

State Forests Program
Oregon Department of Forestry

Marbled Murrelet
Guidance Document

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1.1.G1 Marbled Murrelet Guidance Document

G1.1.1 Introduction

This document describes guidance that State Forests Program employees are encouraged to consider when preparing for and conducting management activities per State Forests Program *1.1.0 Marbled Murrelet Operational Policies* and associated procedures.

G1.1.2 Survey Standards

The State Forests Program's survey standards are based on the protocol developed by Evans et al. 2003 of the Pacific Seabird Group (PSG), which includes direction for surveying and guidance for interpreting survey results. The PSG protocol "is based on an analysis of 10-years of data to provide a statistically-reliable approach to classifying surveyed areas." The PSG protocol document recognizes that "a protocol aimed at many different users for a variety of purposes cannot cover all possible scenarios," and that "this protocol is to be used hand-in-hand with additional requirements attached by state, provincial, or federal agencies." The State Forests Program's policies, procedures, and guidance describe how the Program will apply the recommendations in the PSG protocol document and address scenarios not covered within the PSG protocol document, such as waiving surveys for certain activities, conducting surveys to verify murrelet occupancy, designating marbled murrelet management areas, and classifying occupied sites as historic. The PSG protocol document provides a discussion of the Group's rationale and recommended guidance, which is available for viewing at: http://www.pacificseabirdgroup.org/revMAMU_ISP_Jan_03.pdf.

1.1.G1.1 Guidance for Identifying Survey Needs

See operational policy statements 1.1.3.1 through 1.1.3.3, procedure 1.1.P1.1, and forms 1.1.G1.F1 and 1.1.G1.F2.

The State Forests Program determines when to conduct surveys by identifying whether potential habitat (definition 1.1.7.14) is inside of an operation or activity, or adjacent to the operation or activity boundary. Adjacency is defined as being within 330 feet of the operation or activity, or within 330 feet of another patch of potential habitat that itself is within 330 feet of the operation. This chain of contiguity extends out to 0.25 miles from the boundary of the operation or activity of an operation or activity (operational policy 1.1.3.1). It is recommended that the Unit Forester consult with the Area Biologist enough in advance of a harvest- or management-related activity to accommodate two years of protocol survey, if needed. Additional guidance intended to assist program employees in making this determination is provided below, and a form for documenting discussion and decisions related to this task may be found in Appendix D.

G1.1.1 Determining survey needs within the North Coast Survey Zone

As noted in definition 1.1.7.14, the State Forests Program has established a standard for potential habitat that is stricter in the North Coast Survey Zone (NCSZ) compared to the standard outside of this area. The North Coast Survey Zone is an area determined by ODF biologists to need a different standard to trigger surveys because it is more likely that murrelets would nest in a single platform tree in this area than in other areas where surveys are conducted. This determination is based on data on murrelet nesting in the North Coast. When determining the need to survey a stand with a

single suitable platform, tree, a State Forests Program wildlife biologist should consider the following factors:

- **Number of platforms.** Trees with less than 7 platforms may have limited nesting potential for murrelets. This is probably the most reliable metric in determining the suitability of any given tree, given its significance at the individual tree level in the above research (Nelson and Wilson, 2002). It is also the only one of the individual tree metrics that can be easily ascertained from the ground.
- **Degree of emergence of the platform tree.** Where the potential platforms of a tree are emergent above the remaining canopy (e.g. a residual old-growth tree in a 10 year old plantation), the lack of adjacent canopy cover may reduce the suitability of those platforms for nesting.
- **Moss depth.** Trees with no moss or a thin (i.e. less than 2 cm) covering of moss on the limbs overall may have reduced suitability for nesting murrelets.
- **Other factors that are significant at the platform level,** such as the amount of vertical and horizontal cover around the potential platforms, and the percent moss and moss depth on platforms. These parameters have a range that includes zero, and are difficult to ascertain from the ground, so their utility may be limited.

These factors are based on results presented in Nelson and Wilson (2002), particularly on their findings relative to the difference in nest and non-nest trees (and their platforms). Consideration of these factors accommodates the most marginal situations where nests (and occupied behavior) have been found to date.

This evaluation was developed for the NCSZ to keep from automatically triggering surveys for situations such as a single tree standing in the middle of a plantation. It is not practicable outside of that situation for two reasons: 1) where potential habitat trees are embedded in a stand of non-habitat of co-dominants, the crown of the potential tree will probably not be visible enough to perform an adequate evaluation; and 2) this process will be very time intensive outside the NCSZ (where there would be at least five potential trees to evaluate).

G1.1.2 Guidance for Granting Survey Waivers

When determining if an operation qualifies for a survey waiver, the Area Biologist should consider the following guidance.

G1.1.3 Planned Harvest Activities

Some planned harvest operations that do not contain suitable habitat, but are within 330 feet of a suitable habitat patch, may be designed to have little or no impact to the habitat patch in question depending on site-specific factors. The Area Biologist will visit the site when needed to determine what if any design considerations might eliminate the need for a survey (see 1.1.P1.2). If the biologist determines that local factors combined with operational considerations may reduce or eliminate any risk of adverse impacts to marbled murrelets that may be using habitat in the vicinity of the sale, then surveys of the potential habitat may be waived. Factors to consider include:

- ♦ *Local topography* – A ridgeline may, in specific instances, serve as a buffer between potential habitat and harvest operations.
- ♦ *Seasonal and daily timing restrictions* – When operations are conducted outside of the breeding season, the potential for disruption of breeding activities may be considerably

reduced or eliminated. For some sites, the risk of disrupting breeding activities may be lessened or eliminated through restricting activities to occur after dawn and before dusk, the periods when murrelets are most commonly active at nest sites. The effectiveness of these types of restrictions is likely to be affected by the physical location of the habitat patch relative to the sale.

