RADAR AND AUDIO-VISUAL SURVEYS FOR MARBLED MURRELETS IN THE CEDAR RIVER MUNICIPAL WATERSHED, WASHINGTON, 2005–2007

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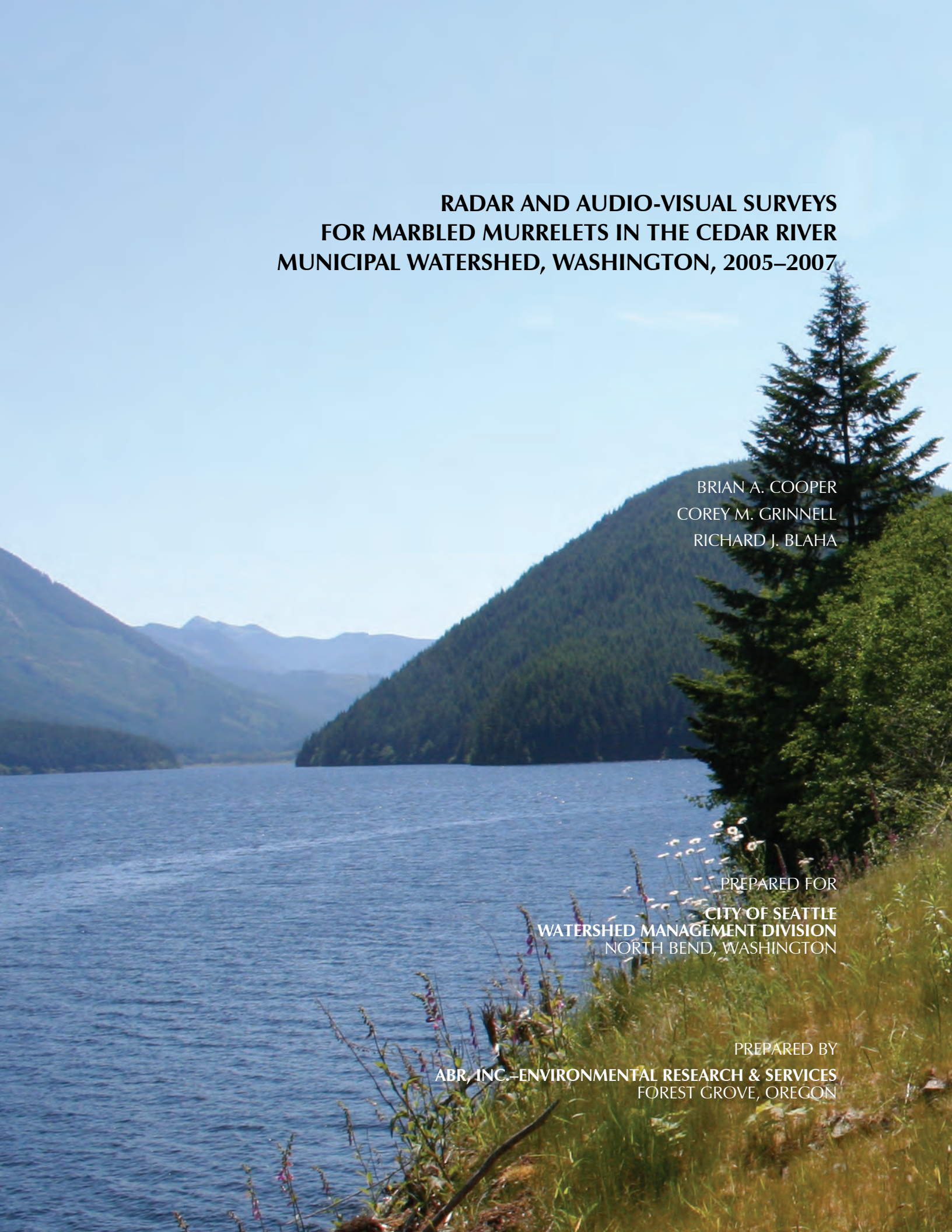

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CITY OF SEATTLE
WATERSHED MANAGEMENT DIVISION
NORTH BEND, WASHINGTON

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RADAR AND AUDIO-VISUAL SURVEYS FOR MARBLED MURRELETS IN THE CEDAR RIVER MUNICIPAL WATERSHED, WASHINGTON, 2005–2007

FINAL REPORT

Prepared for
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Watershed Management Division
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EXECUTIVE SUMMARY

- This report summarizes the results from the final year of a three-year effort to use a combination of ornithological radar and standard audio-visual (AV) methods to collect baseline information on distribution and abundance of Marbled Murrelets (*Brachyramphus marmoratus*) in the Cedar River Municipal Watershed (CRMW), Washington, 2005–2007.
- The purpose of the 2007 study was to use radar and audio-visual techniques to monitor trends in the distribution and abundance of murrelets in the CRMW. Specifically, the objectives of the 2007 study were: (1) to collect baseline radar information on numbers of Marbled Murrelets using the watershed in 2007 as the third year of a long-term monitoring effort; (2) to conduct audio-visual surveys for murrelets in the sub-basins identified by radar in 2006 as having murrelet presence, or in sites identified as having the best potential murrelet nesting habitat in the CRMW; and (3) to obtain a better understanding of interannual variation in radar counts of murrelets in the CRMW.
- We conducted a total of 23 mornings of radar observations during summer 2007. We used radar to sample four long-term sites used for monitoring purposes. Radar sampling was conducted for five mornings at all sites (not including mornings when sampling was cancelled by rain) during late June to July. Radar sampling occurred during the morning activity period for Marbled Murrelets, from 105 min before sunrise to 75 min after sunrise.
- We recorded a total of 25 pre-sunrise murrelet targets during 20 mornings of radar observation in the CRMW during summer 2007. An additional three mornings of radar sampling were cancelled by inclement weather. Of the 25 radar targets we observed, eight (32%) were flying in a landward direction, 15 (60%) were flying in a seaward direction, and 2 (8%) were flying in "other" directions. We had no audio-visual observations of Marbled Murrelets during radar sampling.
- Similar to 2005 and 2006, mean daily counts of landward radar targets generally were quite low in 2007. Mean landward counts ranged between 0 and 1 target per morning. The highest landward counts occurred at the Chester Morse site.
- Mean landward radar counts did not differ significantly between 2005, 2006, and 2007.
- We observed relatively high among-day variation in landward counts. Coefficients of Variation (CV's) ranged from 130% at Chester Morse to 173% at the three Powerline sites.
- We used Monte Carlo simulations to determine our power to detect increases in radar counts of murrelets as nesting habitat develops in the Cedar River drainage. This prospective power analysis indicated that we could expect to have adequate power (i.e., power > 0.8) to detect between a 2–3% annual increase in the murrelet counts at the Cedar River study sites in future years (i.e., in ~ 25–50 years).
- Mean landward flight directions generally were centered along the main axis of the valley near each radar site.
- During summer 2007, we conducted 54 mornings of standard audio-visual surveys (plus one tandem visit) at sites with the best murrelet habitat in CRMW, and/or in areas of suitable habitat where radar observations in 2006 suggested presence of marbled murrelets. We detected no murrelets at the nine sites (155.1A, Chester North, Lindsay Creek North, Lost Creek, Lower Rex East (Findley), Rack Creek, South Fork North, South Fork Northeast, and Taylor Ridge North) where we conducted five audio-visual surveys from late June through the end of July. Likewise, we did not detect any murrelets during our single late-July visit to the South Fork Taylor Creek site.
- In summary, during 2005–2007 we established four long-term radar monitoring stations in the CRMW for marbled murrelets. Baseline data were collected and power analyses indicated that we could expect to detect between a 2–3% annual increase in radar counts when surveys are conducted using similar methods in ~25

and 50 years. We also used a combination of radar and audio-visual techniques combined with murrelet nest habitat surveys to determine current nesting locations of murrelets in the CRMW and verified murrelet use at two sites (i.e., Rex River and confluence of North Fork and South Fork Cedar River). Additional radar sightings in areas that had some nesting habitat but were not surveyed for a full two years suggested that low numbers of murrelets also were possible at a few other areas within the CRMW (i.e., at West Fork, 155.1A, South Fork Northeast, and South Fork Taylor) besides the two documented sites.

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ACKNOWLEDGMENTS

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INTRODUCTION

The Marbled Murrelet (*Brachyramphus marmoratus*) is a seabird that nests in large trees in old-growth coastal forests throughout most of its range in North America (Nelson 1997). Marbled Murrelets fly at high speeds, visit their nests primarily during periods of low ambient light, and nest up to ~80 km inland. Because of their secretive behaviors, their semicolonial nesting behavior, and the difficulty of locating their nests in large trees, only limited information is available on their nesting behavior, habitat associations, population size in specific areas, and demography. The Washington, Oregon, and California population of the Marbled Murrelet was federally listed as a Threatened Species in 1992 because of excessive loss and fragmentation of nesting habitat and because of mortality associated with oil spills and gill-net fishing (USFWS 1992, 1997). The species also is classified as endangered at the state level in California and as threatened at the state level in Washington and Oregon and is listed as threatened in Canada. Comparison of historical and current data suggest that Marbled Murrelets have disappeared or become rare over much of their range south of Alaska, but current population trends of the species in the Pacific Northwest are unknown (Nelson 1997).

The current ground-based Inland Forest Survey Protocol (IFSP) for Marbled Murrelets depends on the use of audio-visual cues to detect birds in flight (Evans Mack et al. 2003). Collecting information on murrelets this way is difficult because of the low light conditions during their dawn and dusk peaks in inland activity and their small size, cryptic coloration, rapid flight speed, and habitat preference for old-growth, closed canopy forests. Further, because 85% of the murrelet detections are auditory (Paton et al. 1990), it is difficult to determine with accuracy the number of birds that actually are flying over a particular survey area. In fact, audio-visual surveys (Evans Mack et al. 2003) were not designed to provide an index of abundance and, even if they were used, the high variation in audio-visual counts would require a massive survey effort to detect trends (Jodice et al. 2001, Bigger et al. 2006).

Several studies have shown that radar is an excellent tool for observing Marbled Murrelets (Hamer et al. 1995; Cooper et al. 2001, 2006a; Cooper and Blaha 2002; Cooper and Hamer 2003; Burger 1997, 2001; Raphael et al. 2002; Burger et al. 2004). The main advantages of using radar for inventorying murrelets are that it works under all light conditions, does not have the auditory bias of audio-visual surveys, and can sample a large area. Although radar cannot be used at all stands because certain terrain types preclude its use, it can be used in appropriate locations to determine quickly and accurately whether murrelets are present in a forest stand. Radar is particularly useful for detecting birds at low-use sites, where murrelets often are missed completely by audio-visual observers (Cooper and Blaha 2002). Radar data also can be used to focus ground observers' efforts toward "hot-spots" of murrelet activity. Further, radar can improve survey efficiency because it samples a much larger area (up to a 1,500-m radius) than audio-visual observers do (up to a 200-m radius).

In addition to determining presence of murrelets in an area, radar can provide a good index of abundance for Marbled Murrelets on several scales, including a river-drainage-sized scale that can be used for monitoring (Hamer et al. 1995; Burger 1997, 2001; Cooper et al. 2001, 2005, 2006a; Raphael et al. 2002; Cooper and Blaha 2002; Evans Mack et al. 2003). Power analyses have revealed that radar-based monitoring of murrelets can produce statistically-sensitive results in a timely, cost-effective fashion because of the low among-day variation in counts (Cooper et al. 2001, 2006a; Burger et al. 2004; Bigger et al. 2006).

The Cedar River Watershed Habitat Conservation Plan commits Seattle Public Utilities to managing the Cedar River Municipal Watershed (CRMW) as an ecological reserve with active forest restoration. Monitoring Marbled Murrelet activity in the CRMW is designated by the Habitat Conservation Plan: over the 50-year course of the HCP, local population indices of murrelets are expected to provide a barometer to gauge how well the old-growth forests are being restored. In this program, the activity of murrelets will be assessed within both old-growth and second-growth forests of the CRMW during three time periods that

encompass the early (i.e., 2005–2007), middle, and late stages of the HCP. This report summarizes the results from the third year of the 2005–2007 effort to use radar and audio-visual methods to collect initial baseline information on murrelet distribution and abundance in the CRMW. Results of the first and second years of the study are summarized in Cooper et al. (2006b and 2007).

OBJECTIVES

The purpose of this study was to use radar and audio-visual techniques to monitor trends in the distribution and abundance of murrelets in the CRMW. Specifically, the objectives of the 2007 study were: (1) to collect baseline radar information on numbers of Marbled Murrelets using the watershed in 2007 as the third year of a long-term monitoring effort; (2) to conduct audio-visual surveys for murrelets in the sub-basins identified by radar in 2006 as having murrelet presence, or in sites identified as having the best potential murrelet nesting habitat in the CRMW; and (3) to obtain a better understanding of interannual variation in radar counts of murrelets in the CRMW.

STUDY AREA

The entire 90,546-acre Cedar River Municipal Watershed (CRMW) lies within 45 miles of Puget Sound and encompasses roughly 14,000 acres of old-growth forest and 71,500 acres of second-growth forest (Figure 1). The elevation of the area ranges from ~400 to ~1,500 m above sea level. Currently managed under the 50-year Cedar River Watershed Habitat Conservation Plan, old-growth forest in the watershed is protected as a reserve and the second-growth forests are subject to limited habitat restoration with the objective of shortening the time to old-growth forest conditions. Marbled Murrelets were detected at one location in the CRMW in the mid-1990s (W. P. Ritchie, WDFW, pers. comm.); however, there has been no other systematic assessment of use of this area by murrelets until the current study. During summer 2007, we conducted radar-based sampling for Marbled Murrelets at four sites in the study area that provided good radar coverage over areas of interest (Figure 1, Table 1). All radar sites were photo documented to help future observers compare suitability of the sites in the future with current suitability, in terms of the amount of screening of the radar view by nearby vegetation (Appendix 1). We also conducted audio-visual observations for murrelets at 10 sites within the CRMW (Figure 2, Table 2).

