Dear Forest Managers and Surveyors for Marbled Murrelets,

On behalf of the Pacific Seabird Group's Marbled Murrelet Technical Committee, we are pleased to announce the availability of the revised inland survey protocol for Marbled Murrelets, titled *A Revised Protocol for Surveying Marbled Murrelets in Forests.* This is the Pacific Seabird Group's Technical Publication #6, and can be found at https://pacificseabirdgroup.org/psg-publications/technical-publications/. This document is based on the most recent science and new statistical analysis, and is intended to supersede the 2003 inland survey protocol. While we recommend that managers begin using the revised protocol as soon as possible, we do not recommend splitting a survey effort between approaches (i.e. doing the first year of surveys using the 2003 approach and the second year using the 2024 approach). Therefore, recognizing that some areas have already completed the first year of surveys in 2023, or have already planned and budgeted for 2024 surveys using the 2003 approach, we recognize that starting to use the revised protocol in 2024 may not be feasible. However, we recommend users begin new survey efforts using the revised protocol by 2025 and to fully transition to the revised protocol for all surveys no later than spring 2026.

A protocol intended for many different users and for a variety of forestland management and research-related purposes cannot cover all possible scenarios that may be encountered in managed forested landscapes. This protocol should be used in consultation with State, Provincial, or Federal regulatory agencies, as appropriate.

To assist users in transitioning from the 2003 to the 2024 protocol, the Marbled Murrelet Inland Survey Protocol Subcommittee has identified several areas of the protocol that have undergone substantial updates and revisions. The more substantive changes include the following, while the crosswalk table at the end of this letter provides a more detailed and expansive list:

1. Changes to the required sampling effort (generally requiring more survey visits), as well as including a new sampling design option that treats three or more survey visits with presence detections across a survey area as occupancy and may reduce sampling effort;

2. Change in terminology from survey sites to survey strata (survey stratum singular), as well as to how the survey strata are applied within a survey area;

3. Updates to distances associated with Survey Station effective survey radius and stand contiguity;

4. Interpreting survey results, including treating many circling behaviors as occupied behaviors; and

5. An updated datasheet.

On behalf of the Marbled Murrelet Technical Committee, we thank all members of the Marbled Murrelet Inland Survey Protocol Subcommittee for their expertise, hard work and perseverance in completing this revised protocol. The revised protocol is based on the best available science and scientific expertise, and will provide useful guidance for conservation of the Marbled Murrelet.

Sincerely,

Lindsay Adrean and William McIver

(co-Coordinators, Marbled Murrelet Technical Committee)

"Crosswalk table" describing differences and similarities between the 2003 and 2024 inland survey protocols for the Marbled Murrelet.

Area of Protocol	2003 Inland Survey Protocol	2024 Inland Survey Protocol
Habitat		
Platform	At minimum, "a relatively flat surface at least 10 cm (4 in) in diameter and 10 m (33 ft) high in the live crown of a coniferous tree."	"Relatively flat surface on a limb or deformity (≥10 cm (4 inches) in diameter and ≥10 m (33 ft) above the ground in the live crown of a coniferous tree)."
Habitat to survey	(1) mature (with or without an old-growth component) and old-growth coniferous forests; and (2) younger coniferous forests that have platforms. Generally limited to habitat within the project footprint or continuous habitat within 0.25 mile of the footprint.	A forest stand with at least one coniferous platform tree, or as consulted upon with your regulatory agency. Includes all habitat within the project footprint and contiguous habitat within 0.25 mile of the footprint.
Continuous potential habitat (as defined in 2003 protocol) or **Contiguous habitat** (as defined in the new protocol)	Coniferous forest that contains no gaps in suitable forest cover wider than 100 m (328 ft).	Areas of mapped habitat that are within the project footprint or ≤ 200 m (656 ft) from the project footprint or from habitat contiguous with the footprint out to 0.25 miles. The 200 m (656 ft) gap is measured as the distance between platform trees.
Sampling effort		