- ◆ *Operational Considerations* – Operations not located adjacent to a habitat patch may nevertheless impact suitable habitat trees through factors such as placement of cable layouts and yarding corridors. Elimination of these potential impacts is likely to reduce the risk of impacts to murrelets.
- ◆ *Management Prescription* – Consider to what degree the operation will alter the stand and any potential habitat located in the vicinity. If the harvest prescription could significantly alter the microclimate or increase the chance of windthrow in potential habitat, surveys may be needed.

G1.1.4 Other Activities

Other activities may be considered for a survey waiver, including those listed in 1.1.P1.2. ODF generally considers these activities to have fewer potential negative effects on adjacent suitable habitat, and will only need to be considered for survey if they directly impact a potential habitat patch. This will be an Area Biologist's professional judgement per 1.1.2.5 and be based on the scale of such activities compared to a timber sale. In some cases, some sort of modified survey protocol design that incorporates protocol survey and tree climbing techniques on a limited scale might be employed. In assessing the utility of surveying, biologists may consider:

- ◆ *Suitability of the habitat* – Is the activity located near other areas occupied by murrelets? Does the habitat resemble murrelet occupied habitat areas elsewhere? Is the activity in the North Coast Survey Zone (See guidance G.1.1.1)?
- ◆ *Scale of the activity* – Is this a smaller scale operation in which only a few trees will be removed or a larger operation that will affect many trees, or occur over a larger area or longer time period?
- ◆ *Likelihood of negatively affecting murrelets* – Surveying is generally recommended when the activity will remove potential habitat trees or affect the environment around potential habitat trees. In other situations, survey waivers may be appropriate.
- ◆ *Other relevant factors* – Other factors to consider include whether the proposed activity may result in circumstances that attract potential corvid predators, such as increased human activity and garbage, or whether the proposed activity involves high levels of noise or vibrations, especially during the times of day when murrelets are most active.

Documentation of these decisions may use form 1.1.G1.F2 found in Appendix D.

1.1.G1.2 Guidance for Conducting Surveys

See operational policy Statements 3.4 through 3.8, procedure 1.1.P2.0, and form 1.1.G1.F3.

Murrelets are extremely difficult to find, requiring the interpretation of observed behavior to help determine if potential habitat is likely to be occupied. Subcanopy behaviors have been documented at active nest sites and can be observed during an audio-visual survey, providing the rationale for using them as indicators of occupancy. Even when these behaviors are not directly observed to be associated with attending an active nest, they may still be indicators of past or future breeding

activities, such as prospecting for nest sites, or maintaining familiarity with a historic nesting area (PSG 2003). In addition to subcanopy behavior, landings, and circling and above canopy flights, and vocalizations are used to determine whether or not potential habitat is occupied.

In most cases, surveys are to be conducted exclusively on ODF-managed lands. However, in some cases, ODF-managed lands are intermingled with lands managed by federal agencies such as the BLM and U.S. Forest Service. If these areas have not already been surveyed by the federal agency, ODF will in most cases conduct surveys on these lands where the discovery of an occupied site has the potential to influence a harvest activity. ODF will not conduct surveys on lands owned by private individuals or companies.

The following guidance provides direction in addition to the requirements in policy statements 1.1.3.4 through 1.1.3.8 to assist in designing and implementing effective surveys.

G1.2.1 Preparing for and Coordinating Survey Activities

G1.1.5 Scheduling Surveys

When scheduling surveys, the following should be considered:

- Visits should initially be scheduled between May 1 and July 31, so that the period of August 1 to August 5 may be used to accommodate unanticipated additional surveys.
- Most often it will not be possible to put exactly half of the visits before or after June 20 (per 1.3.5.6), since most sites will have either five or nine visits. It is acceptable to have the greater number of visits prior to June 20 (i.e. three of five, or five of nine visits). However, the minimum of two visits during the peak period must be adhered to.
- Regularly scheduled surveys are to be spaced more than six days apart, but not more than 30 days. Where presence is detected at sites with only five scheduled visits, it is acceptable to schedule four visits within a compressed time frame. However, each of these visits must still be separated by at least two days.
- Where nine visits per year were originally scheduled, it is acceptable to only schedule five visits during the second year provided there were no detections during the first year and the District T&E Coordinator feels that there is very low risk of detections during the second year (referred to as the “stopping rule” in the PSG Protocol.). It is important to schedule the five visits so that they meet the protocol distribution, but also allow sufficient time to “add back” four visits, should murrelets be detected during the second year. This is only to be done at the request of the District T&E Coordinator. The District T&E Coordinator should consult with the Staff Biological Specialist prior to doing this.

G1.1.6 Determining Survey Site Layout

If there is potential habitat inside the sale area or within 330 feet of the sale boundary, then all patches of potential habitat within 330 feet of the sale boundary, or contiguous to that habitat should be surveyed, up to 0.25 miles from the sale boundary. Note that this creates a “chain” of contiguity, where a patch may be “contiguous” because it is within 330 feet of a patch that is in turn contiguous to another patch that is actually in or within 330 feet of the sale area. An entire patch need not be within 330 feet of the sale or another patch to be considered contiguous; if any portion of the patch is within 330 feet, it is contiguous. In the North Coast Zone, this will include all individual trees within 0.25 miles of the sale boundary, unless deemed unsuitable by the wildlife biologist. Please be very aware of this difference between what triggers a survey (i.e. within 330 feet) and what to

include once a survey is triggered (i.e. contiguous habitat within 0.25 miles). Patches and individual trees may be grouped into a single site, as long as the area encompassing all patches does not exceed protocol maximum suggested size (140 acres). Intervening unsuitable habitat within such a site does not need to be surveyed, but may be in some cases as determined by the District T&E Coordinator .