METHODS

DATA COLLECTION

We conducted a total of 23 mornings of radar observation and 54 mornings of audio-visual observations (plus one tandem visit) during summer 2007 (Tables 3 and 4). Radar sampling was conducted at the four long-term monitoring sites (i.e., the Powerline North, Powerline Central, Powerline South, and Chester Morse) on five mornings at each site from late June to July 2007 (Table 3). Radar sampling occurred during the morning activity period for Marbled Murrelets, from 105 min before sunrise to 75 min after sunrise. This period encompasses the known peak of daily murrelet activity (Burger 1997, Cooper et al. 2001, Cooper and Blaha 2002, Cooper and Hamer 2003).

During sampling, a single observer set up the radar and video recorder, and then attempted to obtain an audio-visual confirmation of each radar target to confirm the species identity of Marbled Murrelets and other species likely to be confused with murrelets on radar. Audio-visual observations were transmitted by voice directly to the videotape of the radar screen. For each radar target, we recorded date, time, flight direction (to the nearest 1°), transect quadrant, minimal distance to target, groundspeed (mi/h), flight behavior (straight-line, erratic, circling), overlap category (recorded only on radar, recorded only by audio-visual observer, recorded by both radar and audio-visual observer), species (if known), number of birds represented by that radar echo (if known), flight altitude (if known), and audio-visual detection category (not detected by audio-visual observer, heard only, seen only, both seen and heard). We also plotted the flight path of each target on a transparency overlay of the radar screen. We recorded the following weather information at the beginning of each session or when conditions changed during a

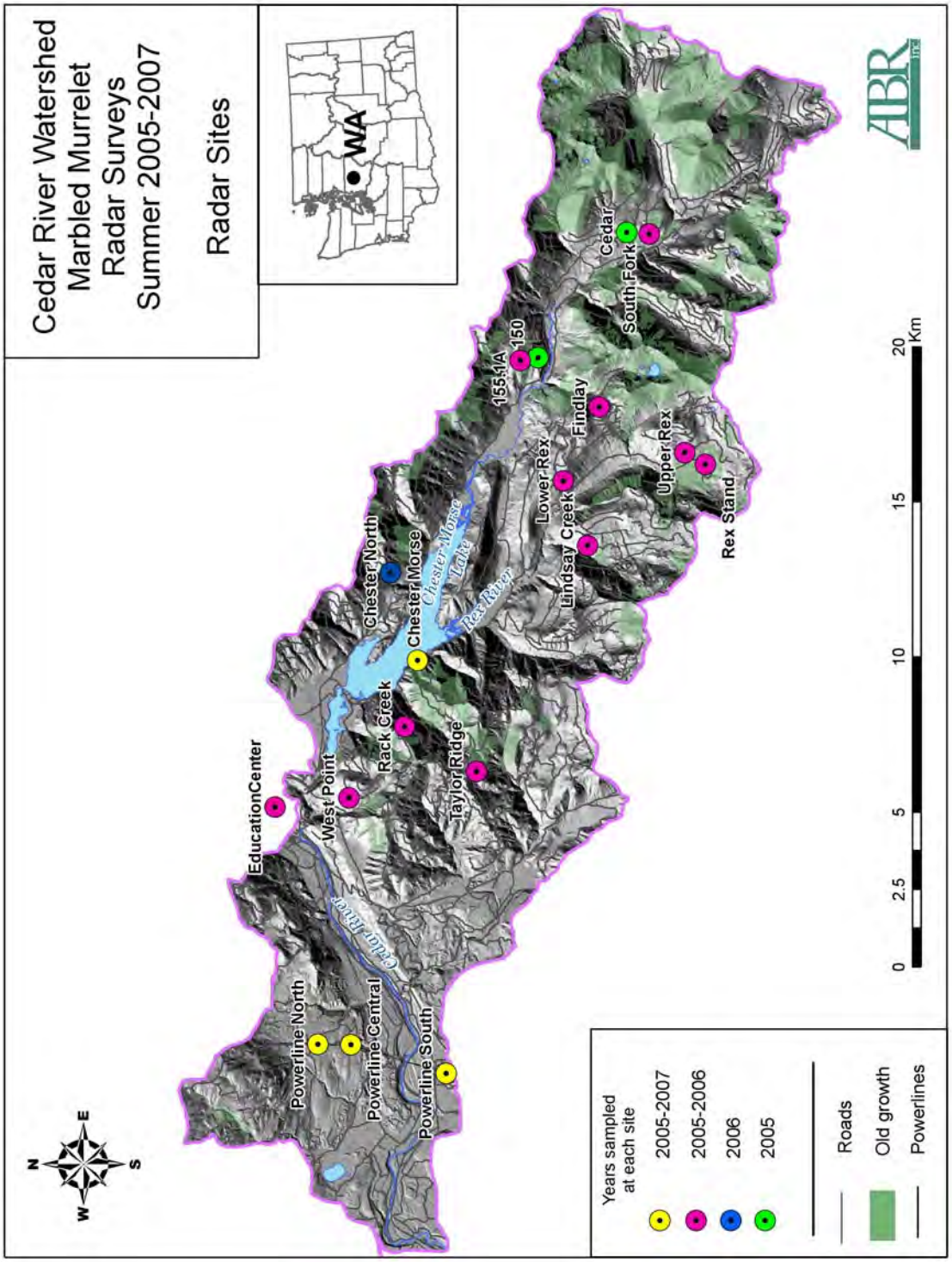

Figure 1. Map showing the locations of radar sampling sites in the Cedar River Municipal Watershed, Washington, during summer 2005, 2006, and 2007.

Table 1. Location of summer 2005, 2006, and 2007 radar sampling sites in the Cedar River Municipal Watershed, Washington.

Site type/site name	UTM coordinates[1]		Elevation	Comments
LONG-TERM SITES				
Powerline North	584934 E	5251791 N	408 m	1.07 km north of Powerline Central.
Powerline Central	584945 E	5250723 N	333 m	At end of road, 3.15 km from Powerline South.
Powerline South	584115 E	5247628 N	280 m	On north side of Line 1, Mile 22, Tower 1; northern side of third set of poles south of road.
Chester Morse	597393 E	5248917 N	502 m	In largest pullout on lake side of road.
155.1A[4]	607146 E	5245901 N	872 m	Park in Spur Road 155.1a.
South Fork[4]	611339 E	5241839 N	767 m	At landing at end of Road 521.
SHORT-TERM SITES				
Education Center[4]	592538 E	5253385 N	275 m	In middle of northern lot at Education Center.
West Point[4]	592897 E	5251013 N	799 m	On large landing at end of Road 820.
Taylor Ridge[4]	593869 E	5246922 N	1065 m	At end of Spur Road #815.5.
Rack Creek[4]	595244 E	5249277 N	961 m	Along Road 811, ~100 m before fork.
Lindsay[4]	601245 E	5243557 N	817 m	100 m from end of Spur Road 205, adjacent to large log pile.
Chester North[3]	600135 E	5249969 N	813 m	Along roadside, 400 m from end of road 110.8.
Upper Rex[4]	604331 E	5240500 N	1,033 m	At end of Spur Road 730.1.
Rex Stand[4]	603962 E	5239832 N	954 m	In opening next to log pile.
Lower Rex[4]	603301 E	5244402 N	888 m	At end of Road 310.
Findley[4]	605714 E	5243307 N	1,076 m	At end of Road 354.
150[2]	607248 E	5245332 N	761 m	Park along road with downhill slant toward the east.
Cedar[2]	611373 E	5242572 N	748 m	Western end of opening with few trees alongside road.

[1]UTM Zone 10; [2]Site only sampled in 2005; [3]Site only sampled in 2006; [4]Site only sampled in 2005 and 2006.

session: wind direction, average wind speed at ground level, estimated cloud cover (%), average ceiling height (in meters) above ground level at the radar sampling site, visibility, precipitation, and air temperature (°C). See Appendix 2 for categories for each target and weather variable.

During summer 2007, we also conducted 54 mornings of standard audio-visual surveys (plus one tandem visit) at sites with the best murrelet habitat in CRMW, and/or in areas of suitable habitat where radar observations in 2006 suggested presence of Marbled Murrelets. All surveys occurred from late June to July (Table 4). Except for the seasonal timing of surveys, the audio-visual survey methods followed standard protocols (Evans Mack et al. 2003). Survey conditions (e.g., ceiling height, wind conditions) met protocol requirements on all but eight surveys, which were later resurveyed (Table 4) so that all sites had a minimum of five survey visits, unless occupancy was determined before then. The exception to this occurred at South Fork Taylor Creek, which was

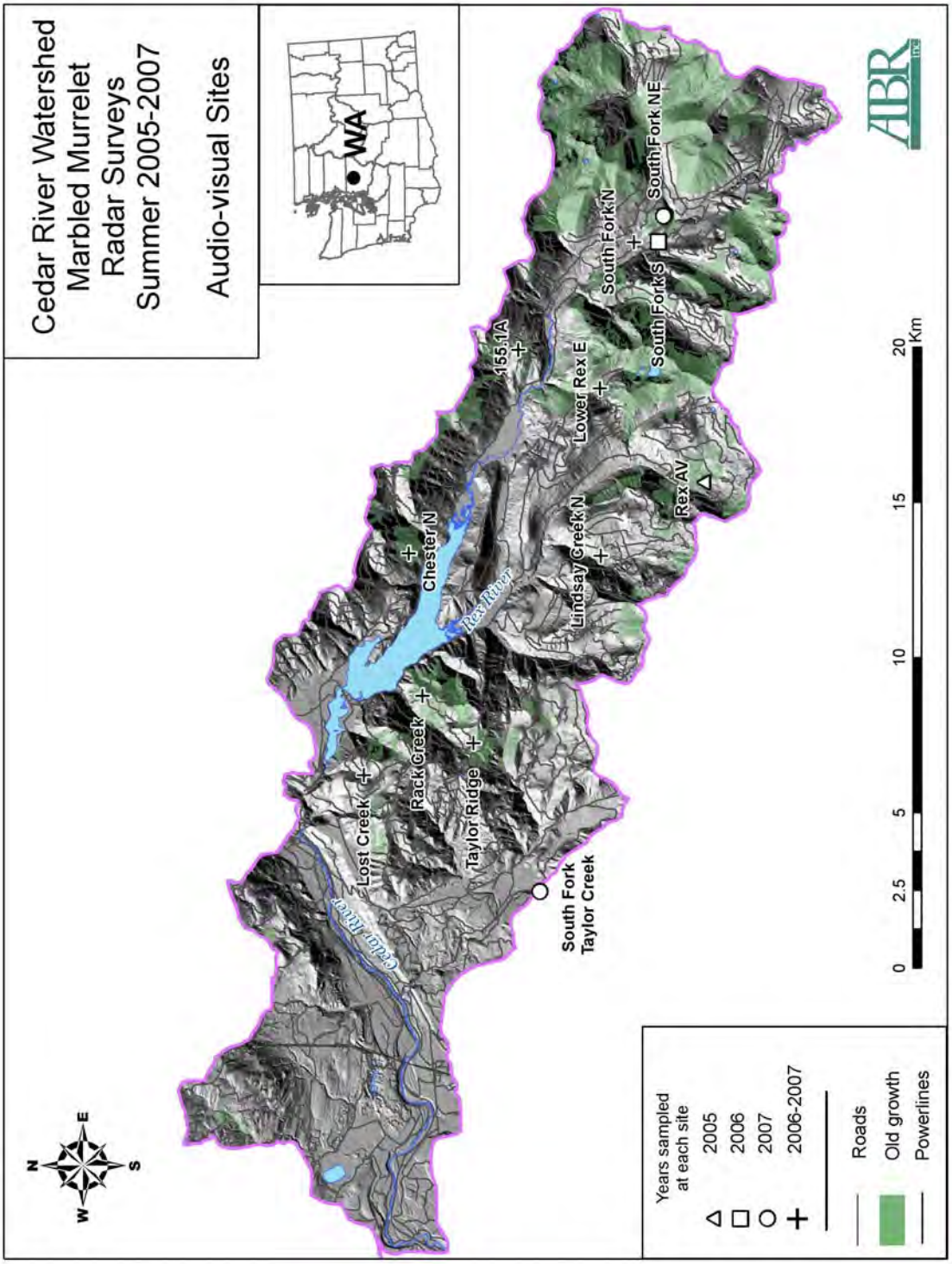

Figure 2. Map showing the locations of audio-visual sampling sites in the Cedar River Municipal Watershed, Washington, during summer 2005, 2006, and 2007.

Table 2. Location of summer 2005, 2006, and 2007 audio-visual sampling sites in the Cedar River Municipal Watershed, Washington.

Site	Station	UTM coordinates[1]		Elevation (m)
155.1A[2]	1	607495 E	5245965 N	894
	2	607568 E	5245843 N	825
Chester North[3]	2	601264 E	5249531 N	977
	3	600811 E	5249252 N	723
Lindsay Creek[3]	1	601172 E	5243187 N	871
	2	601032 E	5243132 N	826
	3	601178 E	5243286 N	849
Lost Creek [3]	1	594882 E	5250301 N	739
Lower Rex E (Findley)[3]	1	606326 E	5243160 N	958
	2	606438 E	5243247 N	832
Rack Creek [3]	1	596219 E	5248719 N	934
	2	596282 E	5248774 N	914
	3	596403 E	5248698 N	887
Rex AV[4]	1	603432 E	5240777 N	871
	2	603645 E	5239650 N	965
	3	603390 E	5239890 N	912
South Fork North[3]	1	611067 E	5242333 N	659
	2	611306 E	5242332 N	724
	3	611251 E	5242146 N	728
South Fork Northeast[2]	1	611924 E	5241408 N	801
South Fork South[5]	1	611158 E	5241522 N	684
South Fork Taylor Creek[2]	1	589807 E	5744497 N	434
Taylor Ridge North[3]	1	594828 E	5247069 N	1053
	3	594696 E	5247009 N	1063

[1]UTM Zone 10; [2]New site that was not sampled in either 2005 or 2006; [3]New site that was not sampled in 2005; [4]Site only sampled in 2005; [5]Site only sampled in 2006.

found to contain suitable Marbled Murrelet habitat towards the end of the survey season and was only sampled once.

