use in broad scale assessments, and should not be used for site specific applications such as the delineation of stands that contain specific attributes, i.e. PCEs.

> *"Vegetation maps produced with the gradient nearest neighbor method are appropriately used for regional-level planning, policy analysis, and research, not to guide local management decisions"*[1]
>
> *"The GNN method predicts extremely well at the regional level and moderately well to poorly for specific sites, similar to other Landsat TM image classifications in our region. However, there exists a danger that the fine spatial resolution and detailed information content of the GNN predictions may imply a higher level of precision than actually exists. We stress that vegetation maps produced with GNN are appropriately used for strategic-level planning and policy analysis, not to guide local management decisions."*[1]
>
> *"Our own research has shown that at local scales, the spatial patterns resulting from different modeling techniques (e.g., GNN) can vary greatly. Caution should certainly be exercised if using these maps as input data for models that depend on local habitat connectivity, patch sizes, and structure."*[2]

[1] Predictive mapping of forest composition and structure with direct gradient analysis and nearest neighbor imputation in coastal Oregon, U.S.A., Janet L. Ohmann and Matthew J. Gregory Can. J. For. Res. Vol. 32, 2002

[2] Grossmann, E.B., J.S. Kagan, J.A. Ohmann, H. May, M.J. Gregory, C. Tobalske. 2008. Final Report on Land Cover Mapping Methods, Map Zones 2 and 7, PNW ReGAP. Institute for Natural Resources, Oregon State University, Corvallis, OR.

"Similarly, perfect accuracy for multiple vegetation attributes in the GNN predictions is impossible, because two plots never are exactly alike nor are the vegetation and explanatory factors perfectly correlated."[2]

c. One of the reasons that the GNN-LT vegetation layer is only appropriate for broad scale use is that there are significant errors between the predicted vegetative attribute of a stand and the actual values. These same authors found significant errors in the predicted value of basal area, quadratic mean diameter, trees/ha >100 cm DBH, stand age and species richness:

"Correlations between predicted and observed values for six measures of vegetation structure and composition ranged from 0.53 for tree species richness to 0.80 for quadratic mean diameter (QMD."[3]

The GNN's predicted values for the basic tree species found on a plot of land are erroneous between 11% and 47% of the time depending on the species. All of the six measures of vegetative structure and composition are variables that the USFWS identified as PCEs. In 2008, Grossman et.al. calculated the error associated with the GNN vegetative layer for the 7 sub-regions that encompass the range of the spotted owl. They found the following overall error factors, which represent the overall error and not the error associated with individual attribute which could be much higher:

- Northern East Cascades, Model Region 4 — 30% error
- Southern East Cascades, Model Region 5 — 28% error
- West Cascades, Model Region 6 — 35% error
- Klamath and Siskiyou Mountains, Model Region 7 — 25% error
- Willamette Valley, Model Region 8 — 29% error
- Oregon Coast Range, Model Region 9 — 30% error
- Northern Modoc Plateau, Model Region 10 — 22% error

d. The USFWS team that developed the models used to create the proposed critical habitat revisions recognized the errors associated with the GNN-LT vegetation predictions. They refer to "*plot correlations*" that are a measure of how well the predicted vegetation matches the real vegetation. There is a high degree of error associated with the GNN-LT data:

"For developing a priori models of spotted owl nesting/roosting habitat and foraging habitat, we generally selected GNN structural variables with plot correlation coefficients > 0.5 for an individual modeling region (42% were >0.7). On a few occasions when expert opinion or research results suggested a

particular variable might be important, we used variables with plot correlations from 0.31 to 0.5."[3]

The modeling team admits that this data was "*was specifically developed for mid- to large-scale spatial analysis*". Because of this, they conducted some "*informal*" analysis and decided to use it on a far smaller spatial scale for a critical habitat proposal not because it was accurate but because its error factor was less than other vegetation models which are plagued by the same deficiencies:

"Based on these informal evaluations, we determined that GNN represents a dramatic improvement over past vegetation databases used for modeling and evaluating spotted owl habitat, and used the GNN-LandTrendr maps as the vegetation data for our habitat modeling."[3]

Tables C-1 and C-2 of the Final Spotted Owl Recovery Plan show the correlation coefficients for the GNN-LT data used. These tables clearly show that there is significant difference between what GNN-LT predicts and what is actually found on the ground. These errors are associated with each individual stand attribute, and compound each other as they are combined into a set of PCEs or habitat definitions as was done by the USFWS. As stated earlier, Grossman, et al. found that "*perfect accuracy for multiple vegetation attributes"* (the use of multiple stand attributes like are used in the USFWS habitat definitions) "*is impossible."*

e. Dr. Larry Irwin with the National Council for Air and Stream Improvement (NCASI) conducted an analysis of how well the GNN-LT data correlated with actual measurements his researchers made on the ground. (Appendix A) His conclusion was based upon published literature and analysis of data from 6 study areas in 5 modeling regions where NCASI collected data from >18,000 ground-truthed vegetation inventory plots within spotted owl home ranges. The results show a very low correlation between the GNN-LT predictions and reality.

[3] U.S. Fish and Wildlife Service. 2011. Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service, Portland, Oregon. xvi + 258 pp. Appendix C

Table 1. Correlation coefficients for observed variable-radius vegetation-inventory plots against predicted for plot locations via GNN models[a].

Region	No. plots	Conif. BA	Total BA	Hdw BA	BA 3-25	Trees/ha
OCR	1779	0.51	0.48	0.06	0.02	0.05
WCS	3505	0.48	0.44	0.03	0.09	0.12
KLE	410	0.25	0.21	0.02	0.09	0.08
KLE	2092	0.30	0.20	0.16	0.10	0.08
EACS	4621	0.45	0.43	0.10	0.04	0.03
RDC	5570	0.28	0.14	0.08	0.03	0.03

[a] basal area of conifer trees > 3 cm diameter; Total BA is basal area of all trees > 3cm diameter; Hdw BA is basal area of all hardwood trees > 3 cm diameter; BA 3-25 is basal area of trees 3-25 cm in diameter; Trees/ha is number of trees per hectare > 3 cm diameter.

Dr. Irwin concludes, *"(T)he Service did not formally assess accuracy of GNN data. We could not confirm that GNN data were sufficiently accurate for more than a few of the vegetation variables used in MaxEnt, and those variables were inconsistently accurate."*

f. The differences between the GNN-LT model's stand predictions what is actually in a forest stand are so great that this data cannot reliably be used to identify actual stands that contain PCEs needed for the conservation of the species. The model creates a hypothetical landscape which at best is only useful for region wide, large scale, general planning level discussions. According to its creators, the GNN-LT model should not be used "*as input data for models that depend on local habitat connectivity, patch sizes, and structure"* which is exactly how the USFWS used it.

g. Because the base vegetation layer used by the USFWS does not accurately represent on-the-ground stand conditions it is impossible for it to show what stands contain PCEs and which do not. Since GNN-LT data this is the primary input to the subsequent models used to delineate the stands being proposed for critical habitat designation, any results of these models are unreliable and effectively meaningless.

Step 2. Collect Spotted Owl Location Data

a. The next step in the modeling process was for the USFWS to gather spotted owl location data. To lessen the impact the barred owl invasion is having on habitat use, they decided to use 1996 (pre-barred owl) data as the basis for their GNN-LT predicted vegetation layer. They then gathered spotted owl location data collected between 1993 and 1999. Because of the wide variation in survey effort, some areas contained significantly higher densities of spotted owl locations than others simply because they were sampled more intensely. To insure that these areas were not "*over-weighted*" they "*thinned*" the spotted owl location data which resulted in them discarding 25% of the known locations. No explanation of the basis for this approach, or of the 25% thinning figure, is provided anywhere.

b. While the thinning process addresses the over-weighting of heavily surveyed areas it does not address the under-weighting of areas that have received very little survey effort. As the USFWS modeling team states, "*Areas with few nest locations are a result of: 1) few surveys being conducted, 2) the absence of spotted owls, or 3) data being unavailable."*

c. Since there is no solution to knowing what areas are being used in areas that have not been surveyed (which represents the vast majority of the 24 million acres within the range of the spotted owl) the habitats being used in these areas are unknown and therefore under-represented in the process.

d. Thus, the conclusions drawn from the use of this biased owl location data cannot be reliably applied to the large areas within the spotted owls' range that have not been surveyed. The habitats being used in the heavily surveyed areas may in fact be quite different than the habitats being used in non-surveyed areas. While it is possible this approach *may be acceptable when making broad, non-specific suggestions and guidelines pertaining to spotted owl management, it is totally unacceptable w*hen trying to determine what the actual "*primary constituent elements*" that the spotted owl is using in these un-surveyed areas.

Step 3. Develop Habitat Definitions and Assign RHS Values

a. The first step in this stage of the process consisted of the USFWS creating 10 potential definitions of nesting/roosting habitat and 10 definitions of foraging habitat for each of 11 modeling regions. The boundaries of these regions as well as the habitat definitions themselves were based solely on professional judgment using the habitat variables available in the GNN-LT vegetation simulation database and other abiotic GIS layers such as temperature, slope, rainfall etc.. These habitat definitions were the USFWS's best guess as to what factors influence why spotted owls choose an area to live in. These were not tested at all to see how they relate to actual occupancy, survival, fecundity, or any other parameter one would use to assess their true validity. As will be discussed later, no one has been able to create habitat definitions that can accurately predict occupancy, survival, fecundity, etc., and the USFWS doesn't even attempt to validate theirs. Instead, they assume that all of the definitions they created have predictive powers that no one else has been able to achieve. Dr. Irwin of NCASI in his review of the proposed revision states:

> *"The scientific record does not reveal the existence of a strong, predictive relationship between measures of habitat conditions and any indicators of spotted owl population performance (Raphael 1996, Dugger and Davis 2011). Retaining sites with a recorded history of successful occupancy and reproduction seems obvious, but the habitat conditions supporting successful reproduction have not been well described. For example, reproductive rates are only weakly or negatively correlated with previous descriptions of NRF habitat (Franklin et al. 2000; Olson et al. 2004, Irwin et al. 2004). Although the correlations are often "statistically significant", they do not account for much of the variation and are somewhat contradictory, leading Gosselin (2009) to assert that the "habitat issue" for northern spotted owls remains unresolved." (Appendix A)*

b. These potential habitat definitions were then programmed into MaxEnt, which determined what the "*best*" definition was. Before USFWS performed this step, however, they first transformed the GNN-LT vegetation layer into indices and ratios through many Geographic Information System queries and transmutations. This is the first of many manipulations of data (smoothing or lumping of habitat characteristics) that they do in the whole modeling process, all of which break the link between what the real vegetation is on the ground and what the models represent.

c. Dr. Larry Irwin of NCASI conducted an analysis of how well MaxEnt and Zonation predicted occupancy of spotted owls. One of the fundamental premises of the USFWS is that the GNN-LT /MaxEnt /Zonation models accurately represent areas used by the spotted owl. Dr. Irwin compared the results of intensive on-the-ground spotted owl surveys for two areas he has been researching since 1990. He found that the process used by the USFWS did a very poor job of predicting where owls actually were and also where they might not be. (Appendix A)

> *"Of 61 occupied NSO sites in our western Oregon sample, 43% were classified correctly as occupied, while 57% were mis-classified by MaxEnt as unoccupied, or at least as having poor habitat quality. Such a high error rate was not a result of habitat loss that occurred prior to 1996, the first year of MaxEnt modeling. More than a third (37%) of 57 randomly-located sites where we did not detect any spotted owls during intensive surveys for 5 consecutive years were mis-classified by MaxEnt as occupied by spotted owls. In fact, 12% were mis-classified as having good- to high quality habitats."*
>
> *"For the eastern Washington Cascades landscape, nearly a third (32%) of 161 sites occupied by spotted owls in 1990 and in subsequent years were mis-classified as unoccupied. And more than a third of 48 sites classified as being unoccupied contained NSOs that exhibited a comparatively high rate of reproductive success."*

Dr Irwin concluded, "*Between the two areas, the overall combined error rate was over 40%, which is unacceptably high if MaxEnt output is to be used as input for predicting habitats occupied by NSOs in those areas in 1990."*

d. Above we showed how the GNN-LT vegetation layer is a mere prediction of what may exist on the ground and how in this application contains a high degree of uncertainty. The stated reasons the USFWS gives for why they did not use the original GNN-LT predicted vegetation layer as their input to their models are twofold. First they say that it addresses the caution by the GNN-LT creators that the data is only applicable to large scale planning so the USFWS decided not use the pixel by pixel data but rather values associated with conglomerating the pixel data into indices that represent the 200 ha circle around each pixel. Conglomerating GNN-LT values to the 200ha scale did not address the inapplicability of the GNN-LT data at small scales because in fact this small scale data was used to create the 200 ha indices. Also, the indices created by the USFWS from the GNN-LT data in the case

of habitat definitions combined between 2-4 GNN-LT variables which significantly increased the error associated with the predictions rather than decreasing the error.

e. The second reason the USFWS wanted to use data associated with a 200 ha circle was that they were attempting to model "*core*" areas used by the owl. The problem with this is that spotted owls are attracted to "*stands*" of trees with specific characteristics within a 200 ha circle around their nest sites, not to the average value of all of the stands within the 200 ha circle as the USFWS has modeled them. The processes they use actually wipe out all of these stands and replace them with a conglomeration of characteristics within a 200 ha circle. The net effect of this is the wiping out of all of the boundaries seen on the real landscape between stands having different vegetative characteristics thus breaking the link between what is inputted into the models and what they cite as being the PCEs. In fact, the USFWS indices do not even average stand conditions but rather the pixel by pixel GNN-LT data. These indices then represent some conglomeration of GNN-LT values which assigns one value to a pixel based on the 2,222 pixels surrounding it. All of this work was done through GIS assessments that are not discussed in detail in the proposed revision.

f. Below is an example to demonstrate these points. This picture shows the actual stands that are within one area of the proposed revision. For illustrative purposes, let us assume this is a 200 ha area. This area may be selected to be used by spotted owls because some of the stands within the area contain the habitat qualities described as PCEs by the USFWS (Dark bumpy green areas). These stands may contain the PCEs and therefore might warrant designation as critical habitat. There are many areas in that 200 ha area that the spotted owl does not use and might even avoid (Light colored areas). These stands do not contain the PCEs and therefore don't warrant designation. The process used by the USFWS wipes out all of the actual stands that might actually be used by spotted owls and instead assigns each pixel a conglomerate value for each habitat variable based on averages, sums or other indices. The USFWS uses these conglomerates as input to the modeling process which might then conclude that either all of them contain the PCEs or none of them do based on the 200 ha averages rather than the actual stands. If these conglomerates were mapped, one would see a rather uniform depiction across this landscape rather that the very heterogeneous, real landscape shown below.

g. The most important variable that determines the habitat suitability of an area is nesting and roosting habitat. The USFWS attempts to define these using GNN-LT variables that are then fed into MaxEnt. For one of the modeling regions, they use the percent canopy cover (CANCOV (≥80)), basal area (MNDBHBA_CON (≥60)) and the number of large conifer trees (TPHC_GE100 (≥7)) from the GNN-LT database in their nesting, roosting habitat definition. These variables can be measured in a real stand and GNN-LT predicts these values for each 30mx30m pixel. If a real forest stand is large enough, is contiguous enough and meets the standards set for these three variables, it might be used by spotted owls. However, neither the variables nor the information required to determine stand continuity or size is fed into the modeling process. Rather than using these variables, the USFWS assigns a single value to the pixel to represent the attributes, thus severing any connection between this value and what real stands may be on the ground.

h. The value assigned to a pixel based on the habitat definition is equal to the number of pixels in the 200 ha area around it that meet this definition, expressed in acres. Thus, instead of the model assessing percent canopy cover, basal area and the number of large trees, the model is only told that some number of acres of the 200 acres around the pixel contained the right values of these variables. Stand continuity, size and the real value of the stand condition (percent canopy cover, basal area and the number of large trees) are totally lost. ***A 200 ha area could contain 90 ha of pixels that meet the definition (giving it a NRxx value of 90)*** where these acres consisted of 1000 scattered pixels, or these 90 ha could be clumped into one 90 ha block. Each is given the same value and is treated the same in the modeling process. The first example would most likely not be used by spotted owls while the second could be suitable or even very suitable habitat for owls. In addition, of course, only a small fraction of the 90 ha may really exist on the ground. As shown above, when three GNN-LT variables are combined as in this habitat definition, the likelihood of accurately predicting that a pixel contains all three is near zero. Therefore, the likelihood that the manipulated data fed into the MaxEnt model accurately represent the true vegetative condition is zero.

i. The conglomerated data points described in above -- the thinned spotted owl locations layer as well as a number of abiotic feature layers (slope, elevation, precipitation, temperature, etc) -- for the entire 24 million acres within the range of the spotted owl were used as the input to the MaxEnt model to test the relative strength of the hypothetical suitable habitat definitions created by the USFWS. According to its developers, MaxEnt is "*(A) niche-based model* [that] *represents an approximation of a species' ecological niche in the examined environmental dimensions."*[4] The model's purpose then is to create an *"approximation"* of where a species might be found based on the environmental variable supplied to it. The model cannot predict presence of the species or pass any judgment as to the suitability of this approximation for purposes of defining conservation areas. Using MaxEnt as the USFWS did to support the claim that areas it ranks high contain *"those physical or*

[4] Phillips, S.J., R.P. Anderson, and R.E. Schapire. 2006. Maximum entropy modeling of species geographic distributions. Ecological Modeling 190:231–259.

biological features" "*essential for the conservation of the species*" is unsupported by those who developed the model.

j. Nevertheless, the USFWS had the MaxEnt model determine which of the multitude of hypothesized habitat definitions were the "*best*" definitions for each of the 11 modeling regions.[5] Their criteria for "*best*" was not how well the habitat definitions captured the real variables that the spotted owl needs to thrive, but rather which of the definitions had higher "*AUC*" and "*GAIN*" scores. AUC and GAIN are statistical tests which merely help to rank competing habitat definitions. These scores do not indicate how good the habitat definitions are in explaining why spotted owls are located where they are. The reason that past efforts to create habitat definitions intended to have predictive capability have been abandoned (described later), is that no definition has been able to explain more than 10% - 20% of the true factors influencing the survival of the spotted owl. Since the USFWS does not even try to validate their definitions, we have no way of knowing how good they really are. Absent a statistically validated determination that the habitat definitions are accurate, USFWS cannot and should not use those definitions to justify and support a critical habitat determination. In this proposal, USFWS improperly uses the "*best*" definition as determined by MaxEnt without knowing if this definition has any predictive power. Further, since MaxEnt was not given values for those "*physical or biological features,"* it could not assess if they are essential, which in any event is not a determination MaxEnt was designed to make.

k. Once the "*best*" definitions were established, MaxEnt ranks each of the 30m x 30m pixels within the modeling region such that the sum of all of the individual pixel values equaled 1. This is a fundamental underpinning of the MaxEnt model.[6] Pixels with low values do not contain as many of the components of the "*best*" definition as do pixels with higher values. There are thousands upon thousands of pixels within each region so the value given to each pixel is extremely small since there sum of them all must equal 1. Because of this and to increase MaxEnt's user-friendliness, these values are converted by MaxEnt into percentages. The percentage assigned to

[5] It should be noted that the errors associated with all of these input layers are compounded thus creating an even larger total error in the input data which aggravated the errors inherent to the MaxEnt model itself.

each pixel is the percentage of the total pixels that are equal to or less than the pixel in question.