Examples of acceptable site layouts are given in Appendix B1 and B2. These examples show two situations: one that pertains to surveys in the North Coast Zone, and one that pertains to the general potential habitat definition. Obviously, these figures will not speak to all situations, and district T&E survey coordinators should consult with the area or staff wildlife biologists, or the staff biological specialist in ambiguous circumstances. These examples are shown with 30-acre circles (645-foot radius) around stations. Please keep in mind that topography will greatly alter the valid survey area around a station and plan accordingly. The Pacific Seabird Group protocol also discusses this issue.

G1.1.7 Establishing Survey Stations

Survey station placement is one of the most crucial aspects of survey implementation, and will adhere to policy 1.1.3.5. The following bullets contain recommended techniques and considerations for determining where to locate stations:

- Use aerial photos or topographic maps to determine adequate coverage and establish preliminary station locations. Using these tools, topography, openings or gaps, habitat patchiness, and natural and artificial flight corridors can be identified.
- Locate the stations on the ground and refine their placement based on site-specific factors. Openings not detected by the photos, sources of loud noises, growth and foliage of adjacent vegetation, and viewing window can be considered. Viewing against a light or bright sky may help silhouette the bird in the sky.
- Consider adding new or supplementary stations to better survey a stand in a difficult setting. These can be added after surveys have begun, where detections indicate potential activity in an area receiving minimal coverage. Under ideal conditions one station may be able to cover 30 acres. However, the presence of ridges, streams and steep slopes has in some cases decreased survey effectiveness down to a station density of 1 per 17 acres.

The Pacific Seabird Group has identified several important recommendations regarding survey station placement that have been incorporated into the program's operation policy, or that should be considered when laying out survey stations:

- Place at **least** one station per 30 acres; in almost all cases you will need more.
- Distribute stations **throughout** the site. If a site includes a ridgetop, mid-ridge and river bottom, a station **must** be placed in a manner that **covers all those areas**. In most instances it will not be acceptable to survey from only one side of the site, and it is unacceptable to survey sites only from roads. If there is a river or creek in the site, place a station in or adjacent to the river or creek despite concerns about noise.
- Locate stations in an opening if possible, but distribution of stations throughout the site is equally important; therefore, some stations may be located in areas without excellent viewing opportunities.
- Place stations within patches that contain the most suitable characteristics for nesting when surveying a heterogeneous site, while also maintaining appropriate station distribution.

G1.2.2 Verifying Subcanopy Behaviors

Subcanopy flights are one of the observable behaviors used during surveys because they usually, but not always, indicate site occupancy by murrelets, including those that are below, through, into, or out of the forest canopy within or adjacent to potential habitat. Below canopy flights, often along a route of gaps or other “natural” corridors, are associated with adults flying to nests. Arrival and departure paths may differ, as well as the flights of each bird in a pair. The birds may engage in a ‘fly-by’ below the canopy at nest height before and after visits to the nest. Subcanopy flights are often non-vocal but can include wing-beat or “jet” sounds, and usually consists of one to two birds.

However, some flights observed below the canopy are not indications of occupancy. Low-flying birds have been observed in steep canyons, crossing ridgelines in non-habitat areas and just above riparian corridors on foggy or overcast mornings, which would not be considered indicative of occupancy. In general, subcanopy flights in areas lacking potential habitat are not an indication of occupancy. According to the PSG protocol, an occupied site is a site where at least one subcanopy behavior is observed. However, the PSG protocol recognizes that:

“Some flights that are observed below the canopy, and thus technically ‘subcanopy’ behaviors, are not indications of occupancy. For example, murrelets en route to nesting areas in the Santa Cruz Mountains flew quite low (just above the top of riparian hardwood trees) when following stream channels inland, particularly on foggy or heavily overcast mornings (S. Singer pers. comm.). In addition, low-flying birds have been observed in steep canyons or crossing ridgelines in non-habitat areas (S. Singer, pers. comm.; C. Smith, pers. comm.). In general, if subcanopy flights are seen in areas lacking potential habitat, they are not an indication of occupancy.”

G1.1.8 Factors to Consider Prior to Requesting Verification Surveys

To assist in gaining a better understanding of a reported observation, “subcanopy behaviors” reported by the Program or its agents may be verified upon District request per policy 1.1.3.6, and evaluated per 1.1.3.9. The Program’s experience with murrelet surveying and observation of subcanopy behaviors has identified several factors that may be considered by the District when determining whether to request verification surveys. The primary reason for requesting a verification survey would be when the subcanopy behavior was observed in an area that appears to lack appropriate habitat. Some other factors that may create doubt about the observed behavior include the following:

- Unfavorable weather conditions that create poor visibility;
- Unfavorable position of a survey station, such that it is unclear whether the observed murrelet was flying into a stand or over it;
- Unclear behavior of the birds, particularly if the observation was made at or near canopy height; and
- Surveyor inexperience and/or uncertainty that the observed bird was a murrelet.
- The proximity of the survey station to the known occupied habitat – What is the likelihood that the observation is associated with the known site, rather than the potential habitat the survey was designed to cover?
- The number and type of detections – This may be the only subcanopy detection, but are there other observations of presence that would lead us to expect that murrelets are using habitat in the area (including the site in question)?

In addition, Districts may request verification surveys if they desire to gain more specific information about the location of the subcanopy behavior to assist with later MMMA designation. In most cases, verification surveys would not be requested for areas where there appeared to be a clear indication of occupancy, such as definitive observations of murrelets below the canopy in potential habitat.