RADAR EQUIPMENT AND OPERATION

Our mobile radar laboratories consisted of marine surveillance radars mounted on vans. The radars scanned the entire area around the labs and were used to obtain information on flight paths, movement rates, and ground speeds of murrelets. A similar radar laboratory is described in Gauthreaux (1985a, 1985b) and Cooper et al. (1991). The lab was powered by four 6-V batteries that were linked in series. The surveillance radar (Furuno Model FCR-1510; Furuno Electric Company, Nishinomiya, Japan) is a standard marine radar transmitting at 9,410 MHz (i.e., X-band) through a slotted wave guide (i.e., antenna) 2 m long with a peak power output of 12 kW. The radar was operated at the 1.5-km range with the pulselength set at 0.07 µsec and the forward edge of the antenna elevated by ~15°. Figure 3 shows the approximate murrelet-sampling airspace for the Furuno FR–1510 marine radar at the 1.5-km range setting, as determined by field trials with Rock Pigeons, which are similar in size to Marbled Murrelets.

Table 3. Daily counts of radar targets observed at sites in the Cedar River Municipal Watershed, Washington, during summer 2007, by flight direction. Table counts include only targets recorded before sunrise.

			Number of targets recorded on radar		
Date	Site	Sampling hours	Landward	Seaward	Other
19 June	Chester Morse	0324–0624	0	3	0
20 June	Powerline South	0325–0625	2	0	0
21June	Powerline Central*	0325–0625*	--	--	--
22June	Powerline Central*	0325–0625*	--	--	--
26 June	Powerline Central	0326–0626	0	4	0
27 June	Powerline North	0327–0627	1	0	0
28 June	Chester Morse	0327–0627	0	0	0
09 July	Powerline South	0335–0635	0	1	0
10 July	Powerline Central	0335–0635	0	0	1
11 July	Powerline North	0336–0636	0	0	0
12 July	Chester Morse	0337–0637	5	1	0
13 July	Powerline South	0338–0638	0	0	0
17 July	Powerline Central	0342–0642	0	0	0
18 July	Powerline North*	0343–0643*	--	--	--
19 July	Powerline North	0344–0644	0	0	0
20 July	Chester Morse	0350–0650	0	0	0
24 July	Powerline South	0337–0637	0	3	0
25 July	Powerline Central	0351–0651	0	1	0
26 July	Powerline North	0352–0652	0	2	0
27 July	Chester Morse	0354–0654	0	0	0
28 July	Powerline South	0355–0655	0	0	0
29 July	Powerline Central	0356–0656	0	0	0
30 July	Powerline North	0357–0657	0	0	1

* Sampling session cancelled by rain.

Whenever energy is reflected from the ground, surrounding vegetation, or other objects that surround the radar unit, a ground-clutter echo appears on the display screen. Because ground clutter can obscure bird targets on the radar display screen, we attempted to minimize it by parking the radar laboratory in a location that was surrounded closely by low vegetation or small hillsides. These objects acted as a radar fence that shielded the radar from low-lying objects farther away from the lab and that produced only a small amount of ground clutter in the center of the display screen. For further discussion of radar fences, see Eastwood (1967), Williams et al. (1972), and Skolnik (1980).

Maximal distances of detection of birds by the surveillance radar depends on body size of the birds, flock size, flight profile of the birds, distance between flying birds, atmospheric conditions, and, to some extent, the amount and location of ground clutter. Marbled Murrelets usually are detectable to at least 1.5 km, whereas single, small passerines are detectable to ~1 km (Figure 3; Cooper et al. 1991, 2001; Cooper, unpubl. data).

DATA ANALYSIS

For all analyses, we classified targets as "landward" or "seaward" if they were flying within 60° of the main axis of the valley in an landward (i.e., inbound flights from the ocean) or seaward (i.e., outbound) direction, respectively, and

Table 4. Daily counts of Marbled Murrelets recorded during audio-visual surveys of the Cedar River Municipal Watershed, Washington, during summer 2007.

Site	Station	Date	Survey to protocol?	Number of detections	
				Presence[1]	Occupied[1]
155.1A	2	14 June	No	0	0
	1	22 June	No	0	0
	1	28 June	Yes	0	0
	1	06 July	Yes	0	0
	2	13 July	Yes	0	0
	2	20 July	Yes	0	0
	2	27 July	Yes	0	0
Chester North	3	13 Jun	Yes	0	0
	2	21 Jun	Yes	0	0
	3	08 Jul	Yes	0	0
	2	12 Jul	Yes	0	0
	2	28 Jul	Yes	0	0
Lindsay Creek North	1	12 June	Yes	0	0
	1	15 June	No	0	0
	1	19 June	Yes	0	0
	2	28 June	Yes	0	0
	3	12 July	Yes	0	0
	1	20 July	No	0	0
	1	25 July	Yes	0	0
Lost Creek	1	13 June	Yes	0	0
	1	21 June	Yes	0	0
	1	29 June	Yes	0	0
	1	09 July	Yes	0	0
	1	29 July	Yes	0	0
Lower Rex East (Findley)	1	13 June	Yes	0	0
	1	15 June	No	0	0
	1	20 June	Yes	0	0
	1	30 June	No	0	0
	1	07 July	Yes	0	0
	1	10 July	Yes	0	0
	2 audio	26 July	Yes	0	0
	2 visual	26 July	Yes	0	0

Table 4. Continued.

Site	Station	Date	Survey to protocol?	Number of detections	
				Presence[1]	Occupied[1]
Rack Creek	2	12 June	Yes	0	0
	2	15 June	Yes	0	0
	2	26 June	Yes	0	0
	2	11 July	Yes	0	0
	2	18 July	No	0	0
	2	19 July	Yes	0	0
South Fork North	2	14 June	Yes	0	0
	3	22 June	Yes	0	0
	1	09 July	Yes	0	0
	3	13 July	Yes	0	0
	3	27 July	Yes	0	0
South Fork Northeast	1	20 June	Yes	0	0
	1	29 June	Yes	0	0
	1	10 July	Yes	0	0
	1	17 July	Yes	0	0
	1	25 July	Yes	0	0
South Fork Taylor Creek	1	30 July	Yes	0	0
Taylor Ridge North	3	12 June	Yes	0	0
	3	14 June	Yes	0	0
	3	27 June	Yes	0	0
	3	11 July	Yes	0	0
	3	18 July	No	0	0
	3	19 July	Yes	0	0

[1] Murrelet detections, as defined by the PSG survey protocol (Evans Mack et al. 2003).

classified targets as "other" if they were not flying in a landward or seaward direction. Following Cooper et al. (2001, 2006a), we used radar counts of landward-flying targets as our daily index of murrelet abundance at a site.

Marbled Murrelet targets detected on radar were distinguished from other species by their flight speed, timing, and (sometimes) target signature. We have determined that a >40-mi/h (64-km/h) speed cutoff minimizes the number of non-murrelet species while eliminating a small percentage (~3%) of Marbled Murrelets (Cooper and Blaha 2002, Cooper et al. 2001). Thus, all targets with a flight speed greater than 40 mi/h (64 km/h) were considered to be Marbled Murrelets, unless the target signature was typical of a flock of Band-tailed Pigeons *(Columba fasciata)* or the target was observed after sunrise. Band-tailed Pigeon flocks sometimes exhibit a characteristic signature that is large and composed of multiple targets that repeatedly break apart, and then coalesce. These targets are easily distinguished from a typical Marbled Murrelet target. In addition, we eliminated targets that were observed after sunrise to help eliminate single Band-tailed Pigeons from the data set. We have found that Band-tailed Pigeon activity generally does not start until a few minutes after sunrise (i.e., 105 min after our radar surveys begin). So, we have a higher degree of confidence in the radar identification of

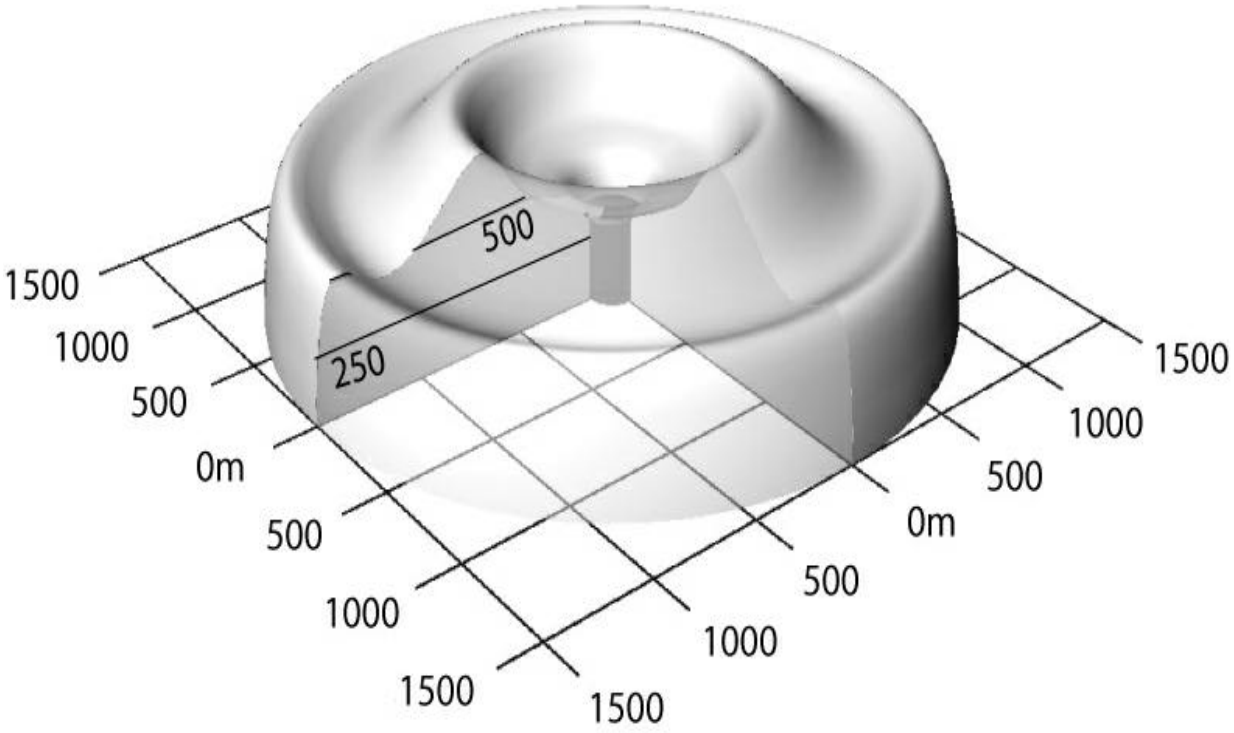

Figure 3. Approximate sampling airspace for the Furuno FR–1510 marine radar at the 1.5-km range setting, as determined by field trials with Rock Pigeons, which are similar in size to Marbled Murrelets. Note that the configuration of the radar beam within 250 m of the origin (i.e., the darkened area) was not determined.

murrelets before sunrise than after sunrise in areas like the CRMW where Band-tailed Pigeons are common. Nearly all murrelets fly into nesting stands well before sunrise (Cooper et al. 2001, Burger 1997). So, it is likely that few landward targets would be missed using this sunrise cutoff time. Further, a precedent for this method has been set by Burger (2001) and Burger et al. (2005), who used sunrise for their cutoff period to count murrelets.

We used a repeated measures Analysis of Variance to compare differences among all three study years (2005–2007) within sites. Following Bigger et al. (2006) and Cooper et al. (2006a), we used Monte Carlo simulations to conduct prospective power analyses to determine the level of murrelet population increase one could expect to detect if the four sites in the Cedar River drainage were resampled in 25 years (i.e., halfway through the CRMW HCP) and in 50 years (at the end of the HCP period) using methods that were identical to the ones used in 2005–2007. We analyzed landward radar counts of murrelets using Mixed Models in SPSS 14.0 (SPSS Inc., Chicago, Illinois). Because the Chester Morse site had much higher counts than the other 3 sites, we modeled the among-year and within-year variances separately from the other three sites. For each of the two analyses we ran a mixed model with year as a random effect and assumed the variances were normally distributed. Because models with more complex covariance structures failed to converge, we used a variance components covariance structure to model the among-year variation.

The mixed model estimated the among-year variance and we assumed the within-year variance for each site was equal to the variance of the residuals. Because the means and variances were similar among sites, we assumed that the three lower count sites (i.e., the Powerline sites) had the same among year and within-year variances (Table 5). We assumed that the same sites would be

Table 5. Baseline levels of among-site variance, within-year variance, total variance, and coefficient of variation (CV) used in the generation of simulation data sets for landward radar counts at four sites in the Cedar River Municipal Watershed, Washington, 2005–2007.

Site	Among-year variance	Within-year variance	Total variance	CV
Chester Morse	6.41	14.72	21.14	1.30
Powerline South	0.08	0.53	0.62	1.73
Powerline Central	0.08	0.53	0.62	1.73
Powerline North	0.08	0.53	0.62	1.73

surveyed in future years and therefore did not estimate among-site variances. We calculated the total variance as the sum of the among-year and the within-year variances. We calculated coefficients of variation (CV) for each site as the square root of the total variance divided by the mean landward count (Table 5).

Using the actual average landward counts for each site, the estimated among-year and within-year variances (Table 5), and annual rates of increase, we generated 1000 random data sets for each rate of increase (i.e., for a 0.5%, 1%, 2%, 3%, 4%, 5%, and 10% annual increase in radar counts; Table 6). In order to account for expected increases in the variance of landward counts with increasing mean values in future years, we increased the variances to levels that kept the CV's constant. We assumed that an identical sampling strategy would be used in 25 years and 50 years as was used during 2005–2007 and that the population increased at a constant annual rate.

We analyzed the 1000 data sets for each different rate using mixed models and site as a fixed effect, year as a linear covariate, and ln (count + 1) as the dependent variable. We modeled all counts conducted at a site during a year using an autoregressive (1) covariance structure to account for among-count covariance. Because we were only interested in detecting increases in landward counts we used one-sided significance tests. We therefore calculated the power as the proportion of the 1000 analyses that had a significant year term ($p < 0.10$) and a parameter estimate for the change in landward counts by year that was greater than zero. We conducted analyses over a 25-year time span and a 50-year time span.