> *"Maxent assigns a nonnegative probability to each pixel in the study area. Because these probabilities must sum to 1, each probability is typically extremely small. Although these "raw" probabilities are an optional output, by default our software presents the probability distribution in another form that is easier to use and interpret, namely a "cumulative" representation. The value assigned to a pixel is the sum of the probabilities of that pixel and all other pixels with equal or lower probability, multiplied by 100 to give a percentage."*[6]

l. The USFWS went through a number of exercises to determine if the habitat definitions picked by the MaxEnt model were robust, had sufficient "*discriminatory ability*" and were correctly "*calibrated*." The results of these test allowed the USFWS to feel comfortable that MaxEnt had picked the "*best*" habitat model for each modeling region of the habitat models they provided it. The USFWS modeling team correctly depicts the outputs of MaxEnt even though the USFWS critical habitat team does not.

> *"Elith et al. (2011) state that the MaxEnt logistic output is an attempt to estimate the probability that a species is present, given the environment (i.e., the environmental conditions). For our purposes, we have taken a more conservative interpretation of the MaxEnt logistic output and interpret it to represent the relative habitat suitability (RHS) for nesting spotted owls within each modeling region."*

They are clear that the habitat definitions chosen by MaxEnt do not represent what the spotted owl needs and do not delineate the *physical or biological features essential for the conservation of the species*. The modeling team defines the ranking done by MaxEnt as the relative habitat suitability (RHS) index. This is an accurate representation because all that MaxEnt does is rank all of the pixels within the given area by how well they meet the "*best*" habitat definition. The RHS in no way indicates how "*suitable*" each pixel is or how well it meets the "*best*" definition. In fact, the pixel with the highest MaxEnt score may not even meet all of the elements contained in the "*best*" habitat definitions. All MaxEnt is saying is that this is the best pixel among all of the pixels in the defined area.

[6] Phillips, S.J., R.P. Anderson, and R.E. Schapire. 2006. Maximum entropy modeling of species geographic distributions. Ecological Modeling 190:231–259.

m. The vegetative conglomeration done at the start of the MaxEnt modeling phase and the actual mechanics of the MaxEnt model make it impossible for the USFWS to support its claim that the modeling process defined areas that contain "*those physical or biological features*" "*essential for the conservation of the species*." The modeling team recognized this when its states,

> *"(I)t is important to understand that a high RHS value is possible for a pixel that has little inherent value (e.g. there are no trees in the 30x30 m focal pixel)." "Similarly, a focal point could have many of the positive characteristics that spotted owls generally select for, but it receives a low RHS value owing to the surrounding 200-ha having few or none of the attributes associated with high RHS values."*

n. The misuse of MaxEnt and the conglomeration of the data fed into it to define primary constituent elements are among the biggest flaws in the process used by the USFWS. First it uses a predicted vegetation layer instead of the actual vegetation that exists on the ground, and these predictions misrepresent the vegetation at least 30%-50% of the time and almost 100% of the time when using more than one variable. The habitat definitions used by the USFWS contain an average of 15 variables. Secondly, the vast majority of the range of the spotted owl has not been surveyed for owls so the habitat within these regions is severely unrepresented in the owl location data. Thirdly, the conglomeration of the GNN-LT data severs all connection with the real vegetation that exists on the ground. Fourth, the MaxEnt model is only capable of identifying the relative differences between pixels in relation to a hypothetical habitat definition given to it by the USFWS, but cannot tell how good the "*best*" definition is. Lastly, the USFWS fails to show how the hypothetical habitat definitions they developed for testing and the ones chosen by MaxEnt affect the different life function of the spotted owl such as survival, fecundity, site fidelity, juvenile dispersal or availability of a viable food supply that are the determining factors for identifying the PCEs.

o. There is a vast difference between what the MaxEnt model was designed to do and the outputs it was designed to produce and the manner in which the USFWS uses the model to define the PCEs essential for the conservation of the species. The only thing that the MaxEnt model does is produce an index that ranks the pixels against a hypothetical habitat definition. MaxEnt does not even produce a map which shows

the actual likelihood that a spotted owl may be present at a certain location let alone that the habitat definition relate in any way to what the spotted owl needs to survive. A RHS of 0.30 does not mean that there is a 30% chance that a spotted owl will use the habitat but only says that the 70% of the pixels were better and 30% were worse.

p. The fourth point listed above concerning the use of the MaxEnt model is that the USFWS fails to show how the model supports the adoption of its selected habitat definitions as defining the primary constituent elements, and that the maps produced by MaxEnt do not support the assertion that the areas they have chosen actually contain these elements. When discussing the physical or biological features essential to the conservation of the species, the proposal to revise critical habitat states:

> *"For the northern spotted owl, the physical or biological features essential to the owl are forested areas that are used or likely to be used by northern spotted owl for nesting, roosting, foraging, or dispersing. The specific characteristics or components that comprise these features include, for example, specific ranges of forest stand density and tree size distribution; coarse woody debris; and specific resources, such as food (prey and suitable prey habitat), nest sites, cover, and other physiological requirements required by northern spotted owls and considered essential for the conservation of the species. We consider these specific primary constituent elements (PCEs) later; here we describe the life-history needs of the owl and the physical and biological features essential to the conservation of the northern spotted owl, which informed our identification of the PCEs."*[7]

So while the above lists what elements might be included in the determination of the PCEs it leaves the final determination to be made by region. These regions are the same 11 regions used in the MaxEnt modeling process.

q. The proposed revision of critical habitat describes the steps it used to delineate the boundaries of areas that contain the physical and biological features essential to the owl. Step 1 states:

> *"Step 1: At the outset, the attributes of forest composition and structure and characteristics of the physical environment associated with nesting, roosting, and foraging habitat—physical and biological features used by the species—were identified based on the habitat selection exhibited by nearly 4,000 known owl pairs (USFWS 2011, pp. C-20 to C-28). We then used these physical and biological features of nesting, roosting, and foraging habitats to create a*

[7] Federal Register / Vol. 77, No. 46 / Thursday, March 8, 2012

rangewide map of (relative) habitat suitability (MaxEnt) (Phillips et al. 2006, entire; Phillips and Dudik 2008, entire). In addition to providing a map of relative habitat suitability, this process allowed us to evaluate an area's suitability and determine whether the presence of the species was likely based on an assessment of known species-habitat relationships."

In this step, they are referring to the MaxEnt process described earlier in these comments. The description in Step 1 above is misrepresents what the USFWS modeling team did and what the results of the MaxEnt support.

r. *"At the outset, the attributes of forest composition and structure and characteristics of the physical environment associated with nesting, roosting, and foraging habitat—physical and biological features used by the species—were identified based on the habitat selection exhibited by nearly 4,000 known owl pairs (USFWS 2011, pp. C-20 to C-28)."*

MaxEnt did not identify the physical and biological features used by the species, as the USFWS claims here. In reality, the USFWS created a list of habitat definitions it felt might describe the physical and biological features and inputted these into MaxEnt. The assertion here by the USFWS that MaxEnt somehow identified the "*physical environment associated with nesting, roosting, and foraging habitat"* is totally and equivocally incorrect. In reality, MaxEnt provides no scientific support for the PCEs described in the proposed revision that are incorporated in the MaxEnt process such as *"[M]ean tree size greater than 16.5 in (42 cm) quadratic mean diameter*." The proposal cites no other scientific basis for using this criterion to define PCEs. Other PCEs not represented in the MaxEnt model are based on professional judgment and not supported by the modeling effort at all.

s. *"In addition to providing a map of relative habitat suitability, this process allowed us to evaluate an area's suitability and determine whether the presence of the species was likely based on an assessment of known species-habitat relationships."*

These conclusions are not supported by the process referenced in Appendix C. MaxEnt does not "*evaluate an area's suitability*" but rather ranks all of the pixels in an area based on the "*best*" habitat definition supplied to it. As stated before, even if none of the areas are suitable, MaxEnt would still provide a relative ranking implies that some are better than others. MaxEnt does nothing to support the notion that the habitat definitions it was given by USFWS actually define the nesting, roosting and

foraging habitats needed by the spotted owl or the PCEs. It also does not produce a map that predicts the "*presence of the species"* as described below.

t. Recently, there have been a number of studies (Royle et al. and Torres et al.) that put into question the validity of the use of MaxEnt.[8] [9] We enlisted the assistance of statisticians from WEST, Inc. to conduct an analysis of the MaxEnt model to see if the concerns raised by Royle et al. and Torres et al. existed in the USFWS application of it. (Appendix B.) Manly and Merrill replicated the MaxEnt output using data provided by the USFWS and then analyzed these as done by Royle. They concluded:

> *"Based on the results in the Royle et al. (2012) and Torres et al. (2012) papers and the differences that we find between MaxEnt and maximum likelihood estimation applied to the U.S. Fish and Wildlife Service data from the Southern Western Cascades and Klamath East we believe that the results obtained from a MaxEnt analysis may be misleading for habitat modeling in general, and are unreliable with habitat modeling for northern spotted owls in particular. Also, as the U.S, Fish and Wildlife Service analysis used the output from MaxEnt for further analyses using the Zonation and Hexsim programs we believe that the results from these further analyses are also not reliable."*

u. In summary, the first three steps of the process used to define the areas proposed for critical habitat definition are incapable of identifying what physical and biological features are essential for the conservation of the species, and furthermore are incapable of determining what areas within the 24 million acres within the range of the spotted owl contain those features. This defects starts with the hypothetical vegetation layer USFWS use as the basis of the whole process. This layer does not represent what is actually on the ground, and there is a virtually zero probability that what GNN-LT predicts is the actual condition on the ground in light of a multitude of characteristics in the habitat definitions used by MaxEnt. Therefore, any output from MaxEnt or other models relying on it (Zonation and HabSim) are not applicable to the real landscape as it exists on the ground. The USFWS cannot show that the almost 14 million acres identified as being essential for the conservation of the species actually

[8] J. Andrew Royle, Richard B. Chandler, Charles Yackulic and James D. Nichols (2012) Likelihood analysis of species occurrence probability from presence-only data for modelling species distributions. British Ecological Society, Methods in Ecology and Evolution

[9] Natalia M. Torres, Paulo De Marco Junior, Thiago Santos, Leandro Silveira, Anah T. de Almeida Jacomo and Jose´ A. F. Diniz-Filho (2012) Can species distribution modelling provide estimates of population densities? A case study with jaguars in the Neotropics. Diversity and Distributions, 18, 615–627

contain the PCEs they say are needed. The standards dictated by the ESA require that the USFWS cannot use faulty computer simulations of a hypothetical landscape as the basis for designating critical habitat.

Step 4. Use the Output of MaxEnt to Run the Zonation Model

a. Because the USFWS wanted to create a network of habitat conservation areas, and the output of MaxEnt "*consists of finely-distributed patterns*" of relative habitat suitability, they ran the MaxEnt output through another model called Zonation. All the errors associated with GNN-LT, the conglomeration process and MaxEnt became inputs to Zonation, further compounding the total error.

b. As with MaxEnt, the USFWS used the Zonation model for purposes it was not designed for. The authors o*f Zonation clearly state that the model* is not designed to develop a conservation network, yet that is exactly how the USFWS used it.

> *"The purpose is not necessarily to produce a detailed conservation plan for a large region, but to identify priority areas of the landscape that could be subjected for more detailed analysis and planning that accounts for other land-use pressures than nature conservation."*[10]

The USFWS modeling team also warned against the use of Zonation outputs to define specific conservation areas (i.e. critical habitat blocks).

> *"Also, it is important to recognize these scenarios are not recommendations for the specific size or location of habitat conservation blocks – they are only scenarios for the purpose of comparing to other scenarios to evaluate how they influence spotted owl population performance in the population simulation model." "These depictions are for demonstrative purposes only, not recommendations. They are essentially asking what would be the conservation value to spotted owls if habitat conservation areas were restricted to various land ownership categories."* [4]

Despite the caveats made by the authors of the Zonation model and those of the USFWS modeling team, the USFWS used the outputs of the Zonation model to delineate different groupings of areas for potential designation as critical habitat, all of which were by definition supposed to be "*essential for the conservation of the species*" when in fact the model does not make that judgment.

[10] Moilanen, A., and H. Kujala. 2008. The Zonation conservation planning framework and software v.2.0: user manual

c. Zonation also further blurs the line between what is actually on the ground and what it depicts as being on the ground. Zonation does not utilize the presence or absence of the PCEs identified by the USFWS as its input. It takes the relative habitat suitability index of the MaxEnt model (which in itself does not depict the presence or absence of PCEs in a area) and further smoothed these by assigning a new value to the pixel ("*habitat value*") which is "*a function of its "base" value (i.e., its RHS value) as well as the value of the cells surrounding it*." The USFWS modeling team describes it as follows.

> *"Thus, two cells of identical RHS may have different habitat value depending on how many other high, medium, and low value cells are nearby. The term habitat value therefore incorporates a larger spatial context than does RHS."*

Zonation then further smoothes these new habitat values with its "*Distribution Smoothing*" function. The USFWS determined that this smoothing of the new habitat value should be done at the home range size of 3,424 acres.

> *"The user specifies the area or "smoothing kernel" within which Zonation averages or smooths habitat values…" "Given that we are estimating habitat conservation network scenarios at relatively large scales, the coarser-grained (home range derived kernel values) maps provided more discrete areas as* ***estimated*** *networks, and thus we used the home range scale kernel size."*

The result of all of the smoothing done at the different stages of the process can be seen below. All of these stands shown are in the critical habitat proposal and are all supposed to contain PCEs, yet they clearly do not.

Because of all of the smoothing done throughout the MaxEnt and Zonation processes coupled with how the base GNN vegetation layer was created, the claim by the USFWS that the areas represented by the different Zonation scenarios contain PCEs is baseless. It is also untrue that the networks created by Zonation somehow show that these areas are essential for the conservation of the species as claimed by the USFWS.

Below is a picture of the actual stands that exist within a portion of the proposed revision of critical habitat. It is easy to see that many of these stands do not contain the PCEs but because of the smoothing process all real stand delineations are lost.

d. What Zonation actually does is determine how little land is required to "*capture*" XX% of the habitat values based on the parameters provided to it by the USFWS. It does this by removing the areas with the lowest habitat values first until the specified percentage of the habitat values are left. The USFWS used Zonation solutions that captured 30%, 50% and 70% of the total habitat values as reference points. Again, there is no way to determine if the areas captured by these solutions actually contain the PCEs identified by the USFWS.

e. The USFWS used Zonation outputs that captured 70% of the habitat values as the basis for the proposed revision of critical habitat. This in no way supports the premise that these areas are essential for the conservation of the species. All it shows is a computer's calculation of the minimum amount of land needed to encompass 70% of the habitat value which is a purely artificial data point created from smoothed indices of a relative habitat suitability index based on biased spotted owl locations overlaid on a hypothetical landscape using conglomerated data. USFWS never conducted any on-the-ground validation of its multi-stage model, and has no idea how

accurate the model is in predicting use by spotted owls. No matter how elegant a model may be, if it cannot be shown to accurately predict anything, it has no scientific value and cannot be used for an ESA critical habitat designation. USFWS should ground-verify the multi-stage model before proceeding to make a final critical habitat determination.

