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**RE: Comments on Marbled Murrelet Technical Report Final**

Dear Ms. Weikel:

Please accept the following comments from Cascadia Wildlands, the Center for Biological Diversity, Defenders of Wildlife, the Oregon Chapter of the Sierra Club, Oregon Wild, Oregon League of Conservation Voters, and the Audubon Society of Portland on the Marbled Murrelet Technical Report Final. The above listed organizations have strong interests in the conservation and recovery of the marbled murrelet and its old-growth habitat in Oregon. We are hopeful that this document will set the ground work for meaningful regulations to facilitate the recovery of the murrelet.

Summary: The Report attempts to discourage the Board from utilizing “prescriptive approaches” to protect murrelet resource sites by dramatically over-complicating the Board’s responsibilities in this regard and repeatedly emphasizing the enormous amount of work this will entail. The Report stresses that the Board’s work will include: “defining suitable habitat for marbled murrelets,” “[i]dentification of key components for marbled murrelet resource sites,” “[d]efining the extent of habitat to be protected, and how it will be identified,” “[d]escribing forest activities to be limited or allowed within protected habitat,” “[d]efining the critical use period,” and “[d]efining the zone, within which forestry activities would be limited during the critical use period to avoid disturbing nesting birds.” All of this work has already been done by the Pacific Seabird Group (PSG), a professional society of murrelet experts that continually updates the standards of the protocol to reflect changing understandings about the species.

The Board should define murrelet resource sites as the “occupied stand” pursuant to the PSG Protocol, require operators to conduct Protocol murrelet surveys if they wish to log in murrelet suitable habitat (as defined by the Protocol), and prohibit logging in the resource site to prevent conflicts. This is the approach taken by all other federal and state agencies regarding murrelets. This avoids many of the steps described above in the Report, and dramatically simplifies this process for the Board. The PSG is a professional society of murrelet experts that specifically works to develop standards for land managers. This standard will not be overly burdensome, as very little murrelet habitat is being logged on private lands in Oregon because murrelets require

nesting structures and platforms that are rarely found in industrial plantations. This is the most-straight forward, scientifically sound approach for the Board.

Best Available Science: Repeatedly throughout the Report, the Department harps on the uncertainty or lack of information on a subject. The standard in statute is the best *available* science. Responsible agencies will never have complete information about a particular species, our understanding about species biology is constantly evolving and the status of species is constantly in flux. While it is appropriate for the Report to acknowledge areas where additional study is needed, it is inappropriate for the Report to defer recommendations or actions or refuse to represent the views of the best available science under the rationale that there are existing uncertainties.

Murrelet Biology: The Report states on Page 13 that: “Results of the McShane et al. (2004) appear to be in conflict with recent population trends from at-sea surveys (Pearson et al. 2018) which indicate an increasing population in Oregon and California.” First, the Pearson et al. 2018 study does not represent the latest and best available science on this front, the latest pop estimated (McIver et al. 2019) indicate the population has no trend in Zone 3 which is most of OR.

It is also scientifically inappropriate to draw conclusions from a select, limited time period (2000-2017) about the viability of a 100-year model that utilizes numerous other inputs aside from at-sea counts. Additionally, the Report fails to mention the acknowledged limitations from Pearson et al. 2018 which concedes that the population predictions do not take into account recently observed murrelet migrations which could be clouding the at-sea count results.

The Department also cites to a study from British Columbia on page 19 in the Report that “murrelets nesting near hard edges had greater nest success (Zharikov et al. 2006) than murrelets further in the interior” to assert that there is conflicting information regarding murrelet nest placement near forest edges. This is a gross misrepresentation of the study from British Columbia. Of 157 nests in British Columbia located by radiotracking (see next section), only 14 were located within 200 yards of a recent clearcut, of which 5 were within 20 yards. This does not show disproportionate usage of newly created edges at this scale. Any such attraction of murrelets to hard edges is of limited effect size. Many of these nests were also ground nests along British Columbia’s coastal cliffs which does not translate to the separate DPS in the Pacific Northwest.