RESULTS

We recorded a total of 25 pre-sunrise murrelet targets on 20 mornings of radar observation in the CRMW during summer 2007 (Table 3, Appendix 3). An additional three mornings of radar sampling were cancelled by inclement weather. Of the 25 radar targets, eight (32%) were flying in a landward direction, 15 (60%) were flying in a seaward direction, and two (8%) were flying in "other" directions. We had no audio-visual observations of Marbled Murrelets during radar sampling.

DISTRIBUTION AND ABUNDANCE

Similar to 2005 and 2006, mean daily counts of landward radar targets generally were quite low in 2007. Mean landward counts ranged between 0 and 1 target per morning (Figure 4, Table 7). As in 2005 and 2006, the highest landward counts occurred at the Chester Morse site, which is situated at the bottleneck formed by the valley along Chester Morse Lake. No landward targets were observed at Powerline Central in 2007. Mean landward counts did not differ significantly between 2005, 2006, and 2007 ($F_{2, 6} = 2.138$, $P = 0.199$; Table 5) at four long-term radar sites (i.e., Chester Morse, Powerline North, Powerline Central, Powerline South).

Even though the range of daily landward counts varied by only a few birds, we still observed relatively high among-day variation in landward counts because of the low counts. Coefficients of Variation (CV's) ranged from 130% at Chester Morse to 173% at the three Powerline sites (Table 5).

Table 6. The average landward radar counts by year for each annual rate of increase used in the generation of simulated data sets for the Cedar River Watershed, Washington.

		Annual Increase						
Site	Years	0.5%	1%	2%	3%	4%	5%	10%
Chester Morse	2005–2007	3.55	3.55	3.55	3.55	3.55	3.55	3.55
	2030–2032	4.02	5.90	5.82	7.42	9.45	12.01	38.41
	2055–2057	4.55	7.56	9.54	15.54	25.20	40.66	416.20
Powerline South	2005–2007	0.45	0.45	0.45	0.45	0.45	0.45	0.45
	2030–2032	0.51	0.58	0.75	0.95	1.21	1.54	4.92
	2055–2057	0.58	0.75	1.22	1.99	3.23	5.21	53.36
Powerline Central	2005–2007	0.50	0.50	0.50	0.50	0.50	0.50	0.50
	2030–2032	0.57	0.64	0.82	1.05	1.33	1.69	5.42
	2055–2057	0.64	0.82	1.35	2.19	3.55	5.73	58.70
Powerline North	2005–2007	0.45	0.45	0.45	0.45	0.45	0.45	0.45
	2030–2032	0.51	0.58	0.75	0.95	1.21	1.54	4.92
	2055–2057	0.58	0.75	1.22	1.99	3.23	5.21	53.36

POWER TO DETECT INCREASES IN MURRELET COUNTS

We used Monte Carlo simulations to determine our power to detect increases in radar counts of murrelets as nesting habitat develops in the Cedar River drainage. This prospective power analysis indicated that we could expect to have adequate power (i.e., power > 0.8) to detect between a 2–3% annual increase in the murrelet counts at the Cedar River study sites in future years (i.e., in ~ 25–50 years; Figure 5). There were relatively minor differences in power detect annual increases >2% in radar counts between 25 years and 50 years (Table 8).

FLIGHT PATHS

Mean landward flight directions generally were centered along the main axis of the valley near each radar site (Figure 6). We also examined specific flight paths of all murrelet targets to obtain information on smaller-scale patterns of movement. At Powerline North, Powerline Central, and Powerline South, most of the movements were either inbound or outbound birds flying along the approximate axis of the Cedar River valley, although several targets traveling in "other" directions also were observed (Figure 7). As in previous years, nearly all of the 2007 targets at Chester Morse were flying over the lake along the approximate axis of the valley (Figure 8).

AUDIO-VISUAL SURVEYS

During summer 2007, we conducted 54 mornings of standard audio-visual surveys (plus one tandem visit) at sites with the best murrelet habitat in CRMW, and/or in areas of suitable habitat where radar observations in 2006 suggested presence of Marbled Murrelets (Figure 2, Table 4). We did not observe Marbled Murrelets during any of our five protocol survey visits at the 155.1A, Chester North, Lindsay North, Lower Rex East (Findley), Rack Creek, South Fork North, South Fork Northeast, and Taylor Ridge North sites (Table 4). We also did not detect any murrelets during our single, late season, visit to the South Fork Taylor Creek site.

DISCUSSION

SUITABILITY OF CMRW FOR RADAR OBSERVATIONS

The CRMW is heavily forested and has very few natural or human-made openings, so there are few good radar sampling sites in the area.

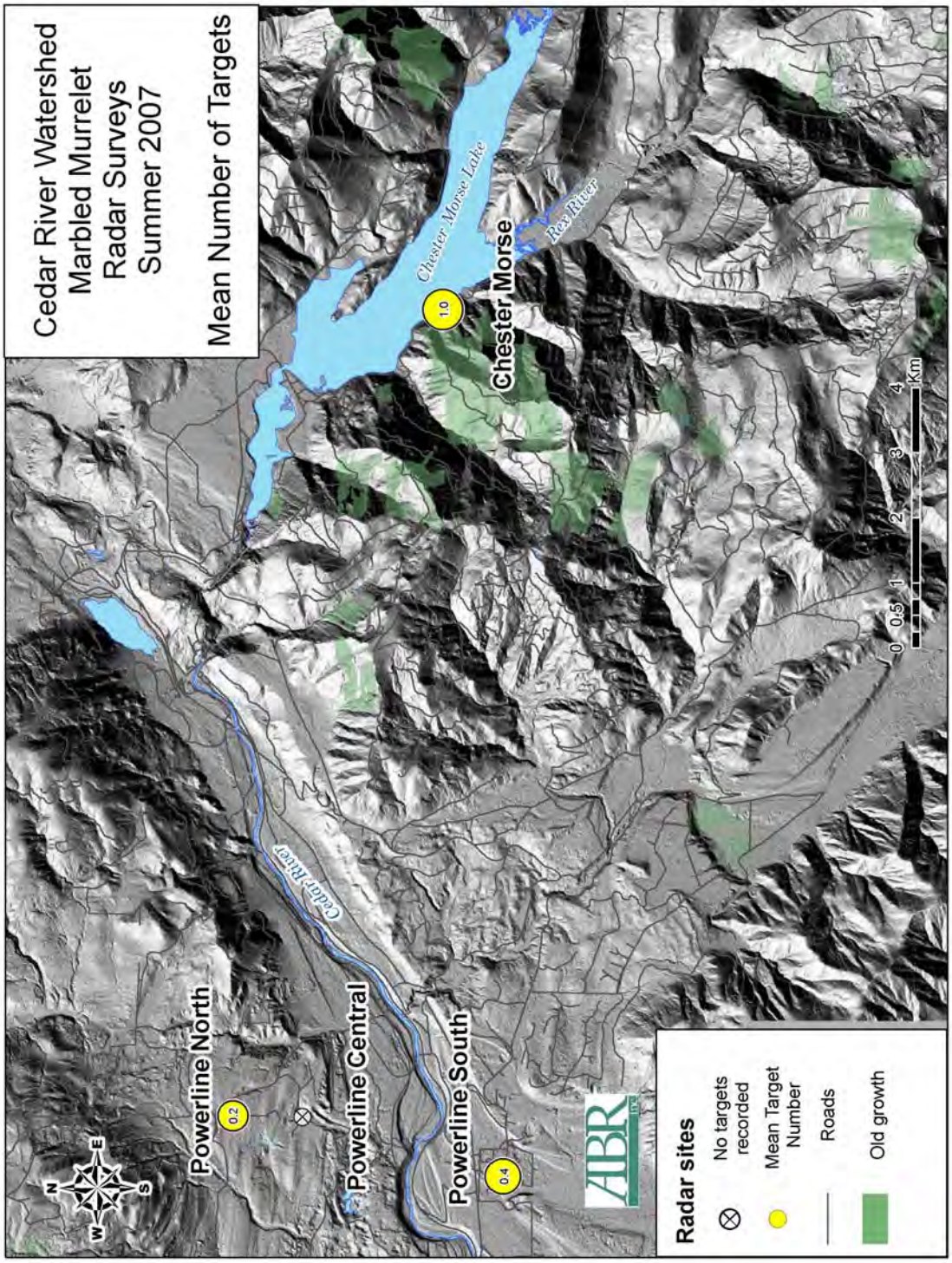

Figure 4. Map showing the mean number of landward targets/day observed on radar at each site in the Cedar River Municipal Watershed, Washington, during summer 2007. Sizes of circles are proportional to the mean rate; numbers within the circles are the actual means.

Table 7. Mean counts (targets or flocks/day ± 1 SE) of radar targets by flight direction at sites in the Cedar River Municipal Watershed, Washington, during summer 2005, 2006, and 2007. Table excludes data for days with high winds or persistent precipitation; counts only include targets recorded before sunrise. *n*=number of sampling days.

		Mean number of targets recorded on radar			
Site	Year	Landward-flying	Seaward-flying	Other directions	n
LONG-TERM SITES					
Powerline North	2005	0.7 ± 0.7	0.0 ± 0.0	0.0 ± 0.0	3
	2006	0.7 ± 0.3	1.0 ± 0.6	1.0 ± 0.6	3
	2007	0.2 ± 0.2	0.4 ± 0.4	0.2 ± 0.2	5
Powerline Central	2005	1.0 ± 0.4	1.8 ± 0.9	0.0 ± 0.0	4
	2006	0.7 ± 0.7	0.3 ± 0.3	1.3 ± 0.9	3
	2007	0.0 ± 0.0	1.0 ± 0.8	0.2 ± 0.2	5
Powerline South	2005	1.0 ± 0.6	0.3 ± 0.3	0.3 ± 0.3	3
	2006	0.0 ± 0.0	3.7 ± 2.7	0.7 ± 0.3	3
	2007	0.4 ± 0.4	0.8 ± 0.6	0.0 ± 0.0	5
Chester Morse	2005	7.3 ± 3.5	2.7 ± 1.5	0.0 ± 0.0	3
	2006	4.0 ± 2.1	1.7 ± 0.7	0.0 ± 0.0	3
	2007	1.0 ± 1.0	0.8 ± 0.6	0.0 ± 0.0	5
155.1A	2005	2	0	0	1
	2006	0.0 ± 0.0	2.0 ± 0.6	0.3 ± 0.3	3
South Fork	2005	0	1	1	1
	2006	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	3
SHORT-TERM SITES					
Education Center	2005	1	2	0	1
	2006	0.0 ± 0.0	0.0 ± 0.0	0.5 ± 0.5	2
West Point	2005	1	2	0	1
	2006	2.0 ± 2.0	0.5 ± 0.5	1.5 ± 0.5	2
Taylor Ridge	2005	0	0	0	1
	2006	0.0 ± 0.0	0.0 ± 0.0	1.0 ± 1.0	2
Rack Creek	2005	4	0	0	1
	2006	1.0 ± 1.0	0.5 ± 0.5	0.0 ± 0.0	2
Lindsay	2005	0	0	0	1
	2006	1.0 ± 1.0	1.0 ± 1.0	0.0 ± 0.0	2
Chester North	2006	0.5 ± 0.5	0.0 ± 0.0	0.0 ± 0.0	2
Upper Rex	2005	1	0	0	1
	2006	1.5 ± 0.5	0.0 ± 0.0	0.5 ± 0.5	2
Rex Stand	2005	0	1	0	1
	2006	1.0 ± 0.0	1.0 ± 1.0	0.0 ± 0.0	2
Lower Rex	2005	0	0	1	1
	2006	0.5 ± 0.5	1.0 ± 1.0	0.0 ± 0.0	2
Findley	2005	0	0	0	1
	2006	2.5 ± 0.5	0.5 ± 0.5	0.5 ± 0.5	2

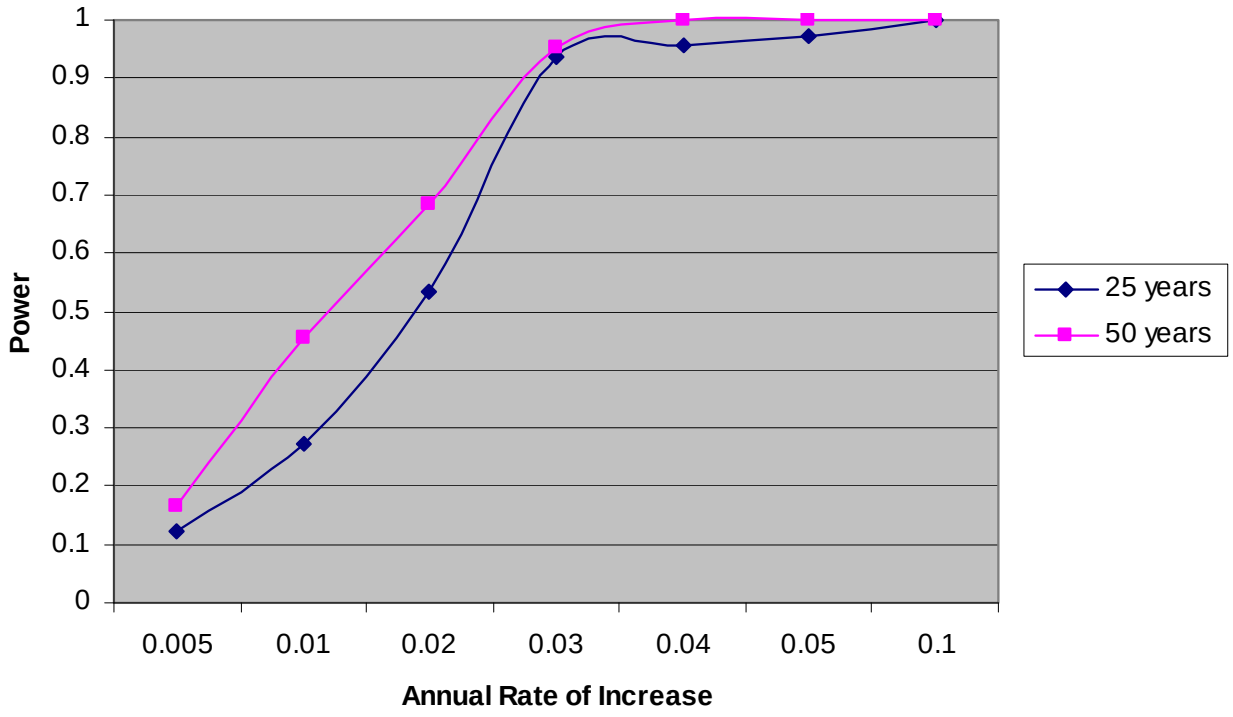

Figure 5. Estimates of statistical power to detect annual increases in landward radar counts at four sites in the Cedar River Municipal Watershed, Washington, in 25 years and in 50 years.