Step 5. Develop a Spotted Owl Population Model

a. Here is how the USFWS modeling team describes this step.

> *"Develop a spatially explicit spotted owl population model that reliably predicts relative responses of spotted owls to environmental conditions, and use it to test the effectiveness of habitat conservation network scenarios designed in step 2 in recovering the spotted owl.* ***The simulations from this spotted owl population model are not meant to be precise estimates of what will occur in the future, but provide information on comparative trends predicted to occur under differing habitat conservation scenarios****."*[4]

b. Here is how the USFWS depicts this step in its proposed revision document.

> *"In the last step, we determined where the physical and biological features, as well as unoccupied areas, are essential to the conservation of the species. To do this we used a spatially-explicit northern spotted owl population model (HexSim) (Schumaker 2008, entire) to predict relative responses of northern spotted owl populations to different habitat network designs, and evaluated these responses against the recovery objectives and criteria for the northern spotted owl using a rule set based on those criteria."*[6]

c. The USFWS misdescribes what its modeling team did, as seen above. Their first claim, *"..we determined where the physical and biological features, as well as unoccupied areas, are essential to the conservation of the species"* is not possible in this step because the input used in the HexSim model does not contain the physical and biological features identified as PCEs, as we have shown above. The input to HexSim is a map that captures a pre-determined percentage of the "*habitat values*" created by the Zonation model, which are smoothed "*relative habitat suitability values*" of the already smoothed relative habitat suitability values created by MaxEnt, which are mere indices of potential presence created by overlaying spotted owl locations from 1993-1999 on a hypothetical landscape created by the GNN-LT model, which is based on radiation bands collected from space. Since there is no way to link the habitat selected in the various Zonation scenarios to the PCEs necessary for critical habitat designation, this first claim is incorrect. In addition to

this, the USFWS modeling team was very clear that the scenarios created by Zonation can only be used to compare between scenarios and are not "*precise estimate*s"; therefore using this input into the HexSim model in no way confirms that these areas are essential for the conservation of the species.

d. The second claim, that HexSim then "*evaluated these responses against the recovery objectives and criteria for the northern spotted owl using a rule set based on those criteria"* is also unfounded. This is another description of what the USFWS claims the HexSim modeling did.

> *"In developing this proposed rulemaking, we used this spotted owl population simulation model to compare alternative critical habitat networks and evaluate each design's ability to meet the recovery goals and criteria for the northern spotted owl." "This step of the process enabled us to determine the amount and configuration of physical or biological features on the landscape that are essential to the conservation of the owl. It also helped us to determine which unoccupied areas are essential to the conservation of the species. By evaluating spotted owl population metrics such as relative population size, population trend, and extinction risk that resulted from each scenario evaluated, we believe we are proposing the most efficient habitat network to conserve the northern spotted owl…"*[6]

e. The USFWS used the "*relative population size, population trend, and extinction risk that resulted from each scenario evaluated"* as being absolute values, which they then compared to the recovery objectives in the final revised Recovery Plan. Yet the USFWS modeling team explicitly states that these models cannot be used for this purpose. The outputs of the HexSim model can only be used to compare between its different scenarios. "***The simulations from this spotted owl population model are not meant to be precise estimates of what will occur in the future, but provide information on comparative trends predicted to occur under differing habitat conservation scenarios.****"*[4] The USFWS did what its modeling team says should not be done with the HexSim results: it used the outputs of the model as "*precise estimates*" of what the outcomes of implementing the various HexSim scenarios would actually be on the ground. The process used is incapable of providing the data necessary to conduct the comparison between recovery objectives and the implementation of the networks evaluated by HexSim.

In fact, no one to date has been able to build a population model that accomplished what the USFWS erroneously claims that HexSim did, [9] that is, create a model that can actually predict spotted owl population trends. This is not for lack of trying. Many capable researchers have tried, and millions of dollars have been spent, and none have been successful. The latest and by far the most extensive in terms of person hours and money dedicated to it was undertaken by the USDA Pacific Northwest Research Station under the auspices of the NWFP Regional Ecosystem Office as part of the NWFP monitoring effort.[11] After over a decade of work, they abandoned the effort to build such a predictive model and concluded:

> "[*T*]*o date, attempts to develop predictive models have had mixed results (Dugger et al. 2005, Franklin et al. 2000, Olson et al. 2004) and have* ***generally been unsuccessful across the range of the owl****…"*

This is why the USFWS modeling team made it very clear that the results of the HexSim modeling effort could not be used to predict what would happen in the future, but rather could only be used to rate the relative differences between alternatives. Yet USFWS disregarded the modelers' warning and used HexSim to predict what would happen in the future.

f. The USFWS also made a series of modifications to the input variables given to HexSim to produce a number of "*composites.*" USFWS chose the last of these (Composite 7) as the proposed revision of critical habitat. While the USFWS cannot support the claim that the areas encompassed by the composites contain the PCEs and that these areas are "*essential*," the USFWS also does not show that there is any statistical difference between the different Composites. In fact, they might all share the same mean within their respective standard deviations, meaning that there may not be any difference between Composites 1-7. This is also true for the one that represents the NWFP and the current designation of critical habitat. By only displaying the mean values, USFWS creates a false appearance that the difference between these alternatives is real. USFWS also does not show that the differences displayed lead to any real difference in achieving the recovery objectives. They

[11] **Davis, Raymond J.; Dugger, Katie M.; Mohoric, Shawne; Evers, Louisa; Aney, William C. 2011.** Northwest Forest Plan—the first 15 years (1994–2008): status and trends of northern spotted owl populations and habitats. Gen. Tech. Rep. PNWGTR- 850. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 147 p.

merely state it as a matter of fact. This misuse of the modeling data and results is not the best available science, and cannot justify a critical habitat designation.

g. Other major flaws in the HexSim modeling step are that habitat is held constant for the 350 year time period used by it and any area with an RHS value less than 35 is assumed to be non-habitat. Assuming no change in a forest over 350 years defies common knowledge and lacks a scientific basis. As shown above, an area can have an RHS less than 35 and still be suitable owl habitat. These two combined simplifications render the use of HexSim for a critical habitat designation arbitrary and unlawful. USFWS also misrepresents what its modeling team did. The modeling team is clear that the outputs of the model can only be used to look at the relative differences between scenarios. However, when the USFWS describes how the Composite scenarios evolved, they used the HexSim population outputs as one of their main criteria. While the HexSim outputs may show one Composite score higher, this difference was not shown to have statistical significance, and should not have been given an important role in selecting the proposed critical habitat network. The HexSim values are all relative values not absolute ones.

h. By holding habitat constant and not allowing habitat to grow, the USFWS greatly overestimates the amount of land needed to reach relative population levels. In the real world, trees grow and areas that are not currently supporting spotted owls will be capable of doing so in the future (at least if the barred owl population is controlled). The USFWS appears to be using a double standard in regard to areas currently classified by MaxEnt as having low RHS values. In the modeling process they are excluded from the model and not allowed to grow into habitat. Yet, USFWS includes these areas as critical habitat claiming they are essential for the conservation of the species.

> *"Therefore, portions of the habitat mosaic in some subunits proposed for designation within the geographical area occupied by the species at the time of listing consist of younger and/or partially-harvested forest but are essential to conservation of the species because they are capable of developing the PCEs that support nesting, roosting, or foraging by spotted owls that will be necessary for population expansion."*

The USFWS does not explain how it can justify the inclusion of areas that are considered not to be suitable habitat when the models they rely on to substantiate

their "*essential to the conservation of the species*" claim do not consider them, and they are not allowed to grow into having the PCEs mentioned above.

3. MaxEnt Output May Not Depict Factors that Account For Owl Population Performance

As Dr. Irwin of NACSI observes, "*The Service assumed that output from a species-distribution model, MaxEnt, would incorporate the best environmental conditions that affect the Spotted Owl's overall health and fitness, that is, population performance. If that assumption is correct, MaxEnt output can be considered useful for assisting in identifying priority conservation units—in this case, Critical Habitat. If that assumption is not correct, appropriate caution should be exercised in using MaxEnt output to inform such management decisions. We had access to datasets, the analysis of which suggested that the assumption is invalid: (1) the demographic study from 1992-1996 near Springfield, Oregon; and (2) demographic data collected from 1990 through 2003 along the eastern slopes of the Cascades in Washington.*

If MaxEnt relative habitat suitability (RHS) values are truly related to NSO population performance, a reasonably strong pattern of increasing rate of occupancy and reproductive success by owl pairs with increasing RHS values would be expected. ***However, we found no strong relationship between RHS values and the number of years that sites were occupied by NSOs or with average reproductive rates*** *for our western Oregon study area. Similarly, we could not demonstrate that MaxEnt RHS values were correlated with average annual reproductive success for NSOs in the eastern Washington Cascades study area. In fact, owl pairs at sites with high RHS values in that study area generally exhibited reduced reproductive rates. Also, reproductive rates for owls at sites with relatively low RHS values, not considered "suitable" for owls by HexSim modeling, exhibited occupancy- and reproductive rates as high or higher than those owls at sites with high RHS values. These results are not expected if RHS is to be considered reliable for identifying high-quality habitats or "good" owl sites. These analyses, which are supported by recent literature, raise concerns about the overall utility of MaxEnt to provide input for models that predict future populations and identify Critical Habitat for Northern Spotted Owls."* Appendix A

4. Failure to Show that Spotted Owl Conservation is Possible

Another shortcoming of the process used by the USFWS to delineate areas essential for the conservation of the species is that the USFWS fails to show that any of the scenarios will actually lead to the conservation of the species. For something to be essential to the conservation of the species it must be shown that conservation is actually possible. The USFWS defines conservation as:

> *"Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary."*[6]

With this definition in mind, USFWS must show that maintaining the proposed critical habitat network could lead to the delisting of the spotted owl. They have failed to do so, cannot do so due to ongoing displacement of spotted owls by barred owls, and therefore they cannot substantiate that the areas delineated in the proposed revision are "*essential*" to conservation. In fact, even the HexSim models show that under the best case scenario where barred owls are rapidly displacing spotted owl, there is no habitat conservation network large enough that will lead to a stable or increasing population. Without a reduction in the barred owl population, the spotted owl population will continue to decline no matter how much land is designated as critical habitat. The USFWS recently published a Draft EIS to support the experimental removal of barred owl. This states:

> "[*W*]*ithout management intervention, it is reasonable to expect that competition from barred owls may cause extirpation of the northern spotted owl from all or a substantial portion of its historical range, reducing its potential for recovery."*[12]
>
> *"Although northern spotted owl populations have been declining for many years, the presence of barred owls exacerbates the decline and now is more strongly correlated with spotted owl population trends than the presence of protected habitat. This could result in the extirpation (local extinction) or near extirpation of the northern spotted owl from a substantial portion of their historical range, even if other known threats, such as habitat loss, continue to be addressed."*[13] *"It is reasonable to assume that with no action, barred owls would continue to increase on most areas with and spotted owl populations would continue to decline."*[10]

[12] **Federal Register** / Vol. 77, No. 46 / Thursday, March 8, 2012

[13] USDI USFS Experimental Removal of Barred Owls to Benefit Threatened Northern Spotted Owls Draft EIS March 2012

One of the stated "*needs*" of doing this experimental removal is to *"[E]valuate whether barred owls can be effectively removed from an area and how much follow-up effort is required to maintain low population levels of barred owls."* Until this work is completed and the USFWS determines if barred owl populations can be reduced and controlled, the USFWS cannot say that any revision of critical habitat is needed since without the removal of barred owls "… *barred owls may cause extirpation of the northern spotted owl from all or a substantial portion of its historical range, reducing its potential for recovery."* If a species cannot be "*conserved*" then there are no actions "*essential*" for its conservation.

We have shown that the process used by the USFWS to identify areas that contain those physical or biological features essential to the conservation of the species is incapable of doing so. Since there are four distinct computer models used in tandem, the errors created by the first are carried over and compounded in the second which is carried over and compounded to the third and finally the fourth. None of these errors is acknowledged or displayed by the USFWS but by the end of the process the errors are so great as to render the conclusions meaningless. The fundamental problem with the process is that it starts with a hypothetical vegetation layer which is then replaced by various indices (conglomerates, RHS and habitat values) thus losing any connection with what exists on the ground, thus eliminating any support for the assertion that these lands contain the primary constituent elements necessary for inclusion in critical habitat. The USFWS failed to substantiate its claim that the areas they have proposed are essential to the conservation of the species. Since the process used by the USFWS is incapable of identifying areas that contain those physical or biological features essential to the conservation of the species, the USFWS must abandoned this effort and develop a new process that can.

5. Areas That Do Not "Require Special Management Considerations or Protection."

Most of the federal lands in the proposed revision of critical habitat are currently being managed under Northwest Forest Plan land use allocations that provide ample management protection for the northern spotted owl as well as meeting other wildlife and ecological objectives. As long as the Northwest Forest Plan remains in effect on these lands, they do not "*require special management considerations or protection*" and are therefore ineligible for designation. Should the Northwest Forest Plan be amended or

revised in the future over some or all of its geographic range, USFWS can consider at that time whether to designate any additional areas as spotted owl critical habitat. The USFWS states that of the 11,008,230 acres of proposed critical habitat on land managed by the Forest Service and BLM, only 3,138,411 acres are NOT in areas that are in some sort of reserve land use allocation category.

> *"The second step is to filter reserved Federal lands where the objectives of the allocation are consistent with proposed critical habitat objectives. For the purposes of this analysis, all Federal lands currently protected or managed under conservation objectives for the benefit of the NSO are considered to be "reserved" lands. These include Congressionally Reserved Areas, LSRs, and Riparian Reserves. Management guidelines for Congressionally Reserved Areas are considered by the Service to be more conservative than those that could be implemented under critical habitat. Furthermore, under the NWFP, BLM and USFS timber harvest practices on LSRs are consistent with proposed critical habitat objectives as these lands are currently being managed for the benefit of the NSO and other species associated with old growth. The NWFP also restricts or limits timber harvest on Riparian Reserves, consistent with proposed critical habitat objectives. Therefore, reserved lands are not likely to experience any changes in proposed timber management as a result of critical habitat designation. There are approximately 8,882,712 acres of Federal reserved lands.*[14]

Because these 8,882,712 acres are already being managed under stricter guidelines that those required by critical habitat designation, they are not eligible for designation. The USFWS recognizes the fact that the NWFP management requirements are adequate to conserve the spotted owl in other documents but fails to do so in the proposed revisions of critical habitat.

> *"While reasonable and prudent alternatives could substantially change a proposed project and affect the economic gains from a timber project, a determination that a project would result in jeopardy or adverse modification with respect to spotted owls is an extremely rare event because:* ***(1) the NWFP generally guides the development of Bureau of Land Management (BLM) and Forest Service actions in a manner that considers the conservation needs of the spotted owl…"***
>
> *"Thus, in areas where northern spotted owls occur, which includes most areas within units of the proposed revised critical habitat rule, Federal agencies such as the Forest Service and BLM are already consulting with the Service on the*

[14] Industrial Economics, Incorporated ECONOMIC ANALYSIS OFCRITICAL HABITAT DESIGNATIONFOR THE NORTHERN SPOTTED OWL, May 29, 2012

potential effects of their proposed actions, regardless of whether these lands are currently designated as critical habitat."[15]

"Therefore, reserved lands are not likely to experience any changes in proposed land management as a result of critical habitat designation."[15]

"In 1994, in its biological opinion on the NWFP, the Service concluded that the NWFP met or exceeded the standards expected for the Federal contribution to recovery of the spotted owl."[16]

6. Primary Constituent Elements too Broad to be Meaningful

The Primary Constituent Elements (PCEs) identified are so broad as to include the entire forested area within the range of the spotted owl. Since the USFWS asserts that only two of the PCEs need to be present in order for a piece of land to be classified as "*essential to the conservation of the species*" (the first plus one other) virtually all of the forest areas within the 24 million acre range qualify. The first and fourth PCEs are described as:

(1) Forest types that may be in early-, mid-, or late-seral stages and that support the northern spotted owl across its geographical range; these forest types are primarily:

(a) Sitka spruce,

(b) Western hemlock,

(c) Mixed conifer and mixed evergreen,

(d) Grand fir,

(e) Pacific silver fir,

(f) Douglas-fir,

(g) White fir,

(h) Shasta red fir,

(i) Redwood/Douglas-fir (in coastal California and southwestern Oregon), and

(j) The moist end of the ponderosa pine coniferous forests zones at elevations up to approximately 3,000 ft (900 m) near the northern edge of the range and up to approximately 6,000 ft (1,800 m) at the southern edge.

…

[15] USDI, USFWS - Draft Environmental Assessment: Designation of Critical Habitat for the Northern Spotted Owl (June 4, 2012)

[16] U.S. Fish and Wildlife Service. 2011. Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*).