G1.1.9 Rationale for the Number of Verification Survey Visits

The rationale for the defined number of survey visits in operational policy 1.1.3.6 is an attempt to add an additional degree of certainty to the reported subcanopy observation based on our experience in “following up” such observations in the past. An analysis of survey data collected by ODF between 1992 and 2002 indicates that 72% of the time, a second observation of occupied behavior occurred on the first survey visit following an initial observation of “occupied behavior” during the same year. Occupied behavior was re-observed 92% of the time by the third follow up survey visit, 94% of the time by the fourth visit, and 98% of the time by the fifth visit. The thirteen visit requirement for verifying a reported observation represents the nine required by 1.3.6.2 plus four additional visits, a number that this analysis indicated would provide a reasonable opportunity of re-observing the behavior.

Subcanopy behaviors may be observed at some sites more than once during the initial nine (or fewer) visits, thus accomplishing the verification of subcanopy behaviors without four additional visits (or even all of the initial nine). Given the low success rate for initially detecting the occupancy condition when it exists (i.e. the reason behind the PSG protocol nine visits), an additional four visits will not always result in additional observations of subcanopy behavior at occupied sites. However, we have had relatively good success in the past in making additional observations of subcanopy behaviors when the initial detection is followed up quickly.

Still, the additional four visits are not based on a rigorous analysis of a data set. In order to reduce the risk of erroneously interpreting the lack of additional observations to mean a lack of occupancy, the Area Biologist should consider other logical reasons that murrelets would not be breeding in the area, such as a clear lack of potential habitat.

G1.2.3 Using Tree Climbing as a Survey Method

Due to the lack of a statistically defensible protocol for using tree climbing to survey for marbled murrelets, the State Forests Program will only employ this method following discussions with USFWS, using guidance from a letter issued by the PSG Marbled Murrelet Technical Committee (see Appendix E). In accordance with that letter and the Program’s overall objectives, tree climbing will not be used when a significant amount of potential habitat is involved. Instead, protocol surveys will be implemented. In some cases, some sort of modified survey protocol design that incorporates protocol survey and tree climbing techniques on a limited scale might be employed. Form 1.1.G1.F3 should be used to document data resulting from tree climbing.

1.1.G1.3 Guidance for Evaluating Observed Murrelet Activity

See operational policy statements 3.9 through 3.11, procedure 1.1.P3.0, and forms 1.1.G1.F4, 1.1.G1.F5, 1.1.G1.F6, and 1.1.G1.F7.

G1.3.1 Evaluating Survey Results and Classifying Sites

The Area Biologist will review all relevant data per 1.1.3.9 when evaluating murrelet activity, including: all survey results obtained per 1.1.3.5, 3.6, 3.8, 3.11, and 3.17. These evaluations will be collaboratively conducted with the District T&E Coordinator, Staff Biologist, and Staff Biological Specialist. The Area Biologist may consider inviting the participation of the Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Services in these year-end survey reviews, as appropriate. The survey review group will utilize guidance from this document, from the PSG protocol (*Interpreting Survey Results to Classify Survey Sites and Areas*), and professional judgement when classifying sites and/or developing recommendations for additional surveys. If some question exists about the true status of the site, additional surveys may be recommended before classifying a site. Should a situation arise where agreement on a classification can not be reached within the group, the Staff Biologist will make the final determination. These classifications will be forwarded to the District Forester for review, along with the survey recommendation for approval.

Forms have been developed for use in documenting survey results, and recommendations for site classification and/or additional surveys (see Appendix D). The site classification tracking form is useful for summarizing these determinations, and can assist in developing an annual survey report for program review and posting to the web. The marbled murrelet timber sale tracking form may be used to document recommendations made during the annual meeting to review survey information. This form summarizes survey results and is useful for determining if individual timber sales have had surveys to meet protocol standards. The site classification and MMMA designation form is a convenient way to document all known information about those sites classified as occupied and subsequently designated as a MMMA.

Appendix F includes an example of a annual survey summary to be developed by the Area Biologist and collated by the Staff Biologist. This annual report collates the survey summaries by District provided by the Area Biologist and District Forester decisions. The Staff Biologist will coordinate distributing this annual report to the program's leadership and posting it to the internal Technical Services Unit web page.

G1.1.10 Classification Types

Occupied Sites

The observation of the following behaviors should be evaluated for potential classification of occupied sites. Format 1.1.G1.F6 should be used to document classification of all sites where these observations have occurred.

- Subcanopy flights below, through, into, or out of the forest canopy within or adjacent to potential habitat, which are generally indicators of occupancy.
- In general, if subcanopy flights are seen in areas lacking potential habitat, they are not an indication of occupancy.
- Murrelet landings in trees are strong indicators of occupancy. In addition to landing at active nests, murrelets have been observed landing in trees near known nests throughout the breeding season, or in trees with nests that were active in a previous year (Nelson and Peck 1995). Murrelets also land in trees prior to egg laying, presumably to inspect potential nest sites (Nelson and Hamer 1995) and to copulate (D. Buchholz, pers. comm.). Landings also may indicate territorial behavior, resting or roosting (Naslund 1993b).

- Circling and other above-canopy flights, such as dives, indicate possible occupancy of a site (reviewed by Nelson and Hamer 1995). These behaviors are a red flag that should prompt additional survey effort to observe subcanopy activity.
- Of the non-vocal sounds heard during surveys, wing sounds can be detected from murrelets flying nearby, and ‘jet sounds’ are associated with dives, which can be associated with nests.

Presence

The observation of the marbled murrelets not exhibiting any of the previous behaviors, but flying or circling above canopy, or the observation of vocalizations only, will generally lead to the classification of presence once the requisite number of surveys have been completed.

Probable Absence

A site where no murrelets were detected after the requisite number of surveys would be classified as probable absence.

Not Verified

A site where subcanopy behaviors were observed, but could not be verified after the requisite number of verification surveys would be classified as occupancy not verified. The Area Biologist may recommend additional surveys prior to classification as not verified.