Table 8. Estimates of statistical power to detect increases in landward radar counts at four sites in the Cedar River Municipal Watershed, Washington, in 25 years (i.e., 2030–2032) and in 50 years (i.e., 2055–2057).

	Power to detect increase	
Annual Increase (%)	In 25 years	In 50 years
0.5	0.121	0.166
1	0.272	0.456
2	0.535	0.685
3	0.936	0.954
4	0.956	1.000
5	0.973	1.000
10	1.000	1.000

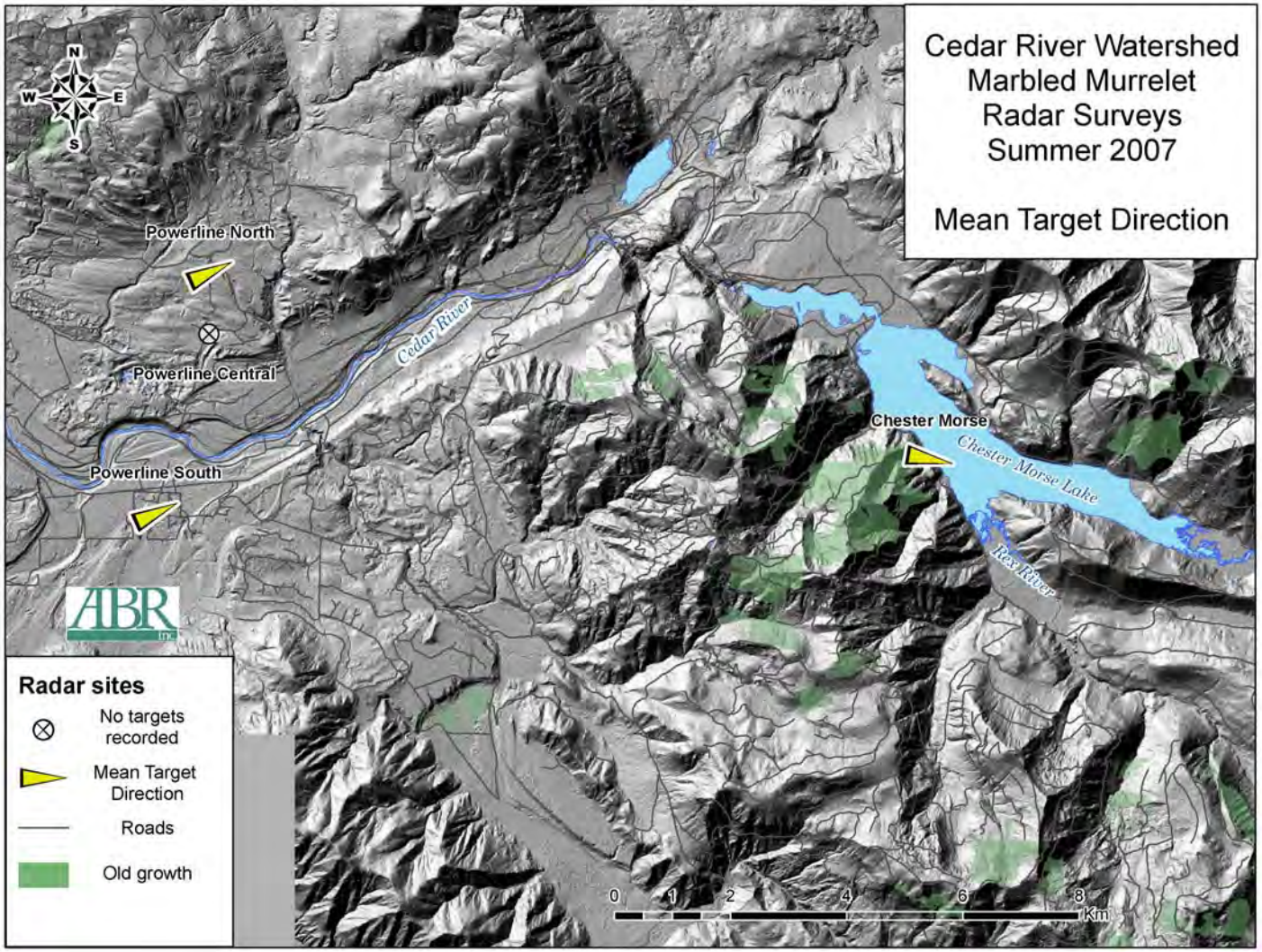

Figure 6. Map showing the mean flight direction of landward targets observed on radar at each site in the Cedar River Municipal Watershed, Washington, during summer 2007. Arrows indicate the mean direction of flight; sites without an arrow are locations where no landward targets were detected.

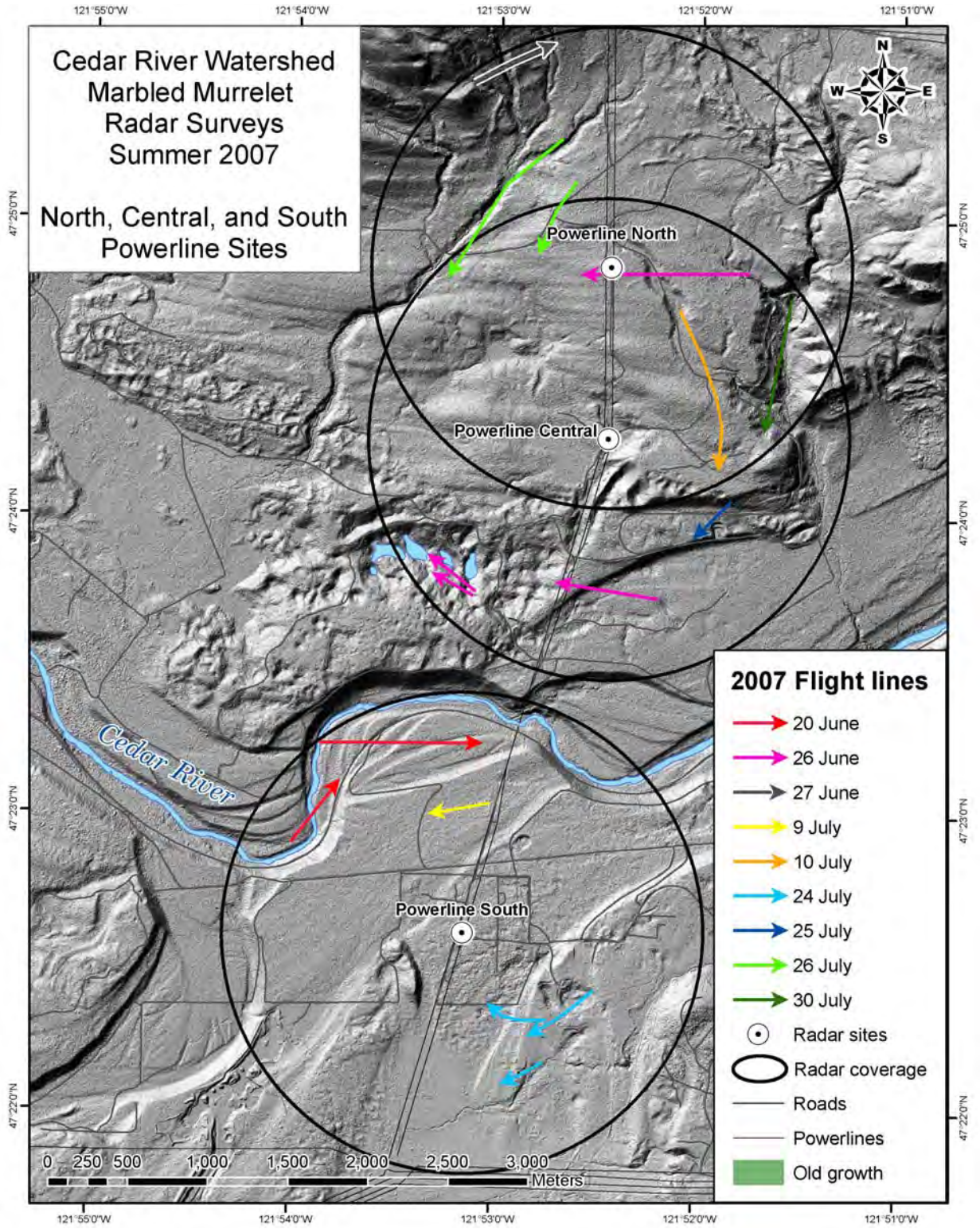

Figure 7. Map showing the flight paths of radar targets observed before sunrise at the Powerline North, Powerline Central, and Powerline South sites in the Cedar River Municipal Watershed, Washington, during summer 2007. Note that the 1.5-km ring denotes the maximal range of the radar, but there were gaps in radar coverage within that range because of radar shadows and ground clutter.

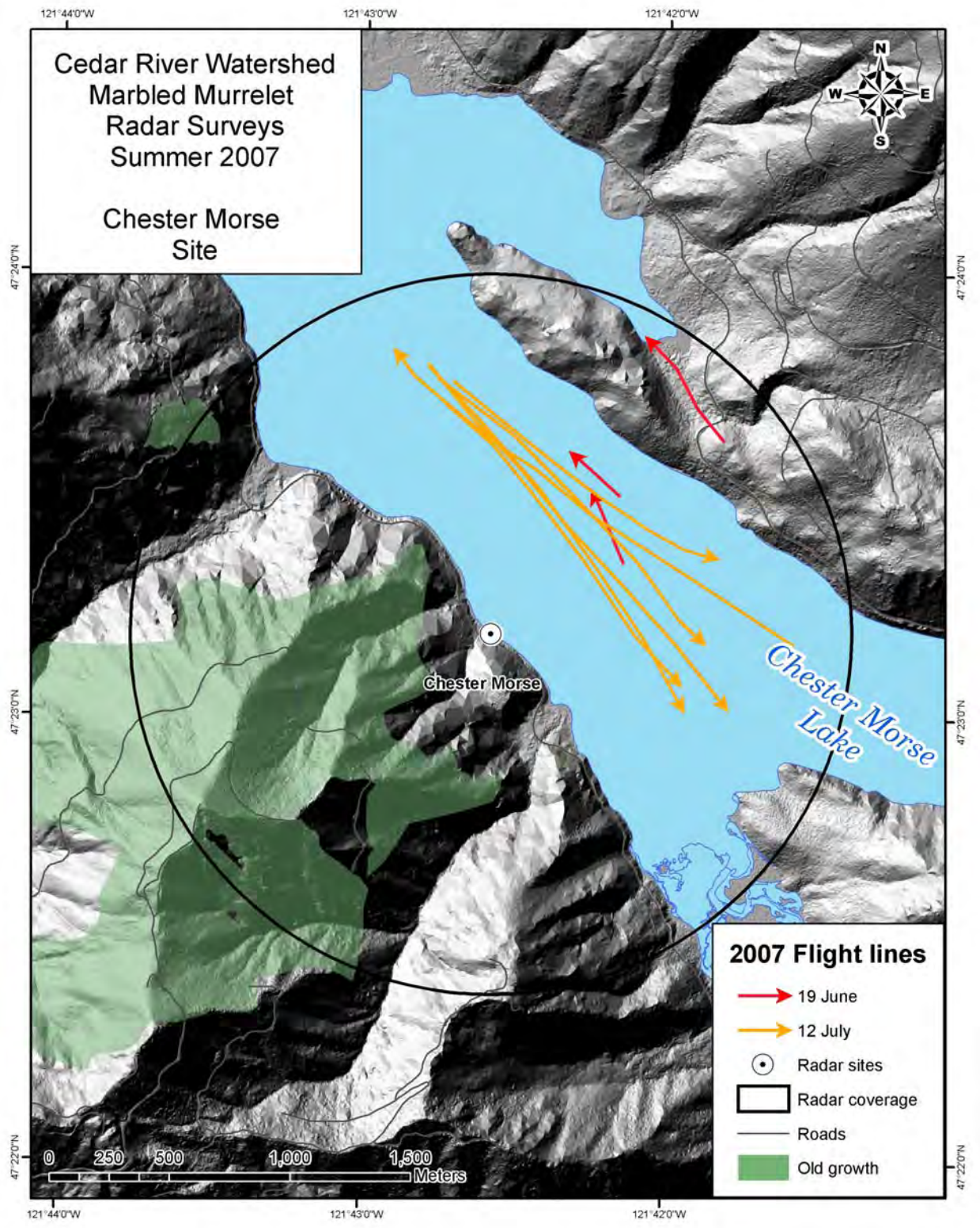

Figure 8. Map showing the flight paths of radar targets recorded before sunrise at the Chester Morse site in the Cedar River Municipal Watershed, Washington, during summer 2007. Note that the 1.5-km ring denotes maximal range of the radar, but there were gaps in radar coverage within that range because of radar shadows and ground clutter.

Fortunately, we were able to find excellent sites at key locations for long-term sampling. The three long-term sites located along the wide powerline corridor near the western border of the CRMW (i.e., Powerline North, Powerline Central, and Powerline South) are good sampling sites, but will have good radar-sampling views in the future only if there is long-term maintenance of a wide powerline corridor. The Chester Morse site offers an excellent view over Chester Morse Lake, across the entire width of the Cedar River Valley, and should remain a good sampling site well into the future with minimal management effort. Along with the good radar view over the lake, an additional benefit of the Chester Morse site is that it is located at a topographical bottleneck that helps funnel most Marbled Murrelets in the area through the radar-sampling zone.