(4) Habitat to support the transience and colonization phases of dispersal, which in all cases would optimally be composed of nesting, roosting, or foraging habitat (PCEs (2) or (3)), but which may also be composed of other forest types that occur between larger blocks of nesting, roosting, and foraging habitat.

The combination of these two overly broad PCEs qualify the vast majority of forest land within the 24 million acre range of the spotted owl as essential for the conservation of the species. The only reason that all of them are not included is that the USFWS defined the proposed revision as a network that would "*...achieve the greatest relative conservation and recovery goals for the northern spotted owl but simultaneously minimize effects to other land and resource uses…*"[17]

These two PCEs lack the specificity needed to discriminate between what forested lands are essential and what is not, as all forested land meet these qualifications. There is no scientific support that justifies such broad definitions as PCEs. It is a gross misrepresentation of the language and intent of the ESA to assume that most of the forested land within the spotted owls range is "*essential for the conservation of the species*."

7. Comparison of the Proposal to Revise Critical Habitat with Other Evaluations

A. MaxEnt vs. Alternative Methods for Predicting NSO Distributions--A Test of Critical Habitat Models Using the Relative Frequency Function (RFF) Tool. (Appendix A)

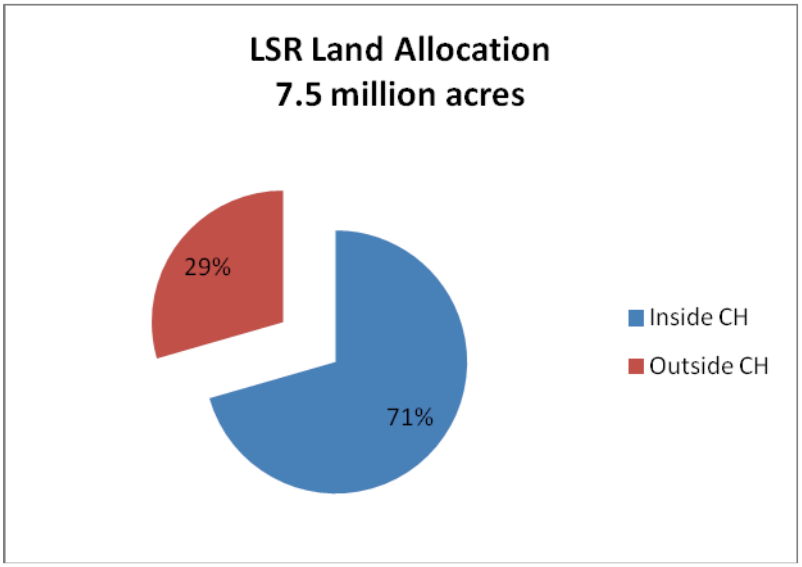
"The purpose of this analysis was to replicate the Service's MaxEnt habitat suitability analysis using an independent method. The RFF tool, developed by Loehle (2012), was used for this purpose. In all 11 regions the RFF model obtained a good solution (between 75% and 88% accuracy) with 3 to 5 variables. These models were much more parsimonious than for the MaxEnt models, perhaps because in the Service's analysis in Appendix C the core nest- and roosting site (i.e., NR) variables were forced into the model a priori. The lack of parsimony means that some of the variables are correlated with each other and/or that variables with marginal significance were forced into the model. In our analyses NR variables had the most influence in 6 of the 11 models and didn't enter models for OCR and KLE. In contrast with the MaxEnt results, no forest composition variables entered any model, perhaps because composition covaried with variables like elevation or canopy cover, or because in the RFF analysis more than a single structure variable could enter the model at multiple scales."

[17] USDI, USFWS - Draft Environmental Assessment: Designation of Critical Habitat for the Northern Spotted Owl (June 4, 2012)

"This means that the variables in the MaxEnt models may not necessarily be predictive and therefore cannot necessarily be interpreted as indicative of NSO habitat."

B. NWFP Land Use Allocations

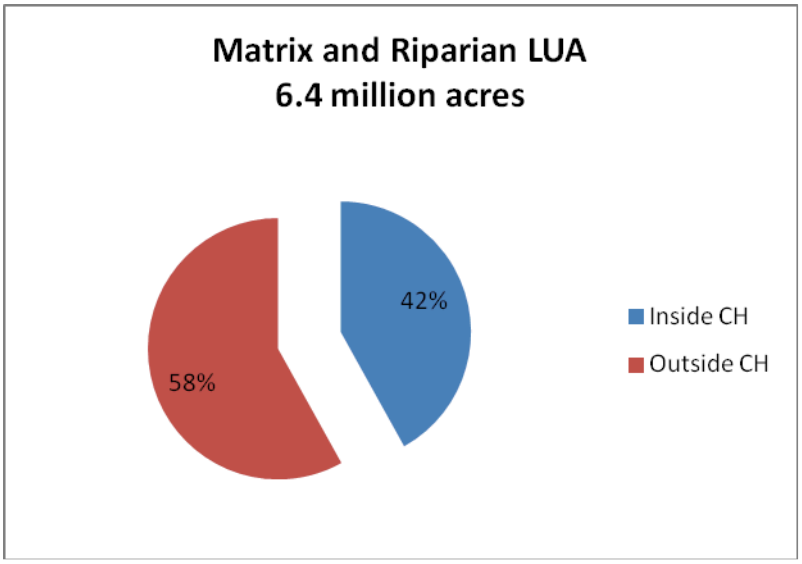
In 1994, the USFS and BLM adopted the Northwest Forest Plan (NWFP) for the sole purpose of providing enough habitat for the spotted owl so that it would eventually recover. Over 90% of the land was taken out of production which resulted in a commensurate reduction in timber sales. As a result, hundreds of mills were shut down and thousands lost their jobs. In their latest comprehensive Status Review, the USFWS confirmed the continued validity of the NWFP. [1] Because of the faulty process used in developing the proposed revisions to critical habitat, the models only included 71% of the 7.5 million acres LSR system. The 2.2 million acres of LSR's outside of the proposed revisions are assumed by the USFWS to have no contribution to spotted owl persistence and are treated as non-habitat by their models.



On the opposite side, the lands allocated to the matrix and riparian land use allocations were assumed in the NWFP to not contribute anything to the

[1] Courtney, S.P., J.A. Blakesley, R.E. Bigley, M.L. Cody, J.P. Dumbacher, R.C. Fleischer, A.B. Franklin, J.F. Franklin, R.J. Gutiérrez, J.M. Marzluff, and L. Sztukowski. 2004. Scientific evaluation of the status of the northern spotted owl. Sustainable Ecosystems Institute, Portland, Oregon.

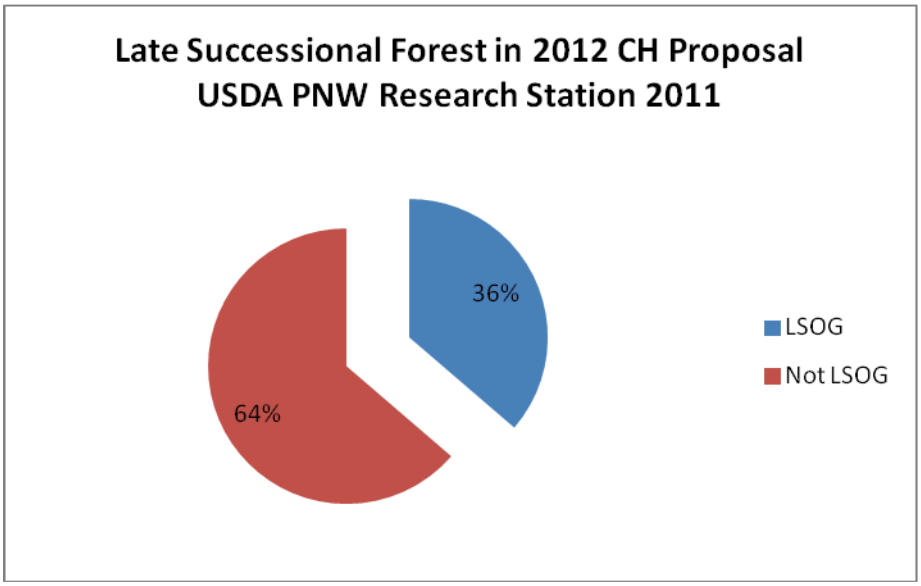
persistence of the spotted owl and were actually the residual areas left after all other land allocations were made to protect the owl. Again, the faulty process used in developing the proposed revisions to critical habitat includes 2.7 million acres of these lands that have heretofore been looked at as not being needed for the recovery of the spotted owl.



C. Late Successional Old Growth Forest

The spotted owl was listed as a threatened species based on the hypothesis that it required late succssional old growth forests and that the amount of this type of forest had been drastically reduced due to timeber harvest. Even today, many proclaim that the spotted owl requires late successional old growth forests. In 2011, the USDA Pacific Northwest Research Station undated what they considered to be "*old growth forests*" in their 15 year monitoring report.[2] Overlaying the 2012 SO Critical Habitat proposal on these categories show that according to the PNW Research Station, only 36% of the proposed critical habitat is comprised of late successional old growth forest.

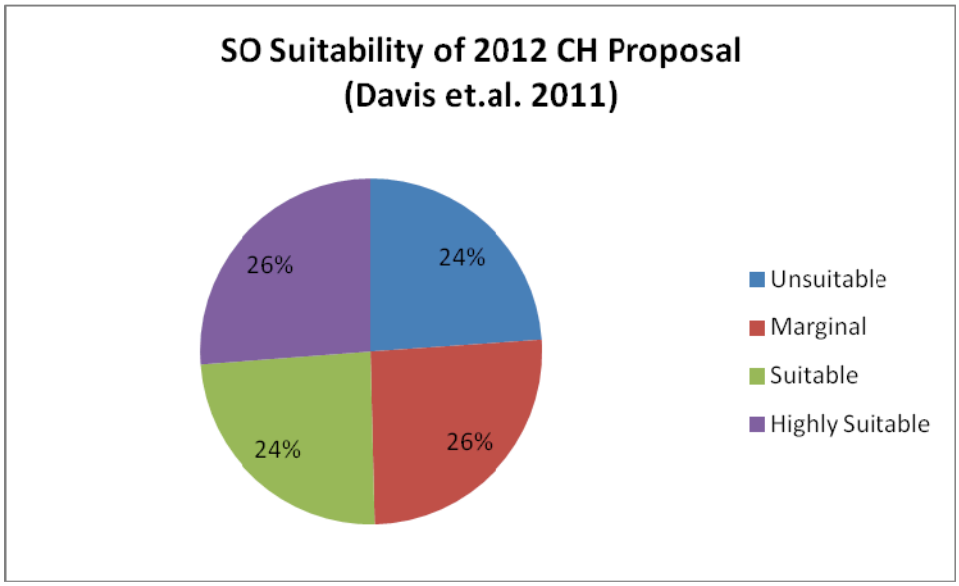
[2] **Moeur, Melinda; Ohmann, Janet L.; Kennedy, Robert E.; Cohen, Warren B.; Gregory, Matthew J.; Yang, Zhiqiang; Roberts, Heather M.; Spies, Thomas A.; Fiorella, Maria. 2011.** Northwest Forest Plan–the first 15 years (1994–2008): status and trends of late-successional and old-growth forests. Gen. Tech. Rep. PNW-GTR-853. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 48 p.



D. Suitable Spotted Owl Habitat

In 2011, the USDA Pacific Northwest Research Station published a 15 year monitoring report on the status and trends of the northern spotted owl.[3] Davis et.al. used the same base data as the USFWS in their current critical habitat proposal to identify what they considered to be spotted owl habitat. They allocated habitat into four categories, unsuitable, marginal, suitable and highly suitable. Overlaying the 2012 SO Critical Habitat proposal on these categories show that according to Davis, et.al, 50% of the lands identified by the USFWS as being "*essential to the conservation of the species*" are either unsuitable or marginal habitat. Only 24% of the acres are classified as "*highly suitable*."

[3] **Davis, Raymond J.; Dugger, Katie M.; Mohoric, Shawne; Evers, Louisa; Aney, William C. 2011.** Northwest Forest Plan—the first 15 years (1994–2008): status and trends of northern spotted owl populations and habitats. Gen. Tech. Rep. PNWGTR-850. Portland, OR: U.S. Department of Agriculture, Forest Service, PacificNorthwest Research Station. 147 p.



E. Nesting, Roosting and Foraging Habitat Definitions

The process used by the USWFS to define what constitutes nesting, roosting and foraging habitats in the proposed revisions produced results with staggering differences compared to historic definitions. Not only are they totally different from what has been viewed as valid definitions for almost 20 years but they are also totally unrecognizable on the ground for anyone trying to ground truth them. Past definitions were predominately fashioned from the following.

> *"Spotted owls generally rely on older forested habitats because such forests contain the structures and characteristics required for nesting, roosting, and foraging. Features that support nesting and roosting typically include a moderate to high canopy closure (60 to 90 percent); a multi-layered, multi-species canopy with large overstory trees (with diameter at breast height [dbh] of greater than 30 inches); a high incidence of large trees with various deformities (large cavities, broken tops, mistletoe infections, and other evidence of decadence); large snags; large accumulations of fallen trees and other woody debris on the ground; and sufficient open space below the canopy for spotted owls to fly (Thomas et al.1990)."*

All of the forest characteristics are easily identifiable to anyone on the ground assessing owl habitat suitability. The proposal to revise critical habitat utilizes habitat definitions derived from analysis of the hypothetical GNN-LT vegetation layer coupled with abiotic factors. Thus, all eleven modeling regions have different definitions and none of these are identifiable on the ground. For

example, the habitat definition for the Oregon Coast Ranges Modeling Region (an area that is itself very hard to delineate on the ground) is:

CANCOV_CON (≥55) - Canopy cover of all conifers greater than 55 cm dbh
+ DDI (≥6) - Diameter diversity index is greater than or equal to 6 (structural diversity within a stand, based on tree densities within different DBH classes)
+ TPH_GE75 (≥20) - At least 20 live trees per hectare greater than or equal to 75 cm DBH
+ NR08 EDGE – The amount of edge around NR08 (above)
+ SLOPE POSITION – What part of the slope the pixel is in
+ JULY MAX TEMP – The average July maximum temperature
+ JANUARY MIN TEMP – The average minimum January temperature
+ DDI (≥4) - Diameter diversity index is greater than or equal to 4
+ TPH_GE50 (≥30) - At least 30 live trees per hectare greater than or equal to 50 cm DBH
+ CURVATURE – Undefined in the documentation
+ INSOLATION - Undefined in the documentation
+ JULY PRECIP – The average amount of precipitation in July
+ JANUARY PRECIP – The average amount of precipitation in January
+ ELEVATION – The topographic elevation
+ NR08 CORE – The size of the core around NR08
+ NORTHERN HARDWOODS – the presence of northern hardwoods
+ EVERGREEN HARDWOODS – the presence of evergreen hardwoods

This definition is not one that can be used to delimitate stands on the ground. It only makes sense in the computer modeling virtual reality in conjunction with the hypothetical vegetative layer created by the GNN-LT computer simulation. MaxEnt does not use these definitions to identify nesting, roosting or foraging habitat, but rather assigns a value between 0-1 as its relative habitat suitability (RHS) index based on how many of the factors above are present. According to the USFWS, they are using the factors above to determine if stands contain the PCEs when in fact they do not. They are only a computer's best guess as to which of the factors provided to it describe the spotted owl training sites the modelers gave to it.

The boundaries of the proposed revision of critical habitat are impossible to identify on the ground. They will only be able to be defined by use of global positioning satellite receivers that have had the boundaries created by the Zonation computer model inputted to them. Below are a couple of pictures of such boundaries. The light green is the proposed critical habitat.