The Report discusses high site fidelity by marbled murrelets on Page 23, which is widely recognized as a characteristic of the species but calls into question whether this is a defining trait of the species because of a lack of information about murrelet fidelity to a specific nest tree. Because murrelet occupancy is measured at the stand scale, it is largely inconsequential exactly what tree a murrelet uses to nest in a specific forest stand. Murrelet pairs have a home range and within that alternate between trees between years. That is fidelity.

PSG Protocol: Petitioners indicated in our comments on the draft technical report that the PSG Protocol is currently under revision, and the Department should update the Board on this process and its involvement, and the progress associated with that revision. This latest, best available information is not included in the Report.

As a part of this revision process in 2016, the US Fish and Wildlife Service's Lacey, Washington State Office funded Kim Nelson (Oregon State University) and Proteus Wildlife Research Consultants to conduct a new analysis of the survey effort required to achieve a given probability of detecting occupancy at an occupied murrelet site. The analysis updates the one done for the 2003 version of the ISP. The results of this new analysis are in the May 2016 report: "*Probability of MAMU Occurrence Reanalysis*" by Darryl MacKenzie, of Proteus Wildlife Research Consultants ("MAMU" is an acronym for Marbled Murrelet).

The new analysis differs from that of 2003 in several ways: (1) it included data collected by inland surveys through a longer period, from 1988 through 2014, (2) it used the relatively new "occupancy modeling" method, rather than the more traditional statistical analysis methods used previously, (3) it modeled occupancy separately for each of the 3 states (WA, OR, CA), (4) using a multi-state occupancy model, it tested the assumption of prior protocols that for an occupied "site", all survey stations within the site have an equal probability of detecting occupancy, (5) the occupancy analysis focused on data for "occupied" detections, while the previous analysis also used "presence" detections, and (6) due to software limitations, it only analyzed occupancy detection probabilities for a 1-year survey period.

The new analysis had two key findings, both of which indicate that the survey effort prescribed by the 2003 PSG Protocol is considerably lower than is now required to achieve the protocol's desired 95% probability of correctly identifying a truly occupied site:

(1) For a site with more than one survey station (which was more than half the sites in the dataset used by MacKenzie), not all stations within an occupied site are likely to have occupied behaviors observed. In effect, surveys at "unoccupied" stations within an occupied site do not contribute to the power to detect site occupancy, because there is no chance of those surveys detecting occupancy. For example, MacKenzie's analysis for Oregon found that the probability of detecting occupancy at a given station within an occupied site was about 50-60%. MacKenzie (2016) concluded that there was "very strong evidence" that probability of detecting occupancy is not equal among stations within an occupied site. To date, murrelet survey protocols, including the 2003 PSG Protocol, have assumed equal detection probability among stations.

(2) Detection probabilities declined between 1988 and about 2003-2005, then leveled out somewhat. Lower detection probabilities translate to requiring more surveys within a site to detect occupancy. MacKenzie conducted his analysis with 2 data sets: (1) inland murrelet survey results from all available years (1988-2014), and (2) inland survey results from 2003-2014. The latter focuses on surveys conducted under the current, 2003 protocol, which should be more standardized with reduced variability in survey design. Sample sizes were smaller for the 2003-2014 period, with Oregon having robust sample sizes, but not the other 2 states. Thus, the 2003-2014 Oregon data represented the most robust data set collected under the most standardized survey methods and was the data used to estimate survey effort for all three states. Thus, inclusion of survey data since 2003 increases the survey effort to achieve 95% probability of detecting occupancy at an occupied site. Under the simpler case of equal detection probability among stations (as assumed in the 2003 protocol), MacKenzie's analysis suggests at least 19 surveys may be required for a 1-year protocol. In the case of non-equal probability of occupancy among stations within a site, which MacKenzie and his results recommend, this number

increases to about 35 or more surveys per year within a site.