The three Powerline sites were placed to provide the best possible radar coverage of the western edge of the CRMW. The Powerline North and Powerline Central sites are within 1.5 km of each other, so there is some overlap in radar coverage, but there was no spatial overlap in targets detected at the two sites during concurrent sampling in 2005 or in 2006 (Cooper et al. 2006b, 2007). This apparent lack of overlapping targets probably occurred because of differences in altitudinal bands that were sampled and because ground-clutter patterns differed between the two sites; therefore, we did not conduct concurrent sampling at the two sites during 2007.

Judging by the higher counts at Chester Morse (~7, ~4, and ~1 targets/day in 2005, 2006, and 2007 respectively) than at all three powerline sites combined (~3, ~2, and ~0 targets/day in 2005, 2006, and 2007 respectively), it is likely that some murrelets are entering and exiting the western end of the CRMW over areas not covered by the three Powerline sites (e.g., areas to the north or south of those sites). Unfortunately, no additional radar sites were available to cover those areas to the north or south of the existing Powerline sites; however, the Powerline sites should still provide a good index of abundance for monitoring.

All short-term radar sites sampled in 2005 and 2006 were in locations where trees will grow large enough to obscure the radar view within a few years. There are only a few additional sites where radar observations are currently possible in the CRMW besides those sampled in 2005 and 2006, with each of them being likely to be obscured by tree cover in the future. Thus, both those additional sites and the short-term radar sites probably are of minimal value for future monitoring purposes.

SPECIES IDENTIFICATION

Band-tailed Pigeons were common in the CRWM, and Common Loons (*Gavia immer*) were seen flying over Chester Morse Lake. Both of these species can be confused with Marbled Murrelet targets on radar, suggesting the need to continue the dawn cutoff time for observations and the continued need for target confirmation by audio-visual observers during radar surveys. We have found that Band-tailed Pigeon activity generally does not start until a few minutes after sunrise (i.e., 105 min after our radar surveys begin), so a sunrise cutoff time is very effective in minimizing contamination of the radar data. Further, nearly all murrelets fly into nesting stands well before sunrise (Burger 1997, Cooper et al. 2001), so there is little risk of missing the majority of landward flights, even with a sampling-cutoff time of sunrise. Others also have used sunrise for their cutoff time for radar monitoring of Marbled Murrelets (Burger 2001, Burger et al. 2005). In future years, we recommend that observers continue to attempt to get visual verification on as many targets as possible, however, and not solely rely on the timing of sampling to eliminate non-murrelet targets from the radar data.

DISTRIBUTION AND ABUNDANCE

Our radar counts in the CRMW were lower than those at most locations on the Olympic Peninsula (Cooper et al. 2001; 2006a), the Oregon coast (Cooper et al. 2000), and California (Cooper et al. 2005), which is no surprise given the much smaller amount of nesting habitat in the CRMW and the large distance from many parts of the CRMW to ocean foraging areas. In contrast, our CRMW radar counts generally were similar to those at other sites far inland in the Washington Cascades (Cooper et al. 1999; Cooper and Blaha 2001a, 2001b; ABR, Inc. 2005). In Washington, the most-inland known Marbled Murrelet nest location is 35 km, and the most-inland occupied site is 84 km (Evans Mack et al. 2003). The upper

reaches of the CRMW is ~70 km inland (i.e., approaching the limit of murrelet distribution in Washington).

The lack of nesting platform structure is another possible explanation for the low number of targets in the CRMW. Much of the current old-growth habitat in CRMW is above 1,000 m in elevation and lacks abundant nest platforms. Nests normally occur below 1,000 m because the trees at higher elevations often lack the structural features that form platforms (Nelson 1997, Burger 2002). Because of this general relationship between altitude and nest platform densities, it is likely that the lower-elevation lands in the western portion of the CRMW ultimately could develop higher platform densities than the eastern (higher) half of the CRMW. Note that nests have been found up to 1,530 m asl, however, so elevation per se should not be used to assess habitat suitability in the future. Instead, habitat suitability should be based on the availability of nesting platforms and other features common to known nest sites. For example, sites with the highest likelihood of nesting murrelets generally have more potential nesting platforms, larger trees, and greater moss cover on tree limbs than do other sites (Grenier and Nelson 1995, Hamer 1995, Kuletz et al. 1995, Nelson 1997, Burger 2002). Specifically, murrelet nesting and activity usually is positively associated with: older stands of trees, tree diameter (dbh), density of large (dbh >80 cm) trees/ha, areas with larger basal area of trees, areas with greater vertical complexity in canopy structure, areas with greater epiphyte cover on branches, areas with a higher density of potential nesting platforms, areas in lower elevations and areas >500 m from the coastline.

The flight directions that we observed on radar mostly followed the main axis of valleys, except in some cases where local movements into, or toward, patches of potential nesting habitat suggested possible use of those patches by nesting or prospecting murrelets. For example, our 2005 radar data suggested that Marbled Murrelets might be using old-growth patches in West Point, Rack Creek, Rex Stand, Upper Rex, and South Fork (and perhaps the old-growth patch southwest of the Lower Rex site). The 2006 radar data suggested possible murrelet use of habitat near West Point, Rack Creek, Taylor Ridge, Chester North, 155.1A, Findley, Rex Stand, Upper Rex, and Lindsay Creek. When habitat with nesting platforms was found in these areas, we conducted audio-visual surveys to help verify presence of murrelets. Murrelet presence (and occupancy) was verified in Rex River drainage in 2005 (Cooper et al. 2006b) and near the confluence of the North Fork and South Fork of the Cedar River in 2006 (Cooper et al. 2007). No murrelets were detected during audio-visual surveys in 2007. Thus, we documented murrelet occupancy in two areas of the CRMW during these studies, but radar observations in additional areas (especially West Fork, 155.1A, South Fork Northeast, and South Fork Taylor Creek where audio-visual were not conducted for a full two years) suggest the possibility that there could be low numbers of murrelets nesting in a few additional areas of the CMRW besides the two documented sites.

USE OF RADAR TO MONITOR TRENDS OF MURRELETS

Factors known to affect murrelet activity during the breeding period include human activities (e.g., recreation and timber harvesting; Carter and Erickson 1992, Hebert and Golightly 2006), oceanic conditions (Ainley et al. 1994, Oedekoven et al. 2001), and predator activity (Hebert and Golightly 2007). In particular, changes in ocean conditions, such as those that occur as the result of the El Niño–Southern Oscillation (ENSO) and the Pacific Decadal Oscillation, (PDO) have been linked to changes in diet, productivity, survival, and distribution of Marbled Murrelets along the Pacific coast (Ainley et al. 1995, Becker 2001, Becker and Beissinger 2003, Peery et al. 2006, Becker et al. 2007) and has been associated with widespread reproductive failure in several species of seabirds in the northeastern Pacific (Hodder and Graybill 1985, Ainley and Boekelheide 1990, Wilson 1991). There is evidence from central California indicating that nonbreeding murrelets rarely fly inland during the breeding season, which suggests that lower radar-based counts should occur during years of poor breeding effort and that they are essentially indices of the potential breeding effort in that area (Peery et al. 2004, Bigger et al. 2006). In contrast, Cooper et al. (2006a) did not find a relationship

between oceanographic conditions and radar counts on the Olympic Peninsula, Washington, during 1996–2004, which included the strong 1998 ENSO event. In combination, the Cooper et al. (2006a) results and lack of a strong ENSO event in 2005–2007 suggest to us that radar counts should have been somewhat average in the study area during 2005–2007. Not surprisingly, no statistically significant differences in radar counts of Marbled Murrelets in the CRMW were detected during the course of our study (i.e., during 2005–2007).

In this first three years of study, we found high Coefficients of Variation (CVs) in landward radar counts at our long-term sites (i.e., 130–170%). These values suggest that there generally was high among-day variation in CRMW radar counts compared to counts at many other locations. For example, CVs of landward radar counts were 28% in the Olympic Peninsula (Cooper et al. 2001), 10–55% in Oregon (Cooper et al. 2000, Cooper and Augenfeld 2001), and 23–25% in California (Cooper et al. 2005, Bigger et al. 2006). Note that most of the sites in these cited studies had much higher daily counts than the extremely low counts that we observed in the CRMW, which could have contributed to the higher percent variation we had in the current study. To help put some of those CV's into perspective, power analyses on the Olympic Peninsula radar data (Cooper et al. 2006a) indicated that they had high power (≥80%) to detect a 2%/yr decline in 15 years with ~3 surveys/year at their seven sites. Bigger et al. (2006) did a radar study in northern California and determined it would take 22 sites surveyed 4 times/yr to detect a 2.5%/yr decline in 10 years, with the same (≥80%) power.

In spite of the fact that our CVs at CRMW suggest that we have much lower power than other radar studies to detect changes in radar counts, our prospective power analysis indicated that we could expect to have adequate power (i.e., power > 0.8) to detect between a 2–3% annual increases in the murrelet counts at the Cedar River study sites in future years (i.e., in 25–50 years). Thus, it appears that the radar technique will be able to detect fairly small annual changes in murrelet numbers in future years.

Interestingly, there were not dramatic differences in power to detect increases in radar counts between the 25-year sampling interval and the 50-year sampling interval. We speculate that the likely reason for this was that with small rates of increase, there was little increase in populations even after 50 years, and with large rates of increase the increases were so large that the power was high even at 25 years. The relatively small differences in power at intermediate rates may have been, in part, due to random variation in the results of a power analysis with 1000 simulations.

MONITORING TRENDS IN DIFFERENT AREAS OF THE WATERSHED

Although the western portion of the CRMW currently is largely devoid of Marbled Murrelet nesting habitat, it will likely have significant amounts of habitat develop over the next 50 years. Thus, there is interest in being able to separately determine local population trends of murrelets between the western portion and the eastern portion of the watershed. The Chester Morse site should provide good trend information for the eastern half of the CRMW. Trends in the western half of the CRMW could be difficult to determine, however, since the Powerline sites would sample murrelets using the eastern half of the CRMW in addition to birds using the western half. During 2005 and 2006, we attempted to use the mean landward count at Chester Morse as an index of murrelet levels in the eastern side of the CRMW and the difference between the Chester Morse site and the sum of the three Powerline sites as an index of murrelet abundance in the western side. The major problem with this approach is that it assumes that the Powerline site samples all the birds that later pass by the Chester Morse site, which we have found is not true; the mean count at the Chester Morse site always was higher than the sum of counts at the three Powerline sites. Thus, it is likely that some murrelets are accessing the CRMW over areas that are not sampled by the Powerline sites. In 2005 and 2006, we attempted to correct the Powerline counts for a "detectability" factor to help account for the proportion of birds flying into the western portion of CRMW beyond the radar coverage of the three powerline sites (i.e., either north of, south of, or between the three sites), however, that detectability metric could not be used in future years without making the assumption that murrelet flight paths would not

change in future years (i.e., that the proportion of birds using the CRMW that also flew over the three Powerline sites would remain the same). This assumption is unlikely to be true in the future, because habitat development in new areas will almost certainly affect murrelet flight path locations in and out of the area. Thus, the monitoring scheme we have developed for the CRMW will be applicable to the entire area in future years, but probably will not provide solid insights into separate trends for the eastern and western portions of the area.

SUMMARY OF 2005–2007 STUDIES

During 2005–2007, we established four long-term radar monitoring stations in the CRMW for marbled murrelets. Baseline data were collected and power analyses indicated that we could expect to detect between a 2–3% annual increase in radar counts when surveys are conducted using similar methods in ~25 and 50 years. We also used a combination of radar and audio-visual techniques combined with murrelet nest habitat surveys to determine current nesting locations of murrelets in the CRMW. We verified murrelet use at two sites (i.e., Rex River and confluence of North Fork and South Fork Cedar River). Additional radar sightings in areas that had some nesting habitat but were not surveyed for a full two years suggested that low numbers of murrelets also were possible at a few other areas within the CRMW (i.e., at West Fork, 155.1A, South Fork Northeast, and South Fork Taylor) besides the two documented sites.

For future radar monitoring efforts, it is imperative that wide openings are maintained around the Powerline radar sites and at the Chester Morse radar site, so that vegetation does not obscure the radar view and thus impede radar sampling. We also suggest continuing to use the sunrise sampling cut-off time to eliminate Band-tailed Pigeons from the data during future radar sampling. Further, we suggest continued efforts to get visual confirmation of all radar targets to help eliminate waterfowl (e.g., loons) over Chester Morse Lake and the occasional Band-tailed Pigeon that is active prior to sunrise. Sampling methodology and radar specifications used in the future obviously need to remain consistent with those used in 2005–2007, so that future data will be comparable to findings from the first three years of study.

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Appendix 1. Photographs of radar sampling sites in Cedar River Watershed, Washington, 2007.

View toward the east at the Powerline North site.

View toward the north at the Powerline North site.

Appendix 1. Continued.

View toward the southeast at the Poweline Central site.

View toward the south at the Powerline South site.

View toward the east at the Chester Morse site.

View toward the east at the Chester Morse site.

Appendix 1. Continued.

View toward the northwest at the 155.1A site.

View toward the north at the South Fork site.

Appendix 1. Continued.

View toward the southwest at the Education Center site.

View toward the northwest at the West Point site.

View toward the northwest at the West Point site.

View toward the west at the Taylor Ridge site.

View toward the north at the Lindsay site.

Appendix 1. Continued.

View toward the north at the Rack Creek site.

View toward the north at the Rack Creek site.

View toward the northwest at the Chester North site.

View toward the southeast at the Chester North site.

Appendix 1. Continued.

View toward the west at the Upper Rex site.

View toward the southwest at the Lower Rex site.