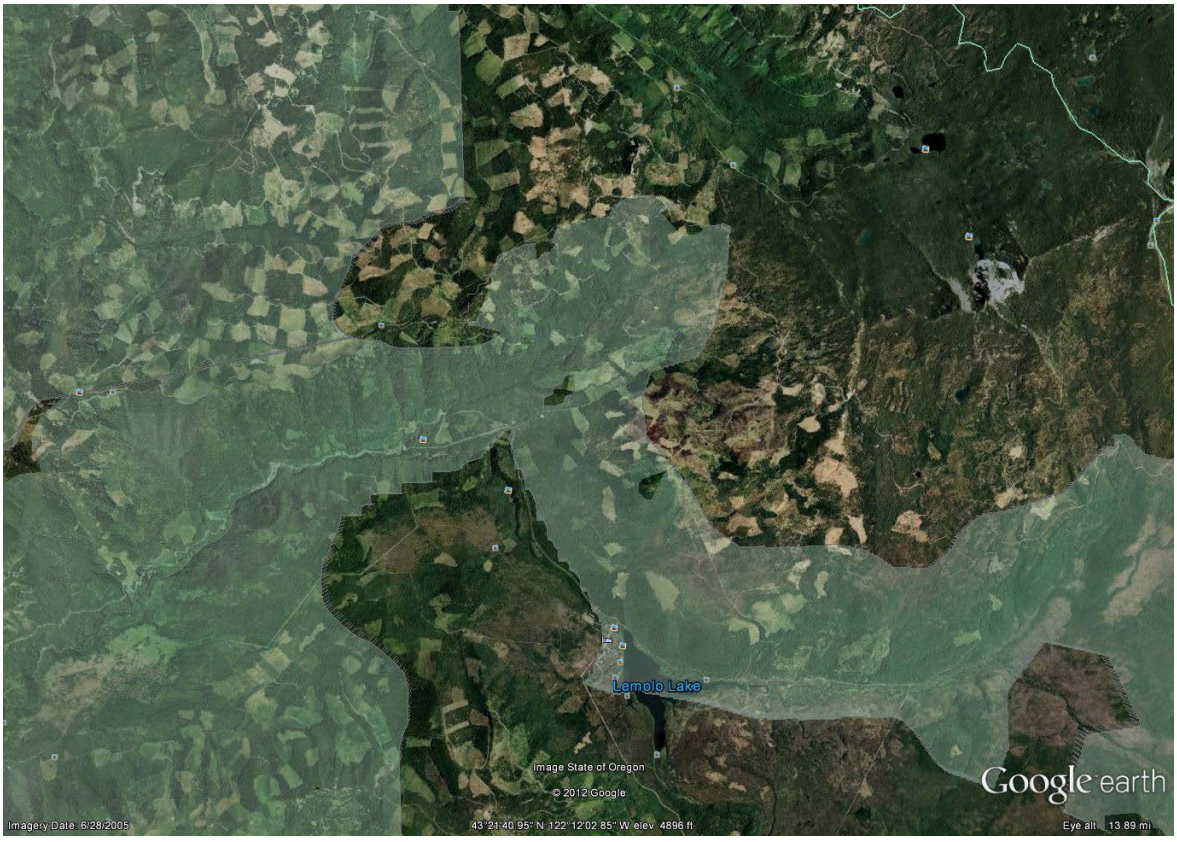

Lemolo Lake
Image State of Oregon
© 2012 Google
Google earth
Imagery Date 6/28/2005
43°21'40.95" N 122°12'02.85" W elev 4896 ft
Eye alt 13.89 mi


Image State of Oregon
© 2012 Google
Google earth
Imagery Date 8/18/2011
43°37'31.59" N 122°34'48.05" W elev 3524 ft
Eye alt 48464 ft

8. Conclusion

The proposal to revise the designated critical habitat for the northern spotted owl fails to meet the requirements of section 3(5)(A) of the ESA and accompanying regulations as the process used is incapable of determining what areas were "*occupied at the time of listing*" and/or are "*essential for the conservation of the species*." The process used by the USFWS to delineate the 13,962,449 acres proposed for critical habitat designation is incapable of distinguishing between which areas contain the physical or biological features essential for the conservation of the species and which do not. We also show that many of the proposed areas are already being managed more strictly than required by designation and therefore do not "*require special management considerations or protection"* and are not eligible for designation. Dr. Irwin of NCASI conducted several analysis of the process used by the USFWS and concluded, "[***T*]*here is a high degree of uncertainty that the combined models that underlie the proposed CH Rule accurately and reliably identified habitat that is essential for conservation throughout the range of the Northern Spotted Owl."*** Because of the fatal flaws that exist in the process used in the proposed revision of critical habitat, this process should be abandoned and a new draft proposal should be developed based only on reliable information and statistically-validated models.

Additional Legal Comments on the Proposal to Revise the Designated Critical Habitat for the Northern Spotted Owl

The critical habitat proposal is based on Section 3(5) of the ESA:

(A) The term "critical habitat" for a threatened or endangered species means- (i) the specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the provisions of section 4 of this Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of section 4 of this Act, upon a determination by the Secretary that such areas are essential for the conservation of the species.

(B) Critical habitat may be established for those species now listed as threatened or endangered species for which no critical habitat has heretofore been established as set forth in subparagraph (A) of this paragraph.

(C) Except in those circumstances determined by the Secretary, critical habitat shall not include the entire geographical area which can be occupied by the threatened or endangered species.

1. The proposed Critical Habitat Units are not "essential for the conservation of the species."

The Federal Register Notice (FRN) states:

> "*While we conclude that the vast majority of lands included in the proposed designation were occupied at the time of listing for the reasons discussed below, we also evaluated them as if they were not occupied and have tentatively determined that all of these lands are essential to the conservation of the species."* 77 Fed. Reg. 14067.

The FRN does not explain why the 13,962,449 acres of land proposed for designation as critical habitat are "*essential to the conservation of the species*." The notice states that all this land was either occupied at the time of listing or is currently occupied. 77 Fed. Reg. 14101. Yet the February 2012 Barred Owl DEIS states "[*A]pproximately 12,104,100 acres of spotted owl habitat occur within the range of the northern spotted owl*."[4] The USFWS claims it did not list every acre of occupied owl habitat. 77 Fed. Reg. 14101. Assuming that every "*suitable*" acre is included in this

[4] USDI USFS Experimental Removal of Barred Owls to Benefit Threatened Northern Spotted Owls Draft EIS March 2012 xxxii

proposal, apparently the USFWS is proposing to designate more than 1.8 million acres of land that is not currently suitable for spotted owls. As shown elsewhere in these comments, this assumption is not correct.

In fact, the record makes it clear that the proposed critical habitat is not essential to (or for) the conservation of the northern spotted owl, but rather represents one of many possible habitat networks that could lead to conservation of the NSO. The USFWS views this particular network to be more desirable for non-biological reasons than the other networks its modelers evaluated.

Dunk et al (page 1) acknowledged: *"There are likely to be multiple defensible approaches to the challenge of identifying a species' critical habitat."* Dunk et al (page 43) explains that each of the seven composites developed and analyzed by the modelers "*met the conservation objectives*" of the effort:

> *"We sought efficient potential critical habitat networks based (to the maximum extent feasible) on public lands, with a particular emphasis on Federal lands, that met the conservation objectives described in the Guiding Principles presented earlier in this document. While larger habitat networks had highest overall population performance, we were able to develop smaller, more efficient networks of critical habitat that supported similar population performance and thus meet the goal of providing for the conservation of the northern spotted owl." ... "[E]fficiency of the habitat network was one of the Service's goals. One method of evaluating efficiency is to compare habitat scenario area to owl population size."*

Insofar as the USFWS adopted an assumption that, ignoring the effects of barred owls, a network producing more than 1,250 female owls after 350 time-steps (300 years into the future) had a low likelihood of extinction, Figure 2 in Dunk et al shows that all the evaluated alternatives (including the Northwest Forest Plan) would achieve conservation of the NSO, since the poorest-performing Composite had 2,534 owls after 300 years and the NWFP had 2,088. The figure suggests that Composite 7 was the "*most efficient*" of the alternatives on an "*owls per acre*" basis.

In addition to efficiency, FRN explains that the USFWS considered another non-biological factor:

> *"We also focused on public lands to the maximum extent possible." 77 Fed. Reg.14099. Dunk et al (page 3) confirm that the Zonation model was constructed to reflect non-biological considerations: "The Zonation model used a*

hierarchical prioritization of the landscape based on relative habitat suitability and other user-specified criteria (e.g., land ownership) to develop the most efficient solutions for incorporating high value habitat."

The dictionary definition of *"essential*" is *"basic, indispensable, necessary*" (Merriam-Webster), *"completely necessary*" (MacMillan), *"absolutely necessary, extremely important*" (Oxford). The Magnuson-Stevens Act defines "*essential"* as "*necessary*" in the definition of "*essential fish habitat.*" Sec. 3(10). USFWS has never defined "*essential*" or "*essential for the conservation of the species*" in the ESA.

Under any of these meanings, any one particular configuration of habitat is not essential for conservation where other configurations of different habitat are also effective in achieving conservation. The only habitat that is "*essential for the conservation of the species*" is habitat that would have to be included in <u>any</u> habitat network that could achieve conservation. The modelers were unable to identify any such areas, and were left to "*conjecture*" that such essential areas might exist. Dunk (page 1): *"We conjecture that most rigorous alternative approaches should result in similar areas being identified as essential for the species of interest."* They never attempted to validate their conjecture.

The three-stage modeling process was designed for use in the recovery planning process, and might, if properly validated, be used to produce a habitat network for a recovery plan that federal land management agencies and others could choose to follow. But the three-stage modeling process was not designed, and is not able, to identify habitat that is "*essential for the conservation of the species*." The USFWS cannot use the three-stage modeling process to identify such essential habitat, and must instead develop a new proposal using scientifically-valid methodologies that are designed and able to identify such essential habitat.

2. The critical habitat network is based on an improper legal standard in the Revised Recovery Plan that was mistakenly derived from the National Forest Management Act rather than the ESA.

The Revised Recovery Plan (page ix) describes: "*Recovery Criterion 2 – Adequate Population Distribution: Spotted owl subpopulations within each province (i.e., recovery unit) (excluding the Willamette Valley Province) achieve viability, as informed by the HexSim population model or some other appropriate quantitative measure*."

To apply the recovery criteria, the USFWS used a "*rule set*" to develop the critical habitat proposal:

> *We used the following rule set to compare and evaluate the potential of various habitat scenarios to meet these recovery objectives and criteria for the northern spotted owl, and thus determine what is essential to the conservation of the northern spotted owl:*
>
> 1) *Ensure sufficient habitat to support population viability across the range of the Species.*
>   a. *Habitat can support an increasing or stable population trend, as measured by a population growth rate of 1.0 or greater.*
>   b. *Habitat will be sufficient to insure a low risk of extinction.*
> 2) ***Support demographically stable populations in each recovery unit.***
>   a. *Habitat can support an increasing or stable population trend in each recovery unit.*
>   b. *Habitat will be sufficient to insure a low risk of extinction in each recovery unit.*
>   c. *Conserve or enhance connectivity within and among recovery units.*
>   d. *Conserve genetic diversity.*
>   e. *Ensure sufficient spatial redundancy in critical habitat within each recovery unit.*
>   i. *Accommodate habitat disturbance due to fire, insects, disease, and catastrophic events.*
> 3) *Ensure distribution of spotted owl populations across representative habitats.*
>   a. *Maintain distribution across the full ecological gradient of the historical range.*
> 4) *Acknowledge uncertainty associated with both future habitat conditions and spotted owl population performance — including influence of barred owls, climate change, fire/disturbance risk, and demographic stochasticity — in assessment of critical habitat design.* 77 Fed. Reg. 14098.

The USFWS required its habitat networks to "*ensure that reserves would be well-distributed across the range of the owl.*" 77 Fed. Reg. 14097. Dunk et al explained (page 3): "*Zonation analyses were conducted separately for each region to ensure that habitat would be well-distributed across the range of the owl*."

These "*rules*" exceed the standard for "*conservation*" in the ESA, which, in section 3(3), defines conservation as "*methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary*." There is no ESA requirement to achieve *"population viability across the range of the species"* or to *"ensure distribution*

of spotted owl populations across representative habitats" or to *"maintain distribution across the full ecological gradient of the historical range."*

The USFWS's goal of achieving a viable, well-distributed population of northern spotted owls goes beyond the ESA to meet a standard that the Forest Service adopted for national forest lands, under the National Forest Management Act, in 1982, requiring management plans to provide for viable, well-distributed populations of some species found on national forests. 36 C.F.R. 219.19 (1982). Early spotted owl conservation plans were principally aimed at meeting this standard rather than the ESA. The Interagency Scientific Committee Report (Thomas et al.) in 1990 explained (pages 3, 4) that:

> "*The Committee has delineated and mapped network of HCAs necessary to ensure a viable, well-distributed population of owls. ... The Committee believes this conservation strategy, if faithfully implemented has a high probability of retaining viable well-distributed population of northern spotted owls over the next 100 years."*

The FEMAT Team in 1993 explicitly reported its intent of meeting the NFMA viability standard:

> *"The Team was instructed to include alternatives that range from medium to very high probability of ensuring the viability of species and that the analysis should include an assessment of current agency programs. The use of the term viability is an obvious reference to the regulations issued under the National Forest Management Act requiring that fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired nonnative vertebrate species in the planning area (36 CFR Ch II 7-1-91 Edition 219.19). The regulations also require provision for diversity of plant and animal communities and tree species id. 219.26 and 27."* FEMAT Report II-5.

The ESA does not require recovered populations to be well-distributed throughout their range. A species can meet the ESA definition of conserved without being well-distributed throughout its entire range.

The distinction between the ESA conservation standard and the NFMA-based well-distributed requirement is central to the USFWS's decision-making for the northern spotted owl. The Dunk et al paper reveals that the northern provinces are at a relatively high risk of extinction or quasi-extinction under every alternative network, while the southern provinces are at no risk of extinction under every alternative network, regardless

of the fate of the northern provinces. Dunk et al. Tables 11, 13, 15, 17, 19. These tables appear to show a strong possibility that the spotted owl can fully recover and be delisted based only on the populations in the southern provinces. Yet because the Recovery Plan calls for a viable population in every province in order to meet its well-distributed requirement, the USFWS never evaluated any alternative that was not designed to achieve a viable population in all 11 provinces. The USFWS must evaluate alternatives that achieve conservation of the owl even if they do not satisfy the NFMA-based well-distributed standard.

The FRN proposal contains a related error with respect to treating the various physiographic provinces into which spotted owl habitat has been often divided over the past quarter century as "*recovery units*." The NMFS Recovery Handbook (page 5-1.11), which USFWS has adopted, defines a recovery unit:

> *A recovery unit is a special unit of the listed entity that is geographically or otherwise identifiable and is essential to the recovery of the entire listed entity, i.e., recovery units are* ***individually necessary*** *to conserve genetic robustness, demographic robustness, important life history stages, or some other feature necessary for long-term sustainability of the* ***entire listed entity****.*

The Revised Recovery Plan asserted that these *"physiographic provinces meet the criteria for use as recovery units. The provinces collectively cover the range of the species, and each is essential for the conservation of the spotted owl* (Thomas *et al.* 1990)." The citation to Thomas *et al.* 1990 is in error. *See* Thomas *et al.* 1990 at 61-62 (explanation of physiographic provinces). The ISC explained that it "*subdivided [the owl's range] into smaller areas for practical and analytical purposes*." *Id*. at 61. The ISC Report never determined that each of its provinces is "*essential for the conservation of the spotted owl.*" That ESA standard was never part of the ISC's consideration, as the owl was not even listed when the report came out. As noted above, the ISC sought to fulfill the NFMA-based well-distributed rule, which has no parallel in the ESA. *Id*. at 52 (recounting history of NFMA well-distributed rule). The physiographic provinces developed for practical and analytical purposes in the past do not meet the Handbook definition of a recovery unit.

This is not to say that habitat distribution is unimportant for conservation. It may, in many circumstances, be extremely important. But the significance of habitat distribution across the entire range of a wide-ranging species like the northern spotted

owl must be determined for every species based on the best available scientific information; the USFWS cannot simply decide as part of an *a priori* "*rule set*" that every physiographic province must have a viable population of spotted owls, as it did here.

3. The USFWS used a novel, never-before-revealed definition of "*occupied at the time of listing*" that is neither based on the best science nor consistent with the legal requirements of the ESA.

The USFWS presented the following definition of the statutory term "*occupied at the time of listing*":

> *"Based on the best available scientific information regarding population structure of northern spotted owls, we define 'occupied'' as encompassing (1) home ranges of resident, territorial spotted owls known from surveys to be present at the time of listing, (2) home ranges of territorial owls determined likely to have been present at the time of listing based on a model developed specifically to predict owl presence based on relative habitat suitability, and (3) nonterritorial and dispersing owls that were likely to be present within the matrix of territories in a given landscape known to be occupied by resident owl pairs."* 77 Fed. Reg.14096.

The USFWS revealed this new definition of "*occupied*" in its 23rd year of spotted owl regulatory practice under the ESA, without so much as an acknowledgement that the new definition is entirely different from any previous regulatory practice the agency has ever employed, let alone an explanation of why it was abandoning its longstanding practice.

Not one of three categories is scientifically or legally defensible.

A. <u>Using Surveys Between 1987 and 1996</u>

The USFWS explained:

> *"Our proposed critical habitat is based in part on the distribution of approximately 4,000 spotted owl territories verified as occupied at the time of listing, across the geographical range of the species (USFWS 2011, p. C– 62). We use the term ''verified'' here to represent locations or which we have records indicating the presence of spotted owls at the time of listing. These data are the result of surveys conducted by Federal and State agencies, private timber companies, and researchers between 1987 and 1996. We consider this time period to reasonably represent the time of listing because spotted owls are relatively long-lived and exhibit a high degree of fidelity to territory core areas; their territory locations are*

> *therefore relatively stable through time unless substantial changes occur to territory habitat. For this reason, we consider it highly likely that locations occupied between 1987–1990 and 1990–1996 were also occupied at the time of listing in 1990."* 77 Fed. Reg. 14096.

The USFWS has never before defined "*occupied at the time of listing*" to mean occupied once in a nine-year period before and after the time of listing. Neither in 1992 nor in 2008 did the USFWS advance the position that occupancy in a site up to three years before nor six years after the date of listing constituted "*occupied at the time of listing*." In 2008 the agency explained:

> "*The 1992 rule used the term 'occupied' in terms of individual occupied sites with pairs or resident single owls. Under this approach, the 'unoccupied' areas they describe were actually cases of unknown occupancy. All critical habitat in 1992 and in the current designation are within the occupied range of the northern spotted owl at the time of listing.*" 73 Fed. Reg. 47338 (2008 designation).