Historic

A recommendation to re-classify an occupied site previously designated as a MMMA to a historic site will generally occur once subcanopy detections or other evidence of nesting have not been confirmed during the requisite number of surveys. However, the following other factors also may be considered when making a recommendation regarding classification as historic.

- Other detections. If there have been instances of numerous, multiple, and/or loud vocalizations associated with the MMMA in question, or instances of circling observed during the re-evaluation surveys, this data may indicate the site continues to have importance for breeding murrelets.
- Location of MMMA. Is the MMMA isolated, or is it located near other occupied habitat? Location near other occupied habitat may affect the number and type of murrelet detections observed.
- Location of nests. If tree climbing has occurred in the MMMA in question, and old nests have been located, this also may indicate that the area still has importance for breeding marbled murrelets.

G1.1.11 Additional Surveys

Additional surveys may be recommended if the appropriate site classification is not clear, even after the requisite number of surveys has been completed, including verification surveys. Some considerations that could lead to a recommendation of additional surveys include:

- Nature or type of the detection, e.g. numerous presence detections with lack of subcanopy observations; circling behavior; numerous audio detections but no visual observations;
- Confidence of the surveyor/confidence in the surveyor;

- Dates when surveys were conducted; and
- Conditions during follow-up surveys.

G1.3.2 Evaluating Murrelet Activity Observed Outside State Forests Program's Surveys

Occasionally, evidence of activity resulting from observations outside the State Forest Program's protocol surveys will arise. The District T&E Coordinator and Area Biologist will evaluate the available information to determine if the observation is credible and warrants additional surveys per policy 1.1.3.11 and Procedure 1.1.P3.2 and considering the following guidance. Form 1.1.G1.7 has been developed for use in documenting important information associated with and the outcomes of these evaluations (See Appendix D).

Interviews and potential additional surveys are required only for reported significant detections in areas that have the potential to impact a harvest-related activity, and that have been reported by a certified survey (per 1.1.3.11). The District may choose to follow up on other credible reports of murrelet activity not related to harvesting, but this is not required. Upon receiving notification of a significant behavior detection from a certified murrelet surveyor, the District T&E Coordinator and Area Biologist will interview the surveyor at the survey location as soon as possible after receiving the notification and evaluate all available information regarding the observation. This information may include, but is not limited to:

- physical evidence (nest, eggshell fragments)
- location, time, date of observation
- number of birds, height of bird(s), initial and final flight direction,
- suitable habitat in vicinity of location
- behavior of the bird(s)
- past survey information (if available)
- confidence in the surveyor (may include confirming the surveyor's certification credentials with the agency or firm that conducted the testing)
- observation conditions

The Area Biologist will develop a recommendation suitable to the situation and site based on the available information. This recommendation may include a proposal to conduct additional surveys, and/or to implement other reasonable measures. The District Forester has a responsibility to assess the level of risk and determine the appropriate course of action, which may include (but does not require) a decision to stop an operation.

G1.1.12 Rationale for Number of Survey Visits

In situations where observations of murrelets are reported by surveyors outside of State Forests Program surveys, and the District T&E coordinator and Area Biologist have determined that the observation warrants follow-up, five follow-up visits will be conducted. A minimal survey effort according to the PSG protocol includes five visits a year for two consecutive years. Conducting five follow-up visits leaves open the option of completing a protocol visit by conducting five visits the following year, if this course of action is deemed to be appropriate.

1.1.G1.4 Guidance for Designating Marbled Murrelet Management Areas

See operational policy statements 3.12 through 3.13, procedure 1.1.P4.0, form 1.1.G1.F6, Appendix C and Appendix G.

The establishment of MMMA boundaries is very site-specific, and will be documented and retained, along with supporting information, using form 1.1.G1.F6 and the format given in the example in Appendix G. The goal of establishing a MMMA is to maintain habitat suitable for successful nesting in the occupied site. The primary factors considered are the location of habitat and topography. Examples of MMMA layouts can be found in Appendix C. The following should be considered when establishing MMMA boundaries:

- When occupied behaviors are observed during protocol surveys, the design of the survey determines the area to be classified as the occupied site (PSG protocol also provides guidance in this regard). The reason for this is that the requisite number of surveys to meet the survey requirements are applied to the survey site. Because of this sampling design, classifications are applied to the sites as they are surveyed. If the site is changed, then the protocol may no longer be met. The occupied survey site then provides a place to begin determining the boundaries of the MMMA. In many cases, the MMMA will incorporate the entire survey site. However, in some cases, portions of the survey site may be excluded from the MMMA when logical topographic or habitat breaks occur within the survey site. In cases where portions of a survey site fall outside of a MMMA boundary, no management activities may proceed in the excluded area without additional protocol surveys because these areas no longer comply with the protocol.
- In cases where murrelet nest locations are known, or murrelet occupancy has been discovered in some way other than through a survey, the location of the nest or occupied behavior provides the starting point for determining the area to be included in the MMMA.
- The location of potential habitat is another consideration for determining MMMA boundaries. MMMA's should incorporate potential habitat that is considered to be the most likely location for nesting sites, based on information from the surveys, aerial photos, stand information, and judgment of biologists or others familiar with the area. Stand type breaks or topography (see below) may be used to delineate the boundaries of this likely nesting habitat.
- The MMMA also should include a buffer to the likely nesting habitat (see 1.1.G1.5.1) where appropriate. The purpose of the buffer is to maintain the integrity of the occupied stand from windthrow or other environmental disturbances, as well as to provide protection from potential predation. Several studies have noted a relationship between the distance from an edge and nest success. Researchers have found that nests located further from stand edges (at least 170 feet or 50 m from the edge) are more successful than those located closer to stand edges, and that nests 150 m (500 feet) from a stand edge were successful or failed from reasons other than predation (Raphael et al. 2002). Adequate buffering to the likely nesting habitat may be provided by topography (see below) as well as by additional forested stands that may or may not contain potential habitat.
- Topography is a key consideration for determining MMMA boundaries. Ridges provide environmental buffering of occupied sites as well as functioning as easily located operational boundaries. Streams also provide easily located operational boundaries and may make sense as boundaries especially if there is a change of habitat type at the stream buffer boundary.