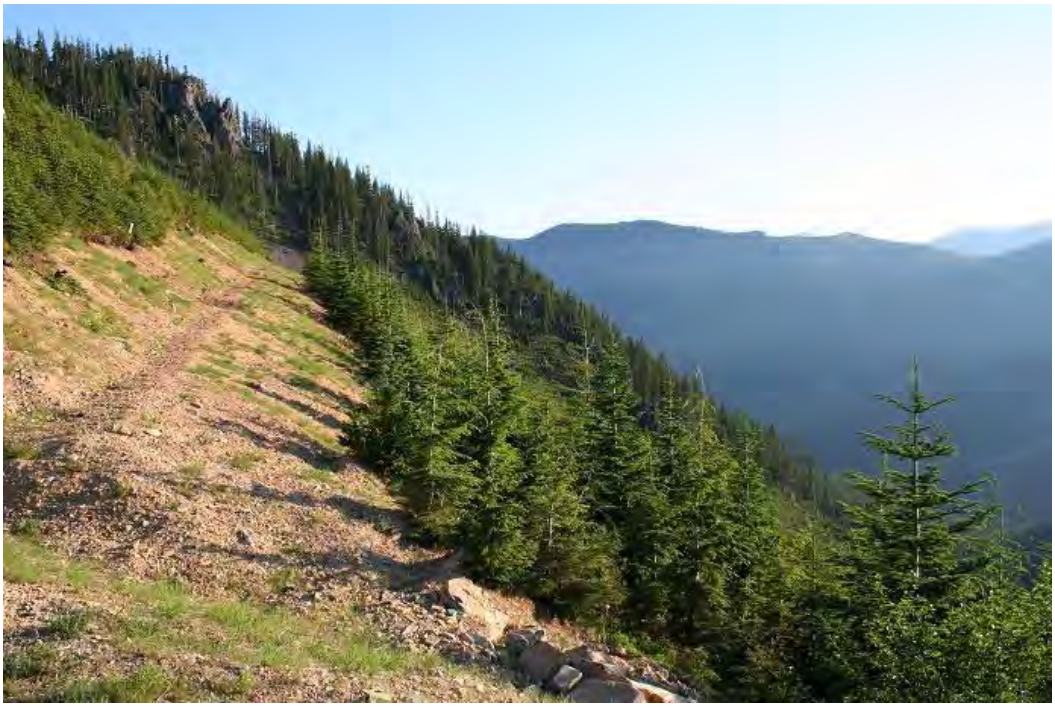
View toward the west at the Rex Stand site.

View toward the east at the Rex Stand site.

Appendix 1. Continued.

View toward the southwest at the Findlay site.

View toward the northeast at the Findlay site.



Appendix 2. Coding information for radar surveys of Marbled Murrelets in the Cedar River Municipal Watershed, Washington, summer 2007.

GENERAL CODES

OBSERVER

1 = Brian A. Cooper (BAC)
2 = Richard J. Blaha (RJB)
3 = Peter M. Sanzenbacher (PMS)
4 = Jeff Barna (JBB)
5 = Corey M. Grinnell (CMG)
6 = Jon H. Plissner (JHP)
7 =
8=

STUDY SITE

1 = Chester Morse
2 =Cedar
3 =Power Line South
4 = Power Line Central
5 = Power Line North
6 =South Fork
7 =Cedar
8 =Upper Rex
9 = Lower Rex
10 =West Point
11 = Taylor Ridge
12 =Site 150
13 = Rex Stand
14 = Rack Creek
15 = Findlay
16 = Site 155.1A
17 = Lindsay
18 = Education Center
19 =AV1
20 =AV2
21 = Chester North

SESSION NUMBER (IF USED AT ALL)

(Write as the three-digit Julian date, a decimal point, and a two-digit number counting from 1 through *n* that represents the sequential sample taken. For example, the fifth sampling period on Julian date 182 would be 182.05. Format is XXX.XX; write XXX.00 if the session has to be canceled [e.g., because of weather], then continue the next session with the same number that you had been trying to use.)

TIME

(Write in 24-hour clock. Remember--midnight is 0000 h, **not** 2400 h.)

DATE

(People writing on forms should enter as, for example, “6 MAR” or “8 APR.” Keypunchers should enter as mo/dy/yr, as in 9/30/95.)

JDATE

(Enter the Julian date + 2,006,000)

Appendix 2, continued.

WEATHER CODES AND MEASUREMENTS

WIND DIRECTION

(**Direction** on the ground **from which the wind is blowing**, to the nearest ordinal point. Be sure to use the local declination to correct the compass reading.)

0 = unknown/default
1 = North
2 = Northeast
3 = East
4 = Southeast
5 = South
6 = Southwest
7 = West
8 = Northwest
9 = direction is variable or no wind

WIND SPEED (mph)

(Sustained average speed at ground level, -9 = default/unknown)

0 = Calm
1 = 1-5 mph
2 = 6-10 mph
3 = 11-15 mph
4 = 16-20 mph
5 = 21-25 mph
6 = 26-30 mph
7 = 31-35 mph
etc., etc.....

ESTIMATED CLOUD COVER (to the nearest 5%)

(Estimated for the area from the coast to the mountains north of the site.)

-9 = unknown/default

CEILING HEIGHT

(An average height, taken from where you are in m agl, so either in a particular section or at the radar lab. Haze that allows a distinct shadow to be cast is counted as clear sky, whereas haze that causes indistinct shadows is counted as clouds. The same is true at night, when you can see stars and the moon through the haze.)

-9 = clear sky -99 = unknown/default

MINIMAL VISIBILITY

(Record the minimal distance you can see. If you are high on a ridge, use the minimal horizontal distance, for you may be able to see lower elevations clearly but nothing up high.)

0 = unknown/default
1 = 0-50 m
2 = 51-100 m
3 = 101-500 m
4 = 501-1000 m
5 = 1001-2500 m
6 = 2501-5000 m
7 = >5000 m

Appendix 2, continued.

WEATHER CODES AND MEASUREMENTS (CONTINUED)

PRECIPITATION

(Precipitation is considered to occur if it is recorded anywhere within ~5 km of the site.)

99 = unknown/default

0 = none
1 = fog
2 = drizzle (heavy mist)
3 = light rain (continuous drops of rain)
4 = heavy rain
5 = scattered showers
6 = snow flurries
7 = light snowfall
8 = heavy snowfall
9 = sleet
10 = hail

AIR TEMPERATURE (to the nearest 1°C)

(Be sure to keep the thermometer out of direct sunlight.)

99 = unknown/default

RADAR CODES AND MEASUREMENTS

TIME

(Write in 24-hour clock. Remember--midnight is 0000 h, **not** 2400 h.)

TARGET MULTIPLIER

(Record the number of targets flying "in a similar direction and fashion" and crossing the same segment. This category will be "1" for times when movement rates are so slow that you can record data for individual targets but will be, for example, "7" for seven targets flying the same direction and fashion during periods of high movement rates.)

0 = default

DIRECTION OF FLIGHT (to the nearest 1°)

(Measured on the radar display with the Electronic Bearing Line [EBL].)

999 = default

TRANSECT CROSSED

(That primary transect line that a bird did cross or would have crossed if you extrapolated its directional flight pattern. **Transect lines are extrapolated all the way off the screen.**)

0 = default
1 = Northern Transect
3 = Eastern Transect
5 = Southern Transect
7 = Western Transect

MINIMAL DISTANCE (to the nearest meter)

(The smallest distance to the radar lab that a target became or would become if you extrapolated its flight direction.)

999 = default

VELOCITY (to the nearest 5 **mph**) Speeds **NOT to be recorded in KPH!!**

(Measured on the radar display with the hand-held speed scales.) 0 = default

Appendix 2, Continued.

RADAR MEASUREMENTS AND CODES (CONTINUED)

FLIGHT BEHAVIOR

(Some erratically-flying or circling birds still may have an overall direction of movement; if so, record that overall direction. Otherwise, their direction is 999.)

0 = default/unknown	4 =
1 = straight-line (directional)	5 =
2 = circling (NOTE: Direction may be 999.)	6 =
3 = erratic (NOTE: Direction may be 999.)	7 =

OVERLAP

0 = default/unknown
1 = seen on radar only
2 = observed on radar and audiovisually
3 = observed audiovisually only

SPECIES (if known)

(Write in the 4-letter code in the field; **If the species is unknown, leave the space blank. If have a target that is fast enough to be a murrelet (i.e., >40 mph), but you have a strong indication by target shape or behavior that it is not, enter "NOMU" and note reasons for classification in margin.**)

NUMBER OF BIRDS IN THAT TARGET (if known)

0 = default (**If the number of birds is not counted, leave the space blank.**)

DATE

JDATE (add a 2006 before the jdate, e.g., 1 Jan 1999 = 2006001)

OBSERVER 1 (BAC = 1, RJB = 2, etc.).

OBSERVER 2 (Enter 0 if only one observer.)

FLIGHT ALTITUDE **If flight altitude is ≤25 m agl, estimate it as closely as possible to the nearest meter; if it is 26-50 m, estimate it to the nearest 2-3 m; if it is >50 m agl, your estimate will be more approximate and in categories of at least 5 m.**) 0 = default

HEARSEE

Was bird heard, seen, or both? (0 = default or radar only, S = seen only, H = Heard only, B = Both seen and heard)

Appendix 3. Data file for Marbled Murrelet targets recorded on radar in the Cedar River Municipal Watershed, Washington, during summer 2007. See Appendix 2 for coding information. Also, note that Appendix 3 does not contain the weather data, data on targets that were non-murrelets or that were recorded after sunrise, or data from dates when weather or other factors cancelled sampling.

TIME	MULT	DIR	TRAN	MINDIS	VEL	BEH	OV.LAP	SPP	NO	FLTALT	HEARSEE	DATE	JDATE	SITE
324	0	0	0	999	0	0	0	WDAT	0	0	0	19-Jun-2007	2,007,170	1
359	1	302	1	579	45	1	1		0	0	0	19-Jun-2007	2,007,170	1
407	1	272	1	864	50	1	1		0	0	0	19-Jun-2007	2,007,170	1
442	1	283	1	1280	52	1	1		0	0	0	19-Jun-2007	2,007,170	1
325	0	0	0	999	0	0	0	WDAT	0	0	0	20-Jun-2007	2,007,171	3
332	1	39	7	1177	42	1	1		0	0	0	20-Jun-2007	2,007,171	3
406	1	91	1	1211	45	1	1		0	0	0	20-Jun-2007	2,007,171	3
326	0	0	0	999	0	0	0	WDAT	0	0	0	26-Jun-2007	2,007,177	4
359	1	279	5	946	65	1	1		0	0	0	26-Jun-2007	2,007,177	4
404	1	271	1	1043	56	1	1		0	0	0	26-Jun-2007	2,007,177	4
455	1	313	5	1223	65	1	1		0	0	0	26-Jun-2007	2,007,177	4
456	1	311	5	1257	65	1	1		0	0	0	26-Jun-2007	2,007,177	4
326	0	0	0	999	0	0	0	WDAT	0	0	0	27-Jun-2007	2,007,178	5
506	1	65	1	1426	42	1	1		0	0	0	27-Jun-2007	2,007,178	5
335	0	0	0	999	0	0	0	WDAT	0	0	0	9-Jul-2007	2,007,190	3
520	1	259	1	822	42	1	1		0	0	0	9-Jul-2007	2,007,190	3
335	0	0	0	999	0	0	0	WDAT	0	0	0	10-Jul-2007	2,007,191	4
425	1	167	3	647	52	1	1		0	0	0	10-Jul-2007	2,007,191	4
337	0	0	0	999	0	0	0	WDAT	0	0	0	12-Jul-2007	2,007,193	1
420	1	268	1	737	42	1	1		0	0	0	12-Jul-2007	2,007,193	1
456	1	102	1	600	46	1	1		0	0	0	12-Jul-2007	2,007,193	1
457	1	88	1	837	49	1	1		0	0	0	12-Jul-2007	2,007,193	1
458	1	102	1	712	47	1	1		0	0	0	12-Jul-2007	2,007,193	1
502	1	108	1	546	42	1	1		0	0	0	12-Jul-2007	2,007,193	1
511	1	103	1	520	41	1	1		0	0	0	12-Jul-2007	2,007,193	1
347	0	0	0	999	0	0	0	WDAT	0	0	0	24-Jul-2007	2,007,205	3
523	1	232	3	760	44	1	1		0	0	0	24-Jul-2007	2,007,205	3
524	1	238	5	929	50	1	1		0	0	0	24-Jul-2007	2,007,205	3
530	1	288	5	419	50	1	1		0	0	0	24-Jul-2007	2,007,205	3
351	0	0	0	999	0	0	0	WDAT	0	0	0	25-Jul-2007	2,007,206	4
408	1	223	3	800	42	1	1		0	0	0	25-Jul-2007	2,007,206	4
352	0	0	0	999	0	0	0	WDAT	0	0	0	26-Jul-2007	2,007,207	5
436	1	228	8	752	45	1	1		0	0	0	26-Jul-2007	2,007,207	5
538	1	215	8	426	50	1	1		0	0	0	26-Jul-2007	2,007,207	5
357	0	0	0	999	0	0	0	WDAT	0	0	0	30-Jul-2007	2,007,211	5
522	1	192	3	1107	80	1	1		0	0	0	30-Jul-2007	2,007,211	5

Appendix 4. Data sheets for all audio-visual surveys for Marbled Murrelets in the Cedar River Municipal Watershed, summer 2007 (attached).