The 2011 Revised Recovery Plan (page G-3) defines "*Occupied Site**:** Any location where territorial spotted owls are known to be present."* The definition does not encompass inferences from occupancy years before or after.

Through 2008 USFWS thus acknowledged that areas without evidence of physical occupancy in the year of listing were "*of unknown occupancy*"; never before has the agency claimed that a site was occupied in 1990 because an owl was detected at that site any time between 1987 (three years before the listing) and 1996 (six years after the listing). Until 2012, USFWS tried to justify its designations of unoccupied sites on the ground that these areas lay within "*the occupied range"* of the owl, a term not found in the ESA, and lacking scientific and legal basis. Perhaps USFWS has finally realized its previous approach was legally flawed; in any event, USFWS must explain why it suddenly changed its methodology for determining "*occupied at the time of listing*" more than two decades after first designating critical habitat for the northern spotted owl.

The current USFWS position contradicts its own science asserted for two decades. "*Not all spotted owl sites are occupied by spotted owls each year*." 55 Fed. Reg. 26192 (1990 listing). "*It is not uncommon for an occupied*

spotted owl site to be unoccupied in subsequent years, only to be re-occupied by the same or different spotted owls two, three or even more years later (Dugger et al. 2009)." Revised Recovery Plan III-45 (2011). Occupancy at a site in one year out of a nine year period (1987-1996) does not establish that the same site was occupied *"at the time of listing*."

The data base of 3,790 "*verified*" owl sites used by the USFWS also does not square with the 2011 Revised Recovery Plan, which, notes, along with many other sources, *"[a]s of July 1, 1994, there were 5,431 known site-centers of spotted owl pairs or resident singles*." Revised Recovery Plan A-2. The USFWS should explain why it only used 3,790 of the 5,431 sites known in 1994. The Revised Recovery Plan (C-20) reports that the modelers only used data from sites documented as occupied within three years of the bookend dates of their habitat analysis (1996 and 2006), meaning they used data from no site documented before 1993. This is not consistent with the time period used for the critical habitat proposal (sites documented as far back as 1987).

B. Modeling.

The modeling component of the new definition of occupied at the time of listing is not the best available science, and may not be used for designating northern spotted owl critical habitat. The proposal relies on the three-stage, four-model methodology devised by the USFWS's modeling group (generally referred to as "Dunk et al.) for the 2011 Revised Recovery Plan. The GNN model provides data for the MaxEnt model, which provides data for the Zonation model, which provides data for the HexSim model.

Statisticians at West, Inc. reviewed the MaxEnt model and reached the following conclusion:

> *Based on the results in the Royle et al. (2012) and Torres et al. (2012) papers and the differences that we find between MaxEnt and maximum likelihood estimation applied to the U.S. Fish and Wildlife Service data from the Southern Western Cascades and Klamath East,* ***we believe that the results obtained from a MaxEnt analysis*** *may be misleading for habitat modeling in general, and* ***are unreliable with habitat modeling for northern spotted owls in particular****.* ***Also, as the U.S, Fish and Wildlife Service analysis used the output from MaxEnt for further analyses***

using the Zonation and Hexsim programs we believe that the results from these further analyses are also not reliable.

Further, they state: "*Clearly, if the MaxEnt results are suspect then the results from the second and third stages of the modeling process which are based on the MaxEnt results are suspect as well.*"

In addition, the models rely on local and regional "*extinction levels*" that are unexplained, have no evident scientific basis, and are arbitrary. This does not meet the statutory requirement to use best available science.

Also, the scientific basis for using these models to "*backcast*" 22 years to 1990 to meet the statutory requirement in Sec. 3(5)(A)(1) that areas be occupied "*at the time of listing*" is unexplained and does not appear to exist.

For these reasons, the USFWS may not rely on the three-stage, four-model methodology used in the critical habitat proposal.

C. Inclusion of "non-territorial and dispersing owls"

Non-territorial and dispersing owls have never before included in any definition of spotted owl occupancy or occupied habitat in any USFWS document before this critical habitat proposal. Non-territorial and dispersing owls are undetectable. By definition, their location is unknown and unknowable. The USFWS has no information to identify any particular area as "*occupied*" by a non-territorial or dispersing owl. Even the pro-FWS panel of judges in *Arizona Cattle Growers' Ass'n v. Salazar*, 606 F.3d 1160 (9th Cir. 2010) recognized:

> *"It is possible for the FWS to go too far. Most obvious is that the agency may not determine that areas unused by owls are occupied merely because those areas are suitable for future occupancy. Such a position would ignore the ESA's distinction between occupied and unoccupied areas."*

That is what USFWS has done here, at best: characterize habitat as occupied at the time of listing without any site-specific evidence simply because it is possible that a non-territorial or dispersing owl may have used that habitat at some time.

The proposal does not identify which areas proposed for inclusion as critical habitat are deemed to have been "*occupied at the time of listing*" on the

basis of the hypothesized presence of an undetectable non-territorial or dispersing owl, but all such areas must be excluded from the occupied portion of the proposal.

The USFWS also improperly defined vast critical habitat units, containing tens of thousands of acres, as "*occupied*" on the theory that any past report of even a single owl anywhere within the vast area at any time is sufficient to characterize the entire area as occupied. Evidence of actual occupancy of each specific area is required, and the USFWS cannot evade this requirement by lumping together hundreds of specific areas into a single vast "*recovery unit*." The unsupported belief that later occupancy establishes occupancy at the time of listing is also unlawful. *Otay Mesa Property, L.P. v. U.S. Dept. of Interior*, 646 F.3d 914 (D.C. Cir. 2011).

4. FWS based the entire proposal on the untested assumption that barred owl-spotted owl interaction rates could be reduced below current levels although there is no scientific basis for that assumption.

The proposal essentially concedes that conservation of the northern spotted owl to the point of delisting is simply not possible at the current level of barred owl displacement of northern spotted owls.

> *"Given that critical habitat cannot be expected to ameliorate non-habitat based stressors to spotted owl populations, it was necessary to establish reasonable assumptions regarding barred owl encounter rates (the probability that a given spotted owl territory also has barred owls present) that we believed could, along with critical habitat designation, lead to recovery of the northern spotted owl. Absent such an assumption, it would not be possible to identify those areas essential to the conservation of the owl, as the negative effect of barred owls would essentially mask the positive effect of habitat on spotted owl populations. Therefore, as part of the critical habitat modeling process, we established region-specific barred owl encounter rates based on preliminary analyses conducted as part of the modeling process (Dunk et al. 2012) and barred owl encounter probabilities estimated from long-term demographic study areas (Forsman et al. 2011) within each modeling region. In some areas ... we used encounter rates that were less than current levels, but at levels we believed could potentially be maintained through management activities."* 77 Fed. Reg. 14066.

In making a regulatory decision, a federal agency "*may use assumptions, but only to the extent that those assumptions have some basis in reputable scientific evidence*."

American Federation of Labor and Congress of Indus. Organizations v. Occupational Safety and Health Admin., U.S. Dept. of Labor, 965 F.2d 962, 979 (D.C. Cir. 1979). Judicial review of agency action "*does not exclude review of the underlying facts and assumptions upon which the agency acted*." *National Cable Television Ass'n, Inc. v. F. C. C.*, 479 F.2d 183, 193 (D.C. Cir. 1973). USFWS must have "*reputable scientific evidence*" to support its assumptions, and must identify that evidence in its decision.

Here, USFWS has no scientific basis whatever to believe that barred owl-spotted owl interactions can be reduced, through eradication otherwise, below the current levels. USFWS concedes in its Draft Barred Owl Removal EIS that:

> *"The need for the action is that we lack desired information to: (1) determine the response of northern spotted owl occupancy, survival, reproduction, and population trend to barred owl removal."* Barred Owl DEIS xxiii.

The study will take 3-10 years. *Id*. Lacking this information, USFWS may not rely on an arbitrary and unsupported assumption in making its critical habitat decision. If USFWS has no way to estimate future barred owl-spotted owl encounter rates, then the only permissible decision at this time is to decline to designate critical habitat on the ground that it is not "*determinable.*" ESA Sec. 4(a)(3).

5. The proposal fails to recognize that Washington and California law attaches legal consequences to land federally designated as critical habitat.

The proposal states:

> *"Aside from this requirement specific to Federal agencies, critical habitat designations do not provide additional regulatory protection for a species on non-Federal lands, unless the activities proposed involve Federal funding or permitting. In other words, designation of private or other non-Federal lands as critical habitat has no direct regulatory impact on the use of that land unless there is such a Federal connection".* 77 Fed. Reg. 14063.

This statement is misleading in that many private landowners rely on reciprocal right of way agreements with the federal government to gain access to their land, and if the adoption, amendment or use of these agreements across federal land designated as spotted owl critical habitat requires ESA consultation, the impacts on private landowners could be major. Further, both Washington law and California law allow state regulatory agencies to attach mandatory regulatory restrictions, either procedural or substantive or

both, to private lands that have been federally designated as critical habitat under the ESA.

6. The proposal contains an unexplained and scientifically unsupported reversal of the USFWS's longstanding definition of dispersal habitat.

On page 14077, the proposal states: *"The survivorship of northern spotted owls is likely greatest when dispersal habitat most closely resembles nesting, roosting, and foraging habitat, but owls may use other types of habitat for dispersal on a short term basis."* The USFWS has no scientific basis for that statement, which contradicts the USFWS's consistent position since 1990 that dispersal habitat makes up a much broader range of forested areas than nesting, roosting, and foraging habitat. The Revised Recovery Plan (page C-57) admits: *"[R]elatively little is known about the characteristics of areas used by dispersing spotted owls."*

7. The proposal does not meet the required legal standard for justifying the use of the computer models. USFWS should publish additional explanation and reopen the comment period for better-informed input from the public.

"*When an agency uses a computer model, it must explain the assumptions and methodology used in preparing the model and, if the methodology is challenged, must provide a complete analytic defense*." *U.S. Air Tour Ass'n v. Fed. Aviation Admin.*, 298 F.3d 997, 1008 (D.C. Cir. 2002), *cert. denied sub nom. AirStar Helicopters, Inc. v. Fed. Aviation Admin.*, 538 U.S. 977 (2003), *quoting Small Refiner Lead Phase–Down Task Force v. Envtl. Prot. Agency*, 705 F.2d 506, 535 (D.C. Cir.1983); *Owner-Operator Indep. Drivers Ass'n, Inc. v. Fed. Motor Carrier Safety Admin.*, 494 F.3d 188 (D.C. Cir. 2007). USFWS has not explained the assumptions and methodology used in preparing the multi-stage model used for the critical habitat proposal in a legally sufficient manner, and thus has denied the public adequate information to comment intelligently on the proposal.

FWS maintained secrecy over the work of the modeling group throughout its labor in 2011 and 2012 (during recovery planning and critical habitat development), never permitting the public to observe its work, understand the underpinnings of the

models, or provide useful information to the group. The current public comment period, though welcomed, does not make up for this past secrecy because the proposal and associated documents (Dunk et al.) do not provide enough information on many relevant issues as noted throughout AFRC's comments and appendices.

8. The proposal relies on new, never-before used definitions of "*primary constituent elements*" that are not meaningfully defined, are over inclusive, and therefore are not essential to the conservation of the spotted owl.

The joint USFWS regulations require a critical habitat designation to identify and focus upon "*principal biological or physical constituent elements*" of critical habitat. 50 C.F.R. §424.12(b). "*Primary constituent elements may include, but are not limited to, the following: roost sites, nesting grounds, spawning sites, feeding sites, seasonal wetland or dryland, water quality or quantity, host species or plant pollinator, geological formation, vegetation type, tide, and specific soil types."*

The proposal does not properly identify the PCEs for northern spotted owls. The first listed element is simply a list of forest types that essentially describes virtually all of the evergreen forests (and some hardwood forests) anywhere in the world. 77 Fed. Reg. 14092. There is nothing to connect such forests to use by the northern spotted owl, and the list of forests by itself has no meaning to spotted owl conservation.

The fourth listed element, relating to dispersal habitat, is likewise written in such broad terms that virtually any evergreen forest stand could be considered dispersal habitat. The definition is little more than "*dispersal habitat is any habitat that could be used for dispersal*." There is no content to the definition, and it does not meet the requirements of the regulations.

9. A Regulatory Flexibility Analysis is required.

The draft economic analysis is flawed for reasons presented elsewhere in these comments. A substantial number of small businesses will be significantly economically affected by this critical habitat designation. A regulatory flexibility analysis under the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*) must therefore be prepared.

The USFWS is wrong in asserting that only federal agencies will be "*directly regulated*" by a critical habitat designation. 77 Fed Reg. 32492 (June 1, 2012). The private sector that relies directly and indirectly on federal timber sales is also directly

regulated by a critical habitat designation. The USFWS's narrow interpretation nullifies the application of RFA to critical habitat designations, and is contrary to two decades or practice and precedent. The RFA requires consideration of "*the small entities which will be subject to the proposed regulation -- that is, those small entities to which the proposed rule will apply.*" *Cement Kiln Recycling Coalition v. E.P.A.*, 255 F.3d 855, 869 (D.C. Cir. 2001). A critical habitat designation "*applies to*" private parties as much as federal agencies; a private party seeking a federal permit that may affect designated critical habitat cannot obtain the permit until an ESA consultation is completed, and has a statutory right to participate in that consultation. Congress' determination that applicants have a statutory right to participate in a consultation means that the permit-applicant is "*subject to*" the designation as much as a federal agency.

The USFWS's methodology for asserting that a substantial number of small businesses will not be significantly affected by the designation is flawed. The small entities involved in critical habitat consultations are likely to include the largest of the small businesses, lumber manufacturers with up to 500 employees. Counting one lumber manufacturer with 475 employees as equal to a self-employed logger because each is "*one*" small business makes the statistical comparison meaningless. Further, the USFWS's estimate that only 50 consultations per year will occur on any timber management project within the designated critical habitat, using some unexplained information about consultation history between 1992 and 2012 presented in "Exhibit 4-9" of the Draft Economic Assessment. This estimate significantly understates the likely number of consultations, which is more likely to be over 200 per year based on recent data, including all forms or formal and informal consultation.

10. The incremental economic effects methodology is legally flawed.

The USFWS persists in using an incremental analysis methodology to analyze economic impacts of critical habitat designation despite many courts, including the Tenth Circuit in *New Mexico Cattle Growers*, 248 F.3d 1277 (10th Cir.2001), having ruled that the incremental analysis methodology improperly trivializes the impacts of critical habitat. The USFWS's draft economic assessment is materially inaccurate and must be revised.

11. The USFWS should consider Sec. 4(b)(2) economic exclusions of O & C timberlands.

The O & C timberlands have a unique statutory purpose and historical context that justifies an exclusion from critical habitat under the Secretary's discretionary power set forth in Section 4(b)(2) of the ESA.

Comments on the *Draft Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl* May 29, 2012, Industrial Economics, Inc

The *Draft Economic Analysis of Critical Habitat Designation for the Northern Spotted Owl* understates the economic impact of the proposed Critical Habitat Designation on federally managed lands by misrepresenting the current situation (baseline) and severely underestimating the impacts this designation will have on timber harvest and the resulting economic loss. It also is not a meaningful economic analysis of the proposed action as it shows over 100 potential outcomes depending on what scenarios are chosen for federal, state and private lands.

Baseline Assumption Errors

1. For the Forest Service, the Economic Analysis erroneously uses what was harvested between 1995 and 2010 to represent the starting point for determining the baseline.

    a. What is harvested each year is a function of the demand for wood products coupled with what the agency has sold. What is sold is a function of how well the agencies implemented what was funded by Congress. In recent years, these factors have lead to harvest values well below what the agencies can do and what they should be doing under their formally adopted Land Management Plans. The true baseline is determined by the formally approved land management plans of each National Forest.

2. For the BLM, the Economic Analysis reworked the data given to them by the BLM to estimate annual volume reductions. The process they used is not clearly presented and the end results are far lower than estimated by the BLM.

3. The Economic Analysis erroneously presumes that all of the recommendations made in the recently adopted Spotted Owl Recovery Plan are being fully implemented and therefore their economic affect has already occurred and is therefore incorporated into the baseline.

    a. The USFWS has always emphasized that Recovery Plans are non-regulatory and therefore not legally binding. Federal agencies have a legal responsibility to contribute to the recovery of the species but do not need to fully adopt all the recommendations incorporated in a Recovery Plan. For this reason, Recovery

Plans do not go through the regulatory process and may not be challengeable in courts of law. Since the action agencies have discretion on implementing the recommendations found in a Recovery Plan, it is illogical to assume in the economic analysis that all of the recommendations are being implemented and therefore should be included in the baseline. The USFWS recognizes the discretionary nature of the Recovery Plan and the uncertainly associated with its full implementation on federal lands.