- There is no guidance for the size of a murrelet management area. No statistical relationship between murrelet occupancy and stand size has been found (Weikel 2003). The size of any individual MMMA will vary depending on site specific conditions from tens to hundreds of acres. MMMA's may incorporate more than one occupied site, and consequently be larger than many MMMA's that protect a single occupied site.

1.1.G1.5 Guidance for Protecting Occupied Sites

See operational policy statements 3.14 through 3.16, procedure 1.1.P5.0, and form 1.1.G1.F8.

G1.5.1 Developing Prescriptions for Management Activities in a MMMA

Every MMMA is unique and there is no standard prescription for management activities in MMMA's. In general, management activities in MMMA's need to be consistent with the overall policy objectives of maintaining habitat suitable for successful nesting and minimizing the disruption of reproductive activities in marbled murrelet occupied sites (policy objectives). Therefore, decisions to conduct management activities in, or within the vicinity of, a MMMA should be carefully considered, and involve the Area Biologist. Because little is known about the impacts of management on reproductive activities and successful nesting, a cautious approach should be taken that is based in adaptive management principles. This might include limiting the amount of activity that occurs in proximity to and within a MMMA, limiting activities to the buffer on the likely nesting habitat, identifying in consultation with the Monitoring Coordinator whether a monitoring project would be appropriate, and then periodically reviewing all available data and information to identify adjustments to future management actions if needed. In addition to a MMMA, this guidance should also apply to operations adjacent to occupied sites on other landowners. Form 1.1.G1.F8 should be used to document factors considered in developing prescriptions for harvest activities within MMMA's.

G1.1.13 Maintaining habitat suitable for successful nesting

In designing appropriate management prescriptions within MMMA's, consideration should be given to the best available information about the characteristics of marbled murrelet habitat. Weikel (2003) summarized information to date in a literature review for ODF:

Although the species of tree most frequently used varies depending on geographic context, murrelets usually select tall (often > 20 m), large-diameter trees (often > 100 cm dbh) with many potential nesting platforms (often > 4 platforms), and abundant cover of moss or other epiphytes (Table 1) (Manley et al. 1999, Burger 2002, Conroy et al. 2002, Nelson and Wilson 2002). In most regions, nests have been found only in mature or old-growth trees (Nelson 1997), however murrelets are known to nest in younger trees with platforms created by mistletoe or witches brooms in the northern Coast Range of Oregon (Nelson and Wilson 2002), and nests have been found in trees as small as 27 cm in diameter. The presence of canopy gaps has also been shown to influence nest site selection (Manley et al. 1999). In his review of existing literature on nest trees used by murrelets across their range, Burger (2002) noted that given a choice, it appears murrelets select nest trees with the following characteristics: 1) sufficient height to allow stall-landing and jump-off departures, 2) openings in the canopy for unobstructed flight access, 3) sufficient diameter to provide a nest site and landing platform, 4) some soft substrate to support a nest cup, and 5) overhead foliage cover.

There is additional information in this literature review about habitat at different scales, and more recent or local information should also be consulted.

Factors to Consider when Developing Prescriptions:

Habitat:

- ◆ Is the operation proposed in a block of contiguous suitable habitat, or in a stand where murrelet habitat occurs at the patch level? In general, management prescriptions are more likely to be appropriate where murrelet habitat occurs at the patch level.
- ◆ Is the predominant habitat mistletoe-infected hemlock, or large, moss-covered limbs?
- ◆ Has the stand had previous management activity?
- ◆ What species are present in the stand?

Proposed Activity:

- ◆ Does the sale include potential or suitable habitat, or does the proposed management activity occur in the MMMA but outside of suitable habitat?
- ◆ Is the proposed prescription a clearcut or a partial cut? Clearcutting adjacent to nesting habitat patches has the potential to increase predation on nesting murrelets. Existing information indicates thinning doesn't increase populations of potential predators (jays and crows) in the short-term; however, operations designed to enhance layering in a stand have the potential to result in a long-term increase in predator populations since Steller's jays may nest in understory hemlock trees.
- ◆ How much activity has occurred recently that has the potential to affect this particular MMMA? Planning numerous operations in close proximity to, or within, a single MMMA over a short period of time (<10 years) is discouraged.

Survey Information:

- ◆ What do recent murrelet surveys indicate about use of the stand? In general, operations should not be pursued where there is no information on the activity level within a stand. Operations proposed where murrelet activity has been low and infrequent are more appropriate than where murrelet activity has been high or frequent.

Management Prescription Guidance

Prescriptions developed for operations within MMMA's should be consistent with the following guidance:

- ◆ *The removal of or damage to murrelet nest trees* should be avoided by identifying and posting suitable habitat trees (trees with existing high quality platforms and good access). Further assurance can be provided by posting non-habitat buffers around the suitable habitat patches.
- ◆ *Cutting within the habitat niches* should be avoided except where habitat is developing and of low quality, and where survey data indicate murrelets haven't been active in several years.
 - Post area boundaries around developing and low-quality habitat and mark individual trees for removal, with the goal of increasing limb growth, within-tree cover, access, etc..
 - To facilitate development of habitat trees in low quality habitat, consider opening areas to a wider spacing (at the micro-site) in order to provide sufficient space for crown and platform development.