The Report also focusses heavily on the statistical analysis used in the 2003 PSG Protocol. The Report states that: “Thus, when using information derived from Pacific Seabird Group protocol surveys, only data at the scale of the Survey Station(s) and the Survey Site(s) would be based on the location(s) where murrelets were observed exhibiting occupied behaviors. Any additional Survey Sites and Stations (with probably absence or presence) within the larger Survey Area would be considered occupied based on extrapolation.” This is a misleading statement, and gives the “Survey Site” ecological significance which is baseless.

It is important to understand that “survey sites” within the larger survey area are sampling units that are intended to ensure full coverage and consistent detectability across the entire survey area (e.g., that a ridge line or other topography did not create “blind spots” that would compromise detections behind those features). Thus, the boundaries between survey sites within a survey area do not define the area that is used by marbled murrelets. Such boundaries between survey sites are not indicators of discrete habitat potential, or breaks in the forest, or delineation of the survey extent. The survey extent is defined by the survey area. Thus, per the PSG Protocol, a subcanopy detection in any one survey site would confer “occupied” status on the whole Survey Area. To reiterate, survey sites Survey Sites are an arbitrary designation. They have nothing to do with the sampling scale which is at the area scale not site scale.

Additionally, occupancy does not just refer to specific location of a nest site. It is also important to recognize that detecting occupied behavior does not necessarily indicate where the nest is located within the forest stand (although observed landings may be associated with a nest tree). Furthermore, if multiple observations of occupied behavior occur at a station or survey site, it is unknown whether these observations represent the same nest or multiple nests. Murrelet researchers have reported from personal experience observing a known nest (with video at the nest and observers on the ground below the nest during incubation mate exchanges) that other murrelets were nesting nearby, and that sub-canopy flights were not always immediately associated with the monitored nest, and some sub-canopy flights appeared to focus elsewhere in the stand and not immediately adjacent to the observed nest. Further, Burger et al. (2009) reported 18% of the nest trees that they found showed evidence of multiple nests in the tree. This further reinforces the consideration of the Survey Area as the occupied area because one than pair can be occupying the stand.

For all of these reasons, when a detection of occupied behavior occurs, the PSG protocol does not classify an area as a “nest site” with specific reference to the exact location of an individual nest tree. Rather, when a detection of occupied behavior occurs, the PSG protocol classifies an area more broadly as an “occupied site” to denote that the area “has some importance for breeding” (PSG Protocol, p.3).

The Report simply refers to the occupancy of the Survey Area as based upon an “assumption,” but this is not true. It based on the biological ways in which murrelets use the occupied area. Because of the great difficulty of identifying specific nest trees, the scientific community developed a protocol for surveying for murrelets in forests and for determining, based on the types of behaviors observed, whether a particular forest stand is used by murrelets for nesting or other breeding activities (Evans Mack et al. 2003) (hereafter “PSG Protocol”). This protocol was developed by the Pacific Seabird Group (PSG) and was last officially revised in 2003.

The PSG protocol does not define “use” by murrelets with absolute certainty, but rather it is a “probability assessment” based on the observation of specific behaviors and infers that when these specific behaviors are observed, there is a high likelihood that somewhere within that stand there is an active nest(s), a nest tree(s), or trees that are essential to the reproduction of marbled murrelets (e.g., courtship displays). The PSG protocol was developed (with open input from scientists and land managers) to identify stands that have important function to marbled murrelet reproduction.

The PSG protocol uses the observation of “occupied behaviors” to identify stands that are important to murrelet reproduction. Occupied behaviors include those behaviors observed below, through, into, or out of the forest canopy within or adjacent to potential habitat, and circling above the canopy. Flights from the ocean to the nest and back does not involve flight through the canopy except when the bird enters the nest stand where it must descend and maneuver to reach branch with the nest platform. Flying in the canopy requires avoidance of trees and their limbs. When departing from the nest they often drop to obtain air speed and must likewise maneuver through the canopy.