> *"While these are discretionary actions for the Forest Service and BLM, the agencies have been implementing some of these conservation measures as part of their timber sales."*[5]
>
> *"Implementing the Revised Recovery Plan would be at the discretion of the land manager."*[21]
>
> *"If the agencies choose not to apply voluntary conservation measures from the Revised Recovery Plan, land-use changes may occur on all of the lands programmed for timber harvest (3.8 million ac), although, as stated above, determining specific changes as a result of critical habitat designation is speculative at this time; conversely, if the agencies choose to apply conservation measures described in the Revised Recovery Plan, then land-use changes may only affect a subset of lands programmed for timber harvest (1,389,800 ac)."*[21]

b. All of the economic impacts of implementing the recommendations of the Recovery Plan inside the proposed Critical Habitat units should be attributed to the designation of Critical Habitat if the USFWS determines that these are a required to avoid adversely modifying or destroying critical habitat as required by law.

c. No impacts of implementing the recommendations of the Recovery Plan should be assumed inside of Critical Habitat as these are again purely recommendations not requirement.

4. The following assumptions being made in the Economic Analysis should be removed.

   a. "*All 11 of the CHU's are presently occupied*."

[5] USDI, USFWS - Draft Environmental Assessment: Designation of Critical Habitat for the Northern Spotted Owl (June 4, 2012)

This is not a valid assumption as most of the CHU's have not been recently surveyed and have all been invaded by the barred owl since the last time surveys were conducted. While it may be true that most of the CHU's had historic sightings of individual and in some cases pairs of spotted owls over the past 25 years, there is no indication that these are currently occupied. The USFWS admits to this in Appendix B,

> *"While spotted owl surveys occur in all the proposed CHUs, they are not conducted evenly throughout the range or within CHUs. When we consult on activities potentially affecting spotted owls and their habitat, more often than not there are no current survey data to inform our analysis." "Because current spotted owl survey data are not available for large parts of the species' range…"*

Since the reality is that it is unknown if spotted owls currently occupy the CHU's, the baseline should not assume so but rather assume no occupancy.

b. *"More recently, timber sales in all of these non-reserved areas that are occupied by spotted owls have been generally designed following the recommendations of the Revised Recovery Plan… Therefore, we would not be likely to request significant changes in the project design due to critical habitat."*

While it might be true that most of the current timber sales are incorporating aspects of the Recovery Plan, there is no requirement for them to do so nor any reason to assume they would do so on every proposed action. Each agency has the latitude to determine how best to meet its ESA obligation to contribute to the recovery of the species. As stated earlier, the Recovery Plan is advisory only so it should not be assumed that it is being fully implemented in the baseline analysis.

c. "*Using these data we determined that within the spotted owl proposed critical habitat designation approximately 6.5 percent of the spotted owl habitat is likely to be unoccupied by territorial spotted owls."*

This is a highly illogical assumption when one examines the USFWS claims about the current demography of the spotted owl. In the latest report on the demography of the spotted owl, it is claimed that the number of spotted owls has been declining at an annual rate of 2.8% since 1985. This would mean that the spotted owl population has declined by at least 54% since 1985. How could the population have declined by 54% yet still occupy 94.5% of the 14 million acres

within the proposed critical habitat? Assuming an average home range of 4,000, this would equate to a current population size of 6,600 owls which is two to three times the size of the population the USFWS estimated existed at the time of listing. Either the primary basis for listing or the above assumption is incorrect. The USFWS cannot rely on one assumption for listing and another for determining the economic impacts of its actions.

d. *"Therefore, we expect the addition of an adverse-modification analysis to both existing consultations in most cases to be a relatively minor administrative burden of an additional 4-6 hours per consultation between all Federal staff working on the consultation."*

   This is a gross underestimate of the time it takes for the federal agencies to complete the re-consultation process. If this is supposed to include both the action agency and the USFWS, the actual time is probably more in the neighborhood of 60-80 hours or more. There are examples where this process has taken 6 month to a year. It can also result in changes to the project which is not reflected in the economic analysis.

5. The true baseline is represented by the land management plans that have been adopted by the agencies through the formal rule making process.

   a. For the Forest Service this is the individual Forest by Forest Land Management Plans adopted in the 1990's as amended by the Northwest Forest Plan (NWFP).

   b. For the BLM, these are the District by District Land Management Plans adopted in the 1990's (these incorporate the NWFP).

   c. The current long term sustained yield associated with these plans within the area encompassed by the proposed Critical Habitat designation is 533 mmbf for Region 6 of the USFS, 161 mmbf for Region 5 of the USFS, 203 mmbf for the BLM for a total of 840 mmbf.

   d. Since these sale levels represent what is sustainable on only the land classified as Matrix, there should be no reductions based on the listing since the formally adopted strategy for the federal contribution towards recovery is already

incorporated in the NWFP. The economic impacts of adopting Critical Habitat must use 840 mmbf as the baseline.

e. The USFWS agrees that the economic impacts of the recommendations of the Recovery Plan and the proposed designation of Critical Habitat on non-matrix lands have already been incorporated in the NWFP. The USFWS states in Appendix B:

> *"Currently, the guidelines for managing the large reserves of the NWFP are more restrictive than the recommendations for reserved lands in the Revised Recovery Plan or in the proposed revised critical habitat designation."* "*While reasonable and prudent alternatives could substantially change a proposed project and affect the economic gains from a timber project, a determination that a project would result in jeopardy or adverse modification with respect to spotted owls is an extremely rare event because: (1) the Northwest Forest Plan (NWFP) guides the development of BLM and Forest Service actions in a manner that considers the conservation needs of the spotted owl."*

Underestimation of Impacts

1. Because of the faulty assumptions made in establishing the baseline, the timber sale impacts of the proposed Critical Habitat designation are grossly underestimated.

a. The Economic Analysis concludes that the maximum impact on timber harvest would be 24.56 mmbf per year. Data provided to the USFWS by the BLM indicates that their estimate of timber harvest reduction associated with the proposed designation on the 1.5 million acres of their land encompassed by it to be 111 mmbf which represents over one half of the current 203 mmbf authorized under the NWFP. The BLM only manages 10.6% of the total 14 million acres proposed for designation.

b. The Forest Service manages 9.5 million acres of the proposed Critical Habitat. They did not provide the USFWS with an estimate of what they anticipated the reduction in timber harvest to be. Since the Forest Service manages 6.3 times as many acres as the BLM, one could assume the impact would be far greater than the 111 mmbf estimate for BLM only lands.

c. The USFWS estimated there are 3,138,411 acres of the proposed Critical Habitat designation that are within the Matrix and other non-reserve allocations. Of these, 282,899 are on BLM land and this accounts for a 111 mmbf reduction in annual allowable sale quantity. This means 2,855,512 acres of matrix and other non-reserved lands are managed by the Forest Service which is over 10 times that managed by the BLM. You can see that the annual impacts could be 350 mmbf – 400 mmbf if the same proportional reductions as used that were estimated by the BLM.

2. The impacts of the timber sale reduction should be limited to the economic sector affected by the proposed critical habitat designation and not watered down by analysis of the total economic base of the counties.

a. The Economic Analysis utilizes the total economic condition of each county as the unit to be measured when assessing economic impact. Projecting the future economies of counties is highly speculative and only serves to water down the true impacts of the agencies actions. The analysis should be focused on the timber industry and allied industries. Each million board feet (mmbf) of annual harvest supports 9 direct and 9 indirect jobs. If the annual timber sale program is reduced by 500 mmbf, 9,000 current and potential jobs would be lost. This loss is aggravated by the loss of tax revenue and the unemployment burden the Counties would have to bear.

3. The financial impacts of the proposed designation are grossly underestimated.

a. In the economic analysis, there are no economic impacts of indirect jobs being lost due to the reduction in timber harvest. Each million board feet (mmbf) of annual harvest supports 9 direct and 9 indirect jobs. If the annual timber sale program is reduced by 500 mmbf, 9,000 current and potential jobs would be lost. This loss is aggravated by the loss of tax revenue and the unemployment burden the Counties would have to bear.

b. The Economic Analysis "*high impact*" financial estimation is based on a $250/mbf stumpage value. The DNR in Washington is currently receiving $350/mbf and these are expected to rise as the economy recovers. Using

$100/mbf at the low end and $250 at the high end grossly underestimates the true economic cost of this proposed action.

c. Even using these low figures, the Economic Analysis estimates that the annual cost of each mmbf lost is $250,000. If 500 mmbf are lost, this equates to a financial impact of $125,000,000 per year. If one assumes a more realistic stumpage rate of $350/mbf the cost raises to $175,000,000 not the $6,140,000 estimated in the Economic Analysis. The loss of wages, taxes and increase in unemployment cost would raise this significantly.

Option Analysis Meaningless

1. The Economic Analysis is not a meaningful economic analysis of the proposed action as it displays the results as a menu of choices.

    a. The results of the analysis are displayed as a table of choices with four categories each of which having six potential outcomes. Over 100 possible combinations arise with such an approach. This renders the analysis meaningless. One of the stated purposes of this analysis is to aid the Secretary in determining if any lands should be exempted due to the financial burden associated with the proposed designation. This approach does not accomplish this objective.

Comments on the Draft Environmental Assessment:
Designation of Critical Habitat for the Northern Spotted Owl

The Draft Environmental Assessment: Designation of Critical Habitat for the Northern Spotted Owl fails to meet the requirements of the National Environmental Policy Act and must be withdrawn and replaced by an environmental impact statement to support the critical habitat proposal.

Errors in Scoping and Public Participation

The USFWS indicates that they conducted scoping which related to the purpose of "*the conservation and recovery needs of the spotted owl, fulfilling the statutory requirements of the ESA, all while minimizing effects to other land and resource uses by using an efficient network design."* This is incorrect. Never in the scoping process did the USFWS disclose these elements were included in the Purpose and Need of the project. They also wrongly assumed that they did not need to address how this action will affect other resources.

> *"…we have assumed that other specific resource issues (such as recreation, water quality, and visual resources) are not primary issues requiring our full treatment or analysis in this draft EA. We think these issues are not likely relevant to the regulatory process of designating critical habitat (any ancillary relevance to these issues is more likely related to the current listed status of the northern spotted owl, which is not the focus of this decision), or are unrelated to the decision"*

In fact, the designation of 14 million acres of land could have a profound effect on these resources.

Errors in the Purpose and Need

The USFWS lists two purposes for the revision of critical habitat. The first is "*to designate critical habitat in accordance with the ESA and its implementing regulations*" and the second is to "…*also designate critical habitat in a way that will achieve the greatest relative conservation and recovery goals for the northern spotted owl but simultaneously minimize effects to other land and resource uses by using an efficient network design."* The first purpose is correct but the second is erroneous. Nowhere in the ESA and its implementing regulations does it state that critical habitat designations "*achieve the greatest relative conservation and recovery goals."* The recognized standards for lands to be included in critical habitat is that they were "*occupied by the species, at the time it is listed*" and contain "*those physical or biological*

features (I) essential to the conservation of the species and (II) which may require special management considerations or protection."

The need for the action is inaccurately described. Draft Environmental Assessment (DEA or Draft EA) at 2. USFWS requested remand of the 2008 critical habitat designation for the purpose of considering a new designation, and USFWS requested November 15, 2012 as the date on which the new designation would be completed. The need for the action is whatever USFWS's motivation was in requesting remand of the 2008 designation – not an order from a court that USFWS requested.

The stated purpose for the rule is both too broad and two narrow. Complying with the ESA is not a purpose of any action; it is a legal duty that USFWS must observe at all times. Complying with the law is not a proper purpose under NEPA. The DEA also states: "*our purpose is to also designate critical habitat in a way that will achieve the greatest relative conservation and recovery goals for the northern spotted owl but simultaneously minimize effects to other land and resource uses by using an efficient network design. That is, to maximize conservation value to the species while minimizing human use conflicts.*" DEA at 3. While that objective may be valid, that is too narrow a purpose under NEPA because it eliminates permissible alternatives that fully comply with ESA but do not necessarily achieve the "*greatest relative conservation and recovery goals for the northern spotted owl,*" and improperly constrains the Secretary's exclusion authority under §4(b)(2) of the ESA.

"*While it is true that defendants could reject alternatives that did not meet the purpose and need of the project, ... they could not define the project so narrowly that it foreclosed a reasonable consideration of alternatives*." *Davis v. Mineta***,** 302 F.3d 1104, 1119 **(**10**th** Cir. 2002**)**. *"[A]n agency cannot define its objectives in unreasonably narrow terms*." *Friends of Southeast's Future v. Morrison*, 153 F.3d 1059, 1066 (9th Cir. 1998). The "*greatest relative conservation*" objective effectively eliminates all alternatives except the one developed by the USFWS modelers for this critical habitat proposal. That result is impermissible under NEPA.

Inadequate Range of Alternatives

"*The alternatives provision of NEPA applies whether an agency is preparing an EIS or an EA, and NEPA's implementing regulations require an EA to include brief discussions of the need for the proposal, of alternatives ..., of the environmental impacts of the proposed action and*

alternatives, and a listing of agencies and persons consulted." *Native Ecosystems Council v. U.S. Forest Service*, 428 F.3d 1233, 1245 (9th Cir. 2005).

"[A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991).

"[O]nly two alternatives were studied in detail: the no build alternative, and the preferred alternative. FHWA acted arbitrarily and capriciously in approving an EA/4(f) that does not provide an adequate discussion of Project alternatives." *Davis v. Mineta***,** 302 F.3d at 1122.

The Draft EA does not consider a reasonable range of alternatives. It considers two alternatives: the No Action alternative of maintaining the 2008 designation, and adopting one of the potential outcomes of the proposed rule, which offers four choices. Alternatives B, C, D and E are the four options in the proposed rule. No other alternative was considered in the EA, and no other alternative was analyzed and excluded from detailed consideration. The Draft EA never explains why no alternative was evaluated except the proposed rule and the no action alternative. While USFWS claims that *"[w]e consider the various network scenarios assessed in the modeling efforts as alternatives considered but not fully evaluated*," DEA at 25, there was no environmental evaluation of such alternatives in the modeling work, and no consideration in the modeling work of any potential environmental effects of any alternative. Those rejected network scenarios are not alternatives considered and excluded from detailed review.

Inadequate Identification of Environmental Issues

The Draft EA does not consider or even recognize the full range of potential environmental impacts of the potential reduction or elimination of timber harvest on 1.4-3.8 million acres. The only environmental effects that are even discussed in the Draft EA are effects on the northern spotted owl, other federally listed species of fish, wildlife and plants and the barred owl (DEA 48):

> *"Because it is not possible to consider effects of designating critical habitat for the northern spotted owl on all 1,200 plus wildlife and plant species occurring within the spotted owl range, we will limit our analysis to effects on those species listed as endangered or threatened by the ESA that could occur within northern spotted owl critical habitat; we conclude that these are the most salient species relative to the action. In addition, we will consider the effects of critical habitat designation on barred owls…"*

This explanation is deficient for two reasons: first, as the 1993 FEMAT Report and 1994 FSEIS show, it is possible to develop an analysis of impacts of land management alternatives on all of the species found within the range of the northern spotted owl. The Draft EA does not explain why USFWS finds it impossible to do what it did, along with BLM, FS and other federal agencies, in 1993 and 1994.

Second, USFWS does not appear to understand that environmental impacts are not limited to wildlife and plant species, even though its own statutory mandate may be so limited. Indeed, the purpose of NEPA is to force agencies to consider impacts that fall outside their normal realm of endeavor. *Aberdeen & Rockfish R. Co. v. SCRAP*, 422 U.S. 289, 330 (Douglas, J. dissenting) ("*One purpose of the NEPA was to force agencies to acquire expertise in environmental matters, even if attention to parochial matters in the past had not demanded this capability.*")

Environmental impacts of land management decisions, including this one, extend to effects on air quality, water quality, soil productivity, forest ecosystems, aquatic ecosystems, forest health, risk of catastrophic wildfire, regional economics and communities. The Final Supplemental Environmental Impact Statement on the Northwest Forest Plan (February 1994) addresses every one of these environmental issues. On page 3&4-271, for example, it states: *"The change in availability of federal timber will likely affect regional forest product prices and spur increases in harvest from private and other public lands in the region."* The succeeding pages present a detailed analysis of the likely impacts of that change in timber supply sourcing. USFWS can and should do the same for this proposal, which is as broad or broader than the Northwest Forest Plan.

Errors in Alternative Development

As explained earlier in these comments, the process used by the USFWS to identify areas that contain "*those physical or biological features*" "*essential for the conservation of the species*" is incapable of doing so thus the entire description of all of the alternatives and their effects are erroneous. The USFWS failed to provide any scientifically valid information to substantiate that the lands included in the alternatives were occupied at the time of listing, require special management considerations or protection or are essential for the conservation of the species. We discuss earlier the shortcomings of the description of the primary constituent elements and the process used to define areas that are "*essential*." We incorporate by reference

all comments made above on the proposed revision and its accompanying economic analysis into these on the draft Environment Assessment.

Inadequate Analysis of Impacts

The Draft EA is inadequate to support a Finding Of No Significant Impact (FONSI). "*When examining a FONSI, our job is to determine whether the agency: (1) has accurately identified the relevant environmental concern, (2) has taken a hard look at the problem in preparing its EA, (3) is able to make a convincing case for its finding of no significant impact, and (4) has shown that even if there is an impact of true significance, an EIS is unnecessary because changes or safeguards in the project sufficiently reduce the impact to a minimum*." *TOMAC, Taxpayers of Michigan Against Casinos v. Norton*, 433 F.3d 852, 860-61 (D.C. Cir. 2006); *New York v. Nuclear Regulatory Com'n*, 2012 WL 2053581 *4 (D.C. Cir. 2012). "*Although environmental assessment (EA) need only include brief discussion of alternatives, that discussion must follow full and meaningful consideration of alternatives by agency*." Center for Environmental Law and Policy v. U.S. Bureau of Reclamation, 655 F.3d 1000 (9th Cir. 2011).