- ◆ *Potential nest trees* should be protected outside of the marked suitable habitat patches by measures such as prohibiting cutting of trees with limbs >5” or providing an upper diameter limit.
 - Identify trees with developing nesting habitat structure and mark individual trees for removal to open the crown of the developing trees on 1-2 sides, thus allowing the continued development of large platforms and nest cup cover around the platforms.
 - Consider future murrelet access corridors into the developing nest trees when marking trees for removal.
 - Consider the potential for adjacent trees to provide cover to nest platforms (compared to the benefit of removing the tree to stimulate branch growth or allow access) before marking a tree for removal.
- ◆ *Cable corridor placement* and other logistical aspects of the proposed activity and their potential to affect potential habitat trees should be considered. This necessitates involvement of the Area Biologist through administration of the sale.

G1.1.14 Minimizing disruption of reproductive activities

Disturbance of nesting birds should be avoided by imposing seasonal operating restrictions consistent with policy 1.1.3.16 (also see 1.1.G1.5.2). Since operations will be taking place in close proximity to potential nesting trees, consider applying more conservative restrictions until September 15, based on site-specific assessment and surveys of murrelet activity.

G1.5.2 Minimizing Disturbance in Marbled Murrelet Management Areas

The policy standards in 1.1.3.16 describe measures to be taken to minimize disruption of reproductive activities for marbled murrelet occupied sites. These standards apply to activities taking place within the boundaries of a MMMA, as well as activities taking place outside of a MMMA, but with the potential to disturb activities of murrelets because they are within the critical distance listed in the standards. The season within which activities are restricted is April 1 through September 15. However, some activities that pose a lower risk to nesting murrelets may be allowed between August 6 and September 15 following a consultation with the Area Biologist. The Area Biologist will consider the proximity of the activity to potential murrelet nesting habitat, and whether or not a non-habitat or topographic buffer exists between the activity and the habitat. Fewer murrelets are likely to be nesting this late in the season, so the chances of disturbing nesting murrelets are lower during this time period.

Restriction distances apply to the likely nesting habitat within the MMMA, rather than to the boundary of the MMMA, since many MMMA's will include non-habitat buffers. In situations where the MMMA consists only of likely nesting habitat with no buffer (such as when MMMA's border lands not managed by ODF), then the boundary of the MMMA also represents the boundary of the likely nesting habitat.

When the district is under a fire emergency, these management restrictions can be waived, but the district is encouraged to consider the goals of these conservation areas during fire-related decision-making.

Consultation with the Area Biologist is encouraged when making decisions about the application of these standards and guidelines. For example, the use of explosives for forest management activities is highly variable, and the distances listed per policy 1.1.3.16.5 may be overly protective in many

situations. The Area Biologist can evaluate these situations and make site specific recommendations.

G1.1.15 Recreational Activities

There are three uses of concern related to recreational activities on State Forest lands:

- Motorized trail riding
- Dispersed campsites and trailheads, which attract corvids due to waste and trash
- Target shooting

None of the above activities modify habitat important to marbled murrelets. However, motorized trails and target shooting do pose a large noise impact for short time periods. Dispersed campsites and trailheads are a risk to murrelets in that these sites may attract corvids known to prey on murrelets. Review of these recreational facilities should occur as part of the end-of-the-year reviews of survey data and new designations of MMMA's. The following guidance should be considered to decrease the potential for disturbance from recreational users, and to avoid direct take of marbled murrelets and minimize any potential take incidental to management.

Motorized Trail Riding

Trails within the MMMA Boundaries:

- ◆ Inventory where trails exist within designated MMMA.
- ◆ Consider closing established trails in a MMMA during nesting season. This decision will be made in review with the Area Biologist and considering topographic features and level of use.
- ◆ Consider permanent closure of trails located in a MMMA. This decision will be made in review with the Area Biologist and considering topographic features and level of use.

Proposed New Trails

- ◆ Avoid building new motorized trail within a ¼ mile of a MMMA.

Dispersed Campsites

- ◆ Inventory dispersed campsites within MMMA boundaries.
- ◆ Consider regular monitoring and cleanup during the nesting season for established dispersed camping sites, as well as the installation and regular maintenance of signs discussing murrelet concerns.
- ◆ Consider closing dispersed sites depending on remoteness (for waste management) and use level of the site.
- ◆ Consider other options for limiting access to MMMA's and discouraging the establishment of new dispersed campsites, such as road closures.
- ◆ Avoid establishing new dispersed campsites or improving established sites that are located within MMMA boundaries.

Trailheads

- ◆ Inventory trailheads within MMMA boundaries.

- ◆ Consider installing self-closing trash receptacles and signs discussing murrelet concerns at established trailheads.
- ◆ Avoid new trailhead construction within MMMA boundaries if practical.

Target Shooting

- ◆ Inventory target shooting areas within MMMA boundaries.
- ◆ Consider closing established target shooting areas within MMMA boundaries or ¼ mile buffer during nesting season.
- ◆ Avoid establishing new target shooting areas within MMMA boundaries .
- ◆ Consider options for limiting access to target shooting areas to limit users access to MMMA's, such as road closures.

G1.1.16 Explosives

The Area Biologist may be consulted regarding the use of explosives per 1.1.3.16.5. The Area Biologist may consider the following when determining recommendations for blasting activities:

- ◆ Site-specific topographic features (ridgelines, etc).
- ◆ Size of blasts (small amount of explosive versus large, especially in relation to a occupied site location and frequency of activity)
- ◆ Number of blasts (one blast for rock pit development versus several charges for road building).
- ◆ Number of days needed for blasting (single day event versus multiple day events).
- ◆ Time of day or year (for example, mid-day is better than near sunrise or sunset; late in the season is better than earlier)
- ◆ Surveys – survey work may be appropriate in some site-specific situations, to establish whether a occupied site is within the vicinity. For example, frequent surveys may establish a comfort level that an area is no longer being used for the season.

1.1.G1.6 Guidance for Re-evaluating a Marbled Murrelet Management Area

See operational policy statements 3.17, procedure 1.1.P6.0, and form 1.1.G1.F9.