Consecutive years of survey effort	2	2
Survey area	Entire area under observation; large areas divided into "survey sites." The minimum area surveyed should be the potential habitat that falls within the proposed project area and within 0.25 mile (402 m) of the project area boundary that is contiguous with the project area.	Entire area under observation; large survey areas are divided into **survey strata**. The survey area is the unit at which surveys are conducted and occupancy classification is determined. As with 2003 protocol, habitat more than 0.25 mile from the project footprint does not need to be surveyed.
Survey site (2003 protocol) or Survey stratum (2023 protocol)	A **survey site** is the unit by which survey visits are designed and carried out, and the unit to which the requisite number of visits applies. Recommends limiting the size of the survey site to 61 ha (150 acres). When the survey area is small (< ~61 ha), the site encompasses the entire survey area.	Similar approach but slightly different terminology. Strata are still a maximum of 150 acres (+ 10%), but there are no more than three strata allowed in a survey area.
Survey approach options	Only one survey approach.	Two options: <u>Occupied Only Approach</u>: survey approach in which a detection of an occupied behavior (e.g., subcanopy flights, circling, and landings) at any station within the survey area leads to an Occupied classification. This is similar to the 2003 protocol. Requires more survey visits than the **Presence Approach**. <u>Presence Approach</u>: survey approach in which a detection of occupied behavior or three survey visits with one or more presence detections in a survey area over the 2-year survey period results in an Occupied

		classification. Requires fewer survey visits than the **Occupied Only Approach**.
Survey effort	5 to 9 survey visits per year per survey site; 9 visits are required if there are any presence detections during the first 5 visits.	Varies from 8-20 survey visits per stratum per year. Number of visits depends on survey approach and size of survey area (number of strata), per protocol Table 2-2. Note that larger survey areas (those with more than 1 stratum) require more survey visits per stratum than do smaller survey areas.
Seasonal timing of surveys	April 15th – August 5th for California; May 1 - August 5 in Oregon & Washington Surveys should begin within the first two to three weeks of the survey season, and be scheduled at regular intervals throughout the season. Recommends at least 2 of the 5 minimum visits (using a 5-visit stopping rule) occur after 30 June but before July 18. When 9 visits are needed, survey visits should be spaced as evenly as possible throughout the breeding season, with at least 4 of the 9 visits for occupancy after June 30, and at least half of those within the first 3 weeks of July.	April 15th – August 5th For survey distribution by time period for California, see protocol Table 2-3) For survey distribution by time period for Oregon & Washington, see protocol Table 2-4).
Daily timing of surveys	The survey period in California, Oregon, Washington, and British Columbia is defined as the two-hour period from 45 minutes before to 75 minutes after official sunrise or for 15 minutes after the last	Same as 2003 protocol.

	detection, whichever is longer.	
Survey station placement	Stations placed in locations to optimize viewing areas for murrelets (near large trees and in gaps), while maintaining station spacing of 400m or less throughout habitat.	Stations placed in locations to optimize viewing areas for murrelets (near large trees and in gaps), albeit within 50 meters of survey station locations selected randomly from a pool of potential station locations spaced 200 m or less apart throughout habitat. All potential stations are surveyed if the number of required surveys per stratum meets or exceeds the number of stations.
Assumed station effective area	200 meters	100 meters
Classification of sites and survey area	Three possible classification outcomes, applied explicitly at the Site scale, and by extension at survey area scale: (1) Occupied; (2) Presence; and (3) Probable Absence.	Two possible classification outcomes, applied explicitly at the survey area scale: (1) Occupied; (2) Not Occupied.
Presence classification	Site of potential habitat where there has been at least one murrelet detection.	Not a classification outcome. However, all presence detections should be recorded in all spreadsheets and databases. This includes state-managed databases where the survey area Detection Type is recorded as ‘presence’ if there was at least one presence detection in the survey area.

Occupied classification	Where murrelets have been observed exhibiting "occupied behaviors", or where evidence of nesting (including evidence of an active or past nest, or finding eggs, eggshell fragments or a downy chick on forest floor).	Same as 2003 protocol, plus a survey area is classified as Occupied based on presence detections during three or more survey visits over the 2-year survey period, if using the "Presence Approach" option.
Not occupied classification	Not a classification outcome.	Outcome when protocol-level survey has been conducted and the results do not result in an "Occupied" classification.
Occupied behaviors	Birds flying below, through, into, or out of the forest canopy within or adjacent to a site of potential habitat; birds perching, landing, or attempting to land on branches; birds calling from a stationary location within the site.	All the behaviors described in the 2003 protocol, as well as "circling behavior"; circling behavior can include complete circles, partial circles, and any arc, curve, or turns that result in a change of direction of 45 degrees or more from the initially observed flight path.
Years that "unoccupied" determination applies	5 years	5 years