Prospecting birds must likewise enter the canopy to find a platform or to socially interact with birds already at a platform. This slower, maneuvering flight is also energetically more costly. Occupied behaviors also include perching, landing, or attempting to land on branches, or calling from a stationary location within the stand. The detection of occupied behaviors indicates that the stand has importance for breeding. (Note that the term “occupied behavior” should not be confused with the term “occupied” which is also used in the wildlife literature for work in distributional studies (see Mackenzie et al. 2005).

Resource Site Identification: The Report therefore places an unnecessarily heavy focus on the actual physical location of the nest, which is not relevant to the murrelet’s use of an occupied forest stand. The protection of a “resource site” is to ensure that forest practices do not lead to resource site destruction, abandonment or reduced productivity. OAR 629-665-0010. Regardless of where exactly the nest is located, which is not the goal of the PSG Protocol, the occupied “Survey Area” is critical to successful breeding and other reproductive behaviors like courtship.

The Report lists two options for defining murrelet resource sites as (1) Known nest trees or (2) Known nest trees and locations of occupied detections, but then acknowledges that this is not practical for murrelets as they are a species that are especially difficult to detect, particularly the nest tree. Also the Survey Station (or location where an occupied detection is made) does not translate into a nest site, so seems like this would be a poor way to identify a resource site.

The Report dismisses using the Survey Area as the Resource Site “because these larger polygons surrounding known locations are more suitable as a protection standard than as the resource site itself.” But practically, using Occupied Surveys Areas as the resource site works perfectly and minimizes work required by the Department and the Board. Murrelets use occupied forest stands not only for nesting but also for other associated breeding activities like courtship. This is the very reason that the PSG Protocol protects contiguous forest stands, due to the species use of the stand for breeding purposes, including shielding the nest from weather and predators. Given that the “goal of resource site protection is to ensure that forest practices do not lead to resource site destruction, abandonment or reduced productivity,” OAR 629-665-0010, and logging in an

occupied stand impedes breeding and harms murrelets under federal law, designating the occupied stand as the resource site makes the most sense under the agency's regulatory scheme.

It also dovetails nicely into the existing laws concerning resource sites and affected operators. ORS 527.670 requires operators to coordinate with the Department on logging planned within 300 feet of a resource site. The Fish and Wildlife Service generally use 330 feet from the edge of an occupied forest stand as a range for determining whether or not a logging activity will disturb breeding murrelets. The Department indicates that "Possible options for habitat protection might range from a fixed buffer around a known point location to identification of a polygon of habitat. Both would need to include adequate habitat area to protect the site(s) to avoid a conflict (i.e. site abandonment or reduced productivity)." However, by designating the occupied stand as the resource site, this second step can simply be avoided. Pursuant to the PSG Protocol, federal law, and the best available science, logging within occupied forest stands reduces marbled murrelet breeding success. The Board's protective standard can simply preclude logging activities within the occupied stand (i.e. Survey Area) or a certain distance from the occupied stand.

The most straightforward approach here is to simply require operators to conduct PSG Protocol surveys if they are logging within suitable murrelet habitat, which the PSG Protocol defines, and require them to protect occupied stands. Given the size requirements around private logging operations, there will be no confusion around survey area of survey site, because "When the survey area is small (< ~61 ha) [150 acres], the site encompasses the entire survey area." PSG Protocol at 7. Given that logging operations are limited to 120 acres in size, this makes the survey process simpler for operators and eliminates any ambiguity identified by the Department in the relationship between the survey site and survey area.

In short, there is an already established survey protocol for murrelets used by every other agency that delineates suitable habitat, provides guidance on determining whether or not murrelets use the forest stand for breeding, and establishes clear straightforward rules for preventing logging activities from reducing productivity of the site. It is simply unnecessary for this Board to reinvent the wheel, and this Protocol is developed by the Pacific Seabird Group, a society of professional murrelet researchers and managers that uphold an incredibly high standard of scientific integrity and utilize the best available science.

Thank you for the opportunity to submit these comments. We would be more than willing to meet with Department staff to discuss this matter and the process further.

Nick Cady, Cascadia Wildlands