The Draft EA does not meet these standards. It does not accurately identify relevant environmental concerns, does not take a "*hard look*" at those concerns and presents no information that could justify a FONSI. Rather, USFWS merely claims that virtually every potential environmental effect is "*not reasonably foreseeable*" or "*speculative." "[A]n environmental effect is reasonably foreseeable if it is sufficiently likely to occur that a person of ordinary prudence would take it into account in reaching a decision.*" *Mid States Coalition for Progress v. Surface Transportation Board*, 345 F.3d 520, 549 (8th Cir. 2003), *quoting Sierra Club v. Marsh,* 976 F.2d 763, 767 (1st Cir.1992).

The Draft EA (page 39) acknowledges that the proposed critical habitat could limit or preclude timber management in 1.3 million to 3.6 million acres of federal land where timber harvest is now established as a management goal for those lands:

[F]or Federal lands, of the approximately 12.0 million ac of Federal lands proposed for critical habitat designation, a range of approximately 1.4 million (implementing Revised Recovery Plan on all actions) to 3.8 million ac (not implementing Revised Recovery Plan) could potentially experience some changes in land-use management as a result of designation of critical habitat. Compared with the No Action Alternative, this is an increase of approximately 1.3 to 3.6 million ac.

The Draft EA claims it is impossible to determine what the environmental effects will be from the proposed critical habitat because USFWS does not know what decisions will be made in future Section 7 consultations on individual federal agency actions. DEA at 40. Meaningful environmental analysis of potential impacts is not impossible. USFWS recognizes that possible agency responses to the critical habitat designation "*rang[e] from no projects*." Page 40. USFWS can define and assess the maximum potential impacts, where all 3.6 million acres of designated critical habitat now available for timber harvest are no longer available for timber harvest, and present information on the range of impacts from that level down to the hypothetical level of no impacts.

NEPA requires consideration of an environmental effect if the nature of the effect is reasonably foreseeable even if the extent of the effect is not. *Mid States*, 345 F.3d at 549. Here, it is entirely foreseeable that restrictions on federal forests will to some extent reduce timber harvest from those lands, and shift production to non-federal forests, as the 1994 FSEIS on the Northwest Forest Plan found, even if the precise amount of such changes cannot be accurately determined today. The most speculative and implausible conclusion USFWS could reach is that designating up to 3.8 million acres of federal timberlands as spotted owl critical habitat will have no effect on the management of those lands.

"*An agency must generally prepare an EIS if the environmental effects of a proposed agency action are highly uncertain. ... Preparation of an EIS is mandated where uncertainty may be resolved by further collection of data, ..., or where the collection of such data may prevent "speculation on potential. .. effects. The purpose of an EIS is to obviate the need for speculation by insuring that available data are gathered and analyzed prior to the implementation of the proposed action*." *National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 731-32 (9th Cir. 2001). If USFWS is truly unable to even estimate the possible environmental effects of its proposed designation, as it claims, then it is obligated to prepare an EIS to do so.

USFWS also misunderstands NEPA if it believes it is relieved of its NEPA duties because future federal actions will also undergo NEPA review: "*The Service assumes that for these actions, subsequent NEPA documents will address, at the appropriate spatial and temporal scales, the direct, indirect, and cumulative impacts of future actions.*" DEA at 26. While a future federal project that will have to undergo its own ESA consultation can be omitted from cumulative impacts analysis in an ESA consultation, 50 C.F.R. §402.02, NEPA has no similar

exception. 40 C.F.R. §§1508.7-.8. The Service's "*assumption*" about future NEPA review is therefore irrelevant to the scope of its NEPA duties on this proposal.

Errors in Describing the Environmental Consequences

The action alternatives wrongly assume that the USFS and BLM will implement 100% of the recommended actions incorporated in the Spotted Owl Recovery Plan. This topic is thoroughly discussed in our comments on the Economic Analysis. There are 3,811,900 acres of federal land within the proposed revision (Alternative 1) all of which will be affected by the proposed designation not the 1,389,800 acres they state in the EA. All of the action alternatives wrongly assume that only a portion of these will be affected because of full implementation of the Recovery Plans recommended actions. The agency readily admits that they do not know if the agencies will fully implement the Recovery Plan therefore under this uncertainty, they are obligated to assume they will continue to follow the management requirements of the Northwest Forest Plan and not impose further restrictions on the matrix lands.

> *"If the agencies choose not to apply voluntary conservation measures from the Revised Recovery Plan, land-use changes may occur on all of the lands programmed for timber harvest (3.8 million ac), although, as stated above, determining specific changes as a result of critical habitat designation is speculative at this time; conversely, if the agencies choose to apply conservation measures described in the Revised Recovery Plan, then land-use changes may only affect a subset of lands programmed for timber harvest (1,389,800 ac)." (page38)*

The USFWS is obligated to display the environmental consequences of the potential effects of its proposed action even if actual outcome is unknown. In describing Alternative 1, they state:

> *"There is a wide spectrum of management options that action agencies may choose to implement to avoid adverse modification of critical habitat, ranging from no projects, passive restoration actions such as closing roads or allowing for wildland fire use, or applying silvicultural treatments that meet ecological-forestry principles recommended in the Revised Recovery Plan. The Service cannot predict which of these or what combination of these, if any, the action agencies will pursue in critical habitat; as such, the effects of these actions are not reasonably foreseeable and we cannot analyze them. These subsequent actions will be subject to NEPA and ESA compliance, at which time, project- or program-specific analyses can occur." (page 40)*

The USFWS has identified a number of possible scenarios which may take place as a result of their proposed action, (*no projects, passive restoration actions such as closing roads or allowing for wildland fire use, or applying silvicultural treatments that meet ecological-forestry*

principles recommended in the Revised Recovery Plan). The environmental consequences of implementing these must be displayed in the environmental analysis.

The USFWS's description of the potential effects of the proposed action in relation to the barred owl is woefully inadequate. They recognize that the barred owl is present everywhere the spotted owl is and that it is having a significant negative effect on its survival and recovery. While they are proposing experimental removal of barred owls in another action, this has not been approved and if it was would only have short term impacts on a small portion of the spotted owls range. Until a long range plan has been adopted, funded and implemented, the effects of the continued growth of the barred owl population must be analyzed. Increasing the distribution and amount of spotted owl habitat is also increasing the desirability of the habitat for the barred owl therefore encouraging its population growth thus exerting more negative effects on the spotted owl. The increased barred owl population has also had an enormous impact on other, non-listed owl populations.

The USFWS tries to sidestep this issue by stating:

> *"Larger areas of spotted owl habitat are required to maintain sustainable spotted owl populations in the face of competition with the barred owl (Dugger et al. 2011)."*
>
> And "*By proposing to designate additional habitat distributed across the range of the northern spotted owl, the Service's goal would be to increase the likelihood that spotted owls would be able to persist in areas where barred owls are also present." (page53)*

The first of these statements misrepresents the research done by Dugger et al. and the conclusions reached by this study. According to the authors, "(*T)he purpose of our study was to determine whether Barred Owls had any negative effects on occupancy dynamics of nesting territories by Northern Spotted Owls and how these effects were influenced by habitat characteristics of Spotted Owl territories."* The research showed, "*... a strong, negative association between Barred Owl detections and colonization rates and a strong positive effect of Barred Owl detections on extinction rates of Spotted Owls"* i.e. the barred owl is having a very negative effect on spotted owls. They also found an, "*...increased extinction rates in response to decreased amounts of old forest at the territory core"* which is the 400 acres surrounding the nest site. They also found that non-territorial spotted owl dispersed better in less fragmented landscapes but this has been known for over 20 years and is incorporated into all of the current recovery strategies, i.e. NWFP and the 2008 Critical Habitat designation.

The research done by Dugger et al did not address the issue of whether larger providing more spotted owl habitat would in any way ease the impact the barred owl is having on the spotted owl. They simply researched the impact barred owls were having on currently known spotted owl sites. The only reference made in the Dugger paper relating to the need for larger protected areas is purely speculative in nature and was not the subject of the research. "(*T)hus, increased habitat protection for Spotted Owls* ***may*** *be necessary to provide for sustainable populations in the presence of Barred Owls."* The qualifier in this statement should read "*may or may not*" since their research did not address this issue. The USFWS's assertion in the Environmental Assessment that the Dugger paper shows that "(*L)arger areas of spotted owl habitat are* ***required*** *to maintain sustainable spotted owl populations in the face of competition with the barred owl"* is a total misrepresentation of this research paper.

The second statement made by the USFWS to support the reason why they do not address the effects the proposed action might have on barred owl and subsequently on the spotted owl is also has no scientific support. They state that their "*…goal would be to increase the likelihood that spotted owls would be able to persist in areas where barred owls are also present" "(B)y proposing to designate additional habitat distributed across the range of the northern spotted owl."* No one has ever do any study support the USFWS's assertion that increasing the amount of land designated as critical habitat will "*increase the likelihood that spotted owls would be able to persist in areas where barred owls are also present*". In fact, their own modeling team showed the exact opposite. Below is Figure 0-20 of Appendix C of the final Recovery Plan. Every scenario showed dramatic declines in the spotted owl population when only one of the many negative effects barred owl are having on spotted owls (survival) is taken into account and holds this effect constant rather than increasing it over time as the barred owl population continues to grow. The modeling tem ignored other effects such as reduced fecundity, dispersal etc. which would further increase the impacts of barred owls and decrease the population of spotted owls.

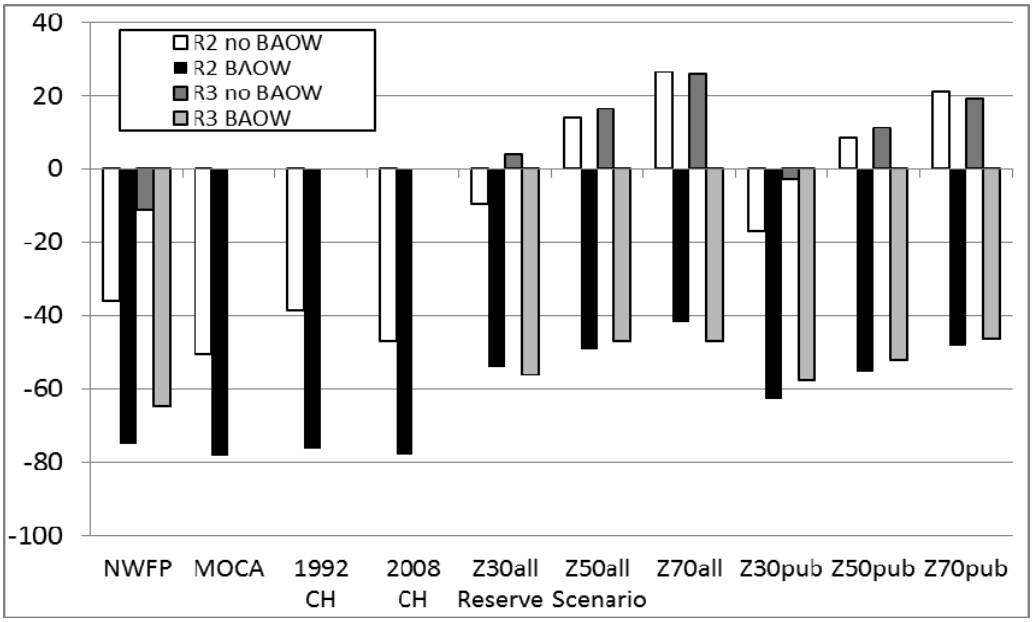


Figure 0-20. Percentage of modeling regions whose simulated populations declined by more than 75% between years 25 and 250 (indication of extinction risk) under the scenarios in Rounds 2 and 3, with and without barred owl influence.

The USFWS provides no scientific evidence to support their assertion that increasing the amount of critical habitat will ease the pressures of the barred owl. They must analyze the impacts of tier proposed action on the barred owl and then those effects on the spotted owl. All of the empirical evidence shows that the barred owl is present in all areas that the spotted owl lives, that its population is growing, that it is displacing the spotted owl from its habitat and will result in either the total extinction of the spotted owl or at best local extinction and an overall population decline of 90% or more. Imposing a designation of "*critical habitat*" on these lands will do nothing to keep these things from happening. The barred owl does not know if land has been designated and putting this designation on lands already occupied by the barred owl does nothing but impose management restrictions that help the growth of barred owl population more than the growth of the spotted owl population.

The only instance where increasing spotted owl habitat would aid the spotted owl is if that habitat was currently not being used by either the spotted owl or barred owl. In this case, both species could colonize the area which might relieve the pressures of the barred owl on the spotted owl for a very limited time and only in those areas adjacent to the newly created habitat. However, this is not the case. All spotted owl habitat is either being occupied by the spotted owl, barred owl or both. Designating these already occupied lands as critical habitat does nothing to increase the amount of available habitat. It only imposes the requirement that no

adverse modification or destruction of this habitat can occur. The USFWS must show the effects imposing these restrictions on the areas in the proposed revision will have on the barred owl population and on the spotted owl population.

The USFWS fails to describe effects other than those imposed by the barred owl on the spotted owl population in the EA. The only things they discuss are the outputs of the HexSim model, the shortcomings of which we have described earlier in our comments on the proposed revision. Regardless of all of the shortcomings of how the inputs to HexSim were developed, the model itself does not show the potential effects of implementing the proposed action but rather only the relative differences between different input values.

> *"It is important to recognize that the results are intended to allow comparison of **relative population performance** among alternative habitat conservation network scenarios, not predictions of actual population size or trend in the future."*[6]

The USFWS must show the effects the alternatives will have on the population of spotted owls. Just showing the relative differences between the outputs of what we have shown are faulty models is not adequate. The no-action alternative must show how the population of spotted owls will either grow or decline under the 2008 Critical Habitat designation assuming realistic impacts of the barred owl without management of that species. The latest demographic studies assert that the population has declined at an annual rate of 2.8% between 1985 and 2008. What is the USFWS's estimate of what the population will do in the future under the no-action alternative? Likewise, what is the estimate of future population trends of the other actions alternatives? It is only by seeing the benefits the action alternatives will have on the actual population of spotted owls can we assess the cost and benefits of these actions. The USFWS never discloses how the proposed action will lead to the recovery of the species and why the other alternatives will not. All they show is the results of a faulty modeling process that shows the relative differences between different scenarios which in our assessment will all lead to the extinction of the species throughout all or major portions of its range.

[6] U.S. Fish and Wildlife Service. 2011. Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service, Portland, Oregon. xvi + 258 pp. Appendix C

Inadequate Consideration of Effects on Private Land

The Draft EA dismisses the possibility of regulatory changes for private timberland in Washington state based on a new critical habitat designation as "*speculative*," DEA at 42, yet the Washington state regulatory officials who were interviewed identified the potential expansion of state-designated critical habitat to match federally-designated critical habitat as one of the "*additional restrictions that could be implemented by the State Forest Practices Board in response to the designation of critical habitat*." *Id*. That fact alone makes the possibility reasonably foreseeable, and it should be analyzed.

While the Draft EA claims any impacts on private land in California are speculative and cannot be assessed, the Draft Economic Analysis presents a clearer picture of potential impacts on private land in California:

The California Environmental Quality Act (CEQA), for example, requires that lead agencies, public agencies responsible for project approval, consider the environmental effects of proposed projects that are considered discretionary in nature and not categorically or statutorily exempt. In some instances, critical habitat designation may trigger CEQA-related requirements. This is most likely to occur in areas where the critical habitat designation provides clearer information on the importance of particular areas as habitat for a listed species. In addition, applicants who were "*categorically exempt*" from preparing an EIR under CEQA may no longer be exempt once critical habitat is designated. In cases where the designation triggers the CEQA significance test or results in a reduction of categorically exempt activities, associated impacts are considered to be an indirect, incremental effect of the designation.

Conclusion

The Draft EA does not take a hard look at any potential environmental impacts of the critical habitat proposal. Calling every potential effect "*speculative*" is legally insufficient. The purpose and need are defective, the range of alternatives is too limited, the analysis of impacts is grossly inadequate, and the range of potential environmental effects is impermissibly limited to effects on species, ignoring other environmental effects of forest management decisions that are well-established in prior federal agency documents and court cases.

The Draft EA as written cannot support a FONSI. USFWS must therefore prepare an environmental impact statement on the critical habitat proposal.

APPENDIX A

NCASI COMMENTS ON THE DRAFT PROPOSED CRITICAL HABITAT RULE FOR THE NORTHERN SPOTTED OWL

2 July 2012

Dr. Larry Irwin

(See Separate PDF File)

APPENDIX B

Comments on Statistical Aspects of the U.S. Fish and Wildlife Service's Modeling Framework for the Proposed Revision of Critical Habitat for the Northern Spotted Owl.

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(See Separate PDF File)