The PSG Protocol states:

The detection of occupied behaviors in forests implies that the area serves as a breeding location for murrelets. We have no data from which we can recommend how long after surveys are completed that the results of those surveys remain valid. Murrelet surveys reflect the breeding status of sites for the time period during which surveys were conducted. As a breeding area, murrelets may nest there every year, in alternate years, or once in several years (Manley 1999). The extent of use, re-use, or abandonment of nest areas, or establishment of new areas, is unknown... Although it is possible for murrelet presence/probable absence in forest stands to change through time, we recommend that occupied stands should be treated as occupied indefinitely.

Currently, there are insufficient data on long-term activity patterns at inland sites from which to derive a survey strategy that can differentiate between patterns of annual variation in site status and actual vacancy (i.e. the complete discontinuance of use of a site by murrelets). There are also no data concerning recolonization of sites that may have been vacated. It is unlikely that research will provide meaningful insight into these issues in the near future (if ever), given the logistical difficulties in working with individual members of the species. Therefore, any policy or procedure for declaring occupied sites vacant will be based on professional judgement as to how many years of survey with no detections are adequate to make such a determination. The State Forests Program has adopted a standard that five consecutive years of protocol surveys are required prior to evaluation of data to determine whether a site is still being used by marbled murrelets or should be re-classified as historic. The following documents some information relevant to this question from the statistical analysis of the combined Washington, Oregon and California murrelet survey data from 1991 through 1998. During the statistical analysis of the combined Washington, Oregon and California murrelet survey data from 1991 through 1998, an attempt was made to quantify annual variation. Each pair of years during this time period was looked at, and occupied sites surveyed during those years were assessed for status changes (i.e. from occupied to presence or occupied to no detections and vice versa). The proportion of occupied sites that changed status in any given two-year window ranged from 18 – 65%. While the highest proportion of site changes (i.e. 65%) occurred during 1991-1992 (when sample sizes were lower and methods more variable), a high frequency of status changes was also discerned in the mid to late 1990's (when survey efforts were more standardized and sample sizes were larger). Since the number of survey visits suggested by protocol had changed from 1991 – 1998, the probability of not detecting occupancy where it actually existed was taken into account. The weighted average for status changes at occupied sites was 39% for all pairs of years. As a result of this analysis, it was determined that at least two years of survey were necessary to assess the actual status of a site, in an attempt to account for the true condition of the site over multiple years.

It became apparent during this analysis that some sites had even longer term patterns of variation in murrelet occupancy among years. For instance, some sites that had been surveyed for three years may have been occupied in year one, but then not in the following two years. A Markov-Chain analysis (a type of randomization test) was conducted in an attempt to discern patterns beyond the two-year window (Baldwin, J., 2002). The results of this analysis suggested that more complex patterns of variation might affect a large number of sites. However, an inadequate number of sites actually had more than two years of survey and could be investigated further to determine how many, if any, additional years of survey beyond two would be appropriate. Also, while there are many factors that potentially affect such variation (e.g. ocean conditions, offshore population of murrelets in a given area), there were no data available to help determine if particular types of sites (e.g. marginal habitat) were subject to the patterns of variation spanning more than two years. As a result, the statistical analysis review committee decided that a recommendation in the protocol for more than two years of survey could not be supported at this time (Prenzlow Escene, D., 2002).

When attempting to determine if known occupied sites are vacant, however, it is prudent to consider potential annual variation in the true site status, and err on the side of caution. This may be especially true where offshore surveys result in low murrelet population counts and where there are occupied sites with limited habitat that may support few nesting birds. In these situations, the presence of fewer murrelets may result in more pronounced variation in site status over several years of survey. As an example, where a site may have limited habitat, non-nesting by a single pair of birds for more than one year may eliminate the opportunity to observe murrelets during surveys, whereas sites with abundant habitat that supports many nesting pairs is less likely to be affected by multiple years of non-nesting by specific pairs. However, even such “high quality” sites may

experience consecutive years of vacancy if ocean conditions are poor and murrelets either do not nest, or shift their breeding activities to alternate sites.

G1.1.17 Discussing Future Management Options in Inactive MMAs

When a occupied site designated as a Marbled Murrelet Management Area has been reclassified historic following five consecutive years of survey, the Unit Forester should discuss future management options for the area in question with the Area Biologist prior to proposing management activities. These discussions should be conducted in the context of FMP Landscape Design and T&E Species of Concern strategies during the AOP planning process. Within this FMP context, some management options to discuss would include whether the area in question has the potential to provide habitat suitable for marbled murrelets in the future. The Unit Forester and Area Biologist should discuss the feasibility of prescriptions that include retention of platform trees, development of trees with large limbs or hemlock with mistletoe platforms; provision of access to suitable platforms, and cover on suitable platform limbs. Surveys will be required prior to future management activities within these areas once the five year validity period expires (see 1.1.3.7).

1.1.G1.7 Guidance for Communicating with ODFW and USFWS

See operational policy statement 1.1.3.18.

The State Forests Program intends to maintain ongoing and open communication with our agency partners, the Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Service. During the collaborative decision-making processes employed by the wildlife biologists with each District, situations may be identified where communication with these partners could be warranted. The following are examples, although not inclusive of situations that may lead to a need for communication:

- When occupied behavior is observed inside the boundaries of a sold timber sale the Staff Biologist may wish to discuss the situation with the ODFW and USFWS.
- When observed sub-canopy behavior did not warrant designation of an occupied site (see 1.1.3.9), the Staff Biologist may wish to discuss the situation with the ODFW and USFWS.
- When observations of murrelet activity are reported outside of State Forest Program's protocol surveys (see 1.1.3.11), the Staff Biologist may choose to let the ODFW and USFWS know how the information was addressed.