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMG

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month June Day 12 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Taylor Ridge Station Number: 1

Station Location - T 22 N, R 8 (circle one) (E) or W, S 26, QQ (1/16) NW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 594828 N (y) coordinate: 5247069 Source: GPS Datum: NAD83 FOM: –

Observer (s) Name: Corey M. Grinnell Initials: CMG Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 1053 Ft / (M) Position on Slope (circle one): **B**ottom/plain, **L**ower 1/3, **M**id 1/3, (**U**pper 1/3), **R**idgetop

Station Placement (circle one): (**I**nside), **O**utside

Distance from Survey Site Boundary: – Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): **1** = 0 to 25%, (**2** = 26 to 50%,) **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table:** North Bend **Begin Survey** Time: 0425 **End Survey** Time: 0625

Temperature at Sunrise: 3 ° Temperature at End of Survey: 4 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0425	HI	1	Y	Y	Y	N	N	N	0	N	Begin Survey
0625	HI	1	Y	Y	Y	N	N	N	0	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

[redacted]

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: CMG Month June Day 12 Year 2007 Site Name / No: Taylor Ridge

Data Reference Number: Units of Measure (circle one): **U.S.** / **Metric** Station Number:

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (meters) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0425															Begin Survey
	1	0625															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown. **(Check Reverse Side When Using 2-Sided Forms)**

heard PIWO

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y KMG

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Area Name: ~~Rock Creek Watershed~~ Cedar River Watershed Site Name / Number: Rock Creek Month 06 Day 12 Year 2007 Station Number: 1

Station Location - T 22 N, R 8 (circle one) (E) or W, S 24, QQ (1/16) NW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 596219 N (y) coordinate: 5248719 Source: GPS Datum: NAD83 FOM: —

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 934 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): Inside, (Outside)

Distance from Survey Site Boundary: 10 Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): (1 = 0 to 25%,) 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table:** North Bend **Begin Survey** Time: 0425 **End Survey** Time: 0625

Temperature at Sunrise: 3.2 ° Temperature at End of Survey: 5.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0425	UL	0	Y	Y	Y	N	L		1	B,A,C	Begin Survey, fog over lake
0510	UL	0	Y	Y	Y	N	L		1	B,A,C	Sunrise, fog over lake
0625	UL	0	Y	Y	Y	N	L		1	B,A,C	End Survey, fog over lake

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Date Point No. _____ Sequence No. _____ Reference No. _____
Quad. Code _____ Photo Code _____ General Location _____
Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____
Protocol Review Initials _____ Review Date _____ Highest Biological Status _____
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 | Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 06 Day 12 Year 2007

Site Name / No: Rock Creek

Data Reference Number:

Units of Measure (circle one): U.S. **Metric**

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0425															Begin Survey
		0425															1st HETH, 1st VATH,
		0425															1st OSFL
		0432															1st SOSP
		0443															1st COLO
		0451															1st RAOW
		0510															Sunrise
		0520															1st CORA
		0527															1st STJA
		0550															1st RBNU
		0602															1st RUHU
		0625															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Species of Concern: Common Loon

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 12 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lindsay Creek Station Number: 3

Station Location - T 21 N, R 9 (circle one) (E) or W, S 4, QQ (1/16) NW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 601178 N (y) coordinate: 5243286 Source: GPS Datum: NAD 83 FOM: -

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 849 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): Inside, (Outside)

Distance from Survey Site Boundary: 5 Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): **1** = 0 to 25%, **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table:** North Bend **Begin Survey** Time: 0425 **End Survey** Time: 0625

Temperature at Sunrise: 3.5 ° Temperature at End of Survey: 3.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0425	UL	0	Y	Y	Y	N	N	N	0	N	Begin Survey
0510	UL	0	Y	Y	Y	N	N	N	0	N	Sunrise
0535	HI	1	Y	Y	Y	N	N	N	1	N	
0617	UL	0	Y	Y	Y	N	N	N	1	N	
0625	UL	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0

Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month June Day 12 Year 2007

Site Name / No: Lindsay Creek

Data Reference Number:

Units of Measure (circle one): U.S. / **Metric** (circled)

Station Number: 3

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	End	#	OL	OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	/	0425															Begin Survey
	/	0608															Steller's Jay
	/	0625															End Survey

TYPE: H = Heard Only (no visual), S = Seen Only (silent), B = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): K = KEER calls, G = Groan (alternate) calls, O = Whistle or Soft Que calls, U = Unknown, — = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (Y or N).

AUDITORY - Other (Non-Vocal Sounds): W = Wing Sound, J = Jet Sound, — = None or N/A. If both are heard write W / J.

BEHAVIOR: F = Flight Over Canopy, C = Circle Over Canopy, T = Fly-Through At or Below Canopy (≤ 1.0), B = Circle At or Below Canopy (≤ 1.0), L = Seen Landing in or Departing From a Tree, S = Stationary Calling (fixed-point multiple calls <100 m), U = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAB

Total Detections: 0

Species of Concern (circle one, details on last pg.): **Y** or (**N**)

Month June Day 13 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lost Creek Station Number: 1

Station Location - **T** _____ **N, R** _____ (circle one) **E** or **W** , **S** _____, **QQ (1/16)** _____, **of Q (1/4)** _____

UTM zone: 10 E (x) coordinate: 594 882 N (y) coordinate: 525 0301 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Corey M. Gannell Initials: CMG Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 739 **Ft** / (**M**) Position on Slope (circle one): **Bottom/plain**, **Lower 1/3**, (**Mid 1/3**,) **Upper 1/3**, **Ridgetop**

Station Placement (circle one): (**Inside**,) **Outside**

Distance from Survey Site Boundary: — Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): **1** = 0 to 25%, (**2** = 26 to 50%,) **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 8.5 ° Temperature at End of Survey: 9 ° (circle one) (**C**) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0424	HI	3	Y	Y	Y	N	N	N	0	N	Begin Survey
0500	HI	3	Y	Y	Y	N	N	N	1	N	wind increased
0523	HI	3	Y	Y	Y	L	N	N	1	N	light rain
0539	HI	3	Y	Y	Y	N	N	N	0	N	light rain turned ended
0624	HI	3	Y	Y	Y	N	N	N	0	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

FOR DATABASE USE ONLY

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 | Pg. 2 of 2

Area Name: Cedar River watershed

Observer (s) Initials: CMG | Month June Day 13 Year 2007 | Site Name / No: Lost Creek

Data Reference Number: | Units of Measure (circle one): U.S. / (Metric) | Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (meters) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0423															Begin Survey
	1	0623															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **---** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Potential Predators: CORA, STJA

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y [illegible]

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 13 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Findley Creek Station Number: 1

Station Location - T 21 N, R 10 (circle one) (E) or W, S 6, QQ (1/16) SW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 606326 N (y) coordinate: 5243160 Source: GPS Datum: NAD83 FOM: [illegible]

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 958 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): **Inside**, **Outside**

Distance from Survey Site Boundary: 20 Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): (1 = 0 to 25%,) **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 8.5 ▯ Temperature at End of Survey: 8.0 ▯ (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	HI	3	Y	Y	Y	N	N	N	0	N	Begin Survey
0442	HI	3	Y	Y	Y	N	N	N	1	N	
0509	HI	3	Y	Y	Y	N	N	N	1	N	Sunrise
0534	HI	3	Y	Y	Y	L	N	N	1	N	
0547	HI	3	Y	Y	Y	N	N	N	1	N	
0624	HI	3	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0

Area Name: Findlay

Observer (s) Initials: AJM

Month June Day 13 Year 2007

Site Name / No:

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
I	1	0424															Begin Survey
I	2	0530															Steller Jay
I	3	0624															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Total Detections: 0

Species of Concern (circle one, details on last pg.): **Y** or (**N**)

Month 06 Day 13 Year 2007

Area Name: Cedar Creek Watershed Site Name / Number: Chester North Station Number: 3

Station Location - T 22 N, R 9 (circle one) (**E**) or **W**, S 16, QQ (1/16) NE, of Q (1/4) SW

UTM zone: 10 E (x) coordinate: 600811 N (y) coordinate: 5249252 Source: GPS Datum: NAD83 FOM: –

Observer (s) Name: Neil Jensen Initials: NEJ Affiliation: ABR, Inc Phone: (503) 359-7525

Station Elevation: 723 Ft / (**M**) Position on Slope (circle one): **Bottom/plain**, **Lower 1/3**, (**Mid 1/3**) **Upper 1/3**, **Ridgetop**

Station Placement (circle one): (**Inside**) **Outside**

Distance from Survey Site Boundary: NA Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): **1** = 0 to 25%, **2** = 26 to 50%, **3** = 51 to 75%, (**4** = 76 to 100%)

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 6.5 ° Temperature at End of Survey: 7.5 ° (circle one) (**C**) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	HI	3	Y	Y	Y	N	N	N	0	C	Begin Survey
0435	HI	3	Y	Y	Y	N	N	N	0	C,B	
0439	HI	3	Y	Y	Y	L	N	N	0	C,B	Drizzle
0446	HI	3	Y	Y	Y	N	N	N	0	C,B	
0507	HI	3	Y	Y	Y	N	N	N	1	C,B	
0509	HI	3	Y	Y	Y	N	N	N	1	C,B	Sunrise
0605	HI	3	Y	Y	Y	N	N	N	2	C,B	
0624	HI	3	Y	Y	Y	N	N	N	2	C,B	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 | Pg. 2 of 2

Area Name: Cedar Creek Watershed

Observer (s) Initials: NEJ

Month 06 Day 13 Year 2007

Site Name / No: Chester North

Data Reference Number:

Units of Measure (circle one): U.S. (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I/O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
I	1	0424															Begin Survey
I	2	0435															1st WIWR
I	3	0438															1st VATH
I	4	0441															1st DEJU
I	5	0455															1st PSFL
I	6	0509															Sunrise
I	7	0522															1st RBNU
I	8	0534															1st BRCR
I	9	0624															End Survey
I	10																
I	11																
I	12																
I	13																
I	14																
I	15																
I	16																
I	17																
I	18																
I	19																
I	20																
I	21																
I	22																
I	23																
I	24																
I	25																

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y GMR

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 14 Year 2007

Area Name: ~~Chester~~ Cedar Creek Watershed Site Name / Number: Taylor Ridge Station Number: 1

Station Location - T 22 N, R 8 (circle one) (E) or W, S 26, QQ (1/16) NW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 594828 N (y) coordinate: 5247069 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Neil Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 1053 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, Mid 1/3, (Upper 1/3) Ridgetop

Station Placement (circle one) (Inside,) Outside

Distance from Survey Site Boundary: NA Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%,) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 6.5 ° Temperature at End of Survey: 8.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	HI	3	Y	Y	Y	N	N	N	1	B,C	Begin Survey
0521	HI	3	Y	Y	Y	N	L	N	1	B,C	
0533	HI	3	Y	Y	Y	N	N	N	1	B,C	
0541	HI	3	Y	Y	Y	N	L	N	1	B,C	
0615	HI	3	Y	Y	Y	N	L	N	1	B,C,A	
0624	HI	3	Y	Y	Y	N	L	N	1	B,C,A	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
~~Cloud Cover~~: ~~**0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.~~
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar Creek Watershed

Observer (s) Initials: NEJ

Month 06 Day 14 Year 2007

Site Name / No: Taylor Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY					# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
					VOCAL SERIES				OTHER								
					Start	End	#	OL	W / J								
I	—	0424	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Begin Survey, 1st AMRO
I	—	0424	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st PSFL, 1st VATH
I	—	0435	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st DEJU
I	—	0438	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st WIWR
I	—	0441	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st RCCH
I	—	0442	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st HETH
I	—	0456	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st RBNU
I	—	0500	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st RECR
I	—	0504	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st RUHU
I	—	0509	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Sunrise
I	—	0518	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st OSFL
I	—	0531	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1st HAWO
I	—	0624	—	—	—	—	—	—	—	—	—	—	—	—	—	—	End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): N/CMG

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 14 Year 2007

Area Name: Cedar River Watershed Site Name / Number: 155.1A Station Number: 2

Station Location - T 22 N, R 10 (circle one) (E) or W, S 30, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 607568 N (y) coordinate: 5245843 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Corey M. Grinnell Initials: CMG Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 825 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, Mid 1/3, (Upper 1/3), Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: — Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%,) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 5.5 ° Temperature at End of Survey: 5.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	HI	3	N	Y	Y	N	N	N	0	N	Begin Survey - low clouds
0536	HI	2	Y	Y	Y	N	N	N	0	N	Clouds break
0612	HI	3	Y	Y	Y	N	N	N	0	N	Clouds return
0624	HI	3	Y	Y	Y	N	N	N	0	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Document No.: ____ Data Point No.: ____ Sequence No.: ____ Reference No.: ____
Quad Code: ____ Photo Code: ____ General Location: ____
Data Entry Initials: ____ Data Entry Date: ____ Data QC Initials: ____ Data QC Date: ____
Primary Review Initials: ____ Review Date: ____ Highest Biological Status: ____
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: CM6

Month June Day 14 Year 2007

Site Name / No: 105, 1A

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY					# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (meters) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
					VOCAL SERIES				OTHER								
					Start	End	#	OL	W / J								
	1	0 4 2 4															Begin Survey
	—	0 6 2 4															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Potential Predators: Douglas Squirrel

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Area Name: Cedar River Watershed Site Name / Number: South Fork Cedar River North Month June Day 14 Year 2007 Station Number: 2

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) NW, of Q (1/4) NW

UTM zone: 10 E (x) coordinate: 0611306 N (y) coordinate: 5242332 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 724 Ft / M Position on Slope (circle one): Bottom/plain, (Lower 1/3), Mid 1/3, Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: - Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25% (2 = 26 to 50%) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 6.5 D Temperature at End of Survey: 7.0 D (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	HI	3	Y	Y	Y	N	N	N	1	N	Begin survey
0509	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0624	HI	3	Y	Y	Y	N	N	N	0	N	End survey

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad. Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month June Day 14 Year 2007

Site Name / No: South Fork Cedar River North

~~Data Reference Number:~~

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY					# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
					VOCAL SERIES Start	VOCAL SERIES End	VOCAL SERIES #	VOCAL SERIES OL	OTHER W / J								
	/	0424															Begin Survey
	/	0608															Steller Jay
	/	0624															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): N CM

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): **Y** or (N)

Month June Day 15 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Findley Creek Station Number: 1

Station Location - **T** 21 **N, R** 10 (circle one) (E) or **W** , **S** 6 , **QQ (1/16)** SW , **of Q (1/4)** NE

UTM zone: 10 E (x) coordinate: 606326 N (y) coordinate: 5243160 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Corey McGrinnell Initials: CMG Affiliation: ABR, Inc. Phone: (541) 359-7525

Station Elevation: 958 **Ft** / (M) Position on Slope (circle one): **Bottom/plain, Lower 1/3,** (Mid 1/3,) **Upper 1/3, Ridgetop**

Station Placement (circle one): **Inside,** (Outside)

Distance from Survey Site Boundary: 20 Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): (1 = 0 to 25%,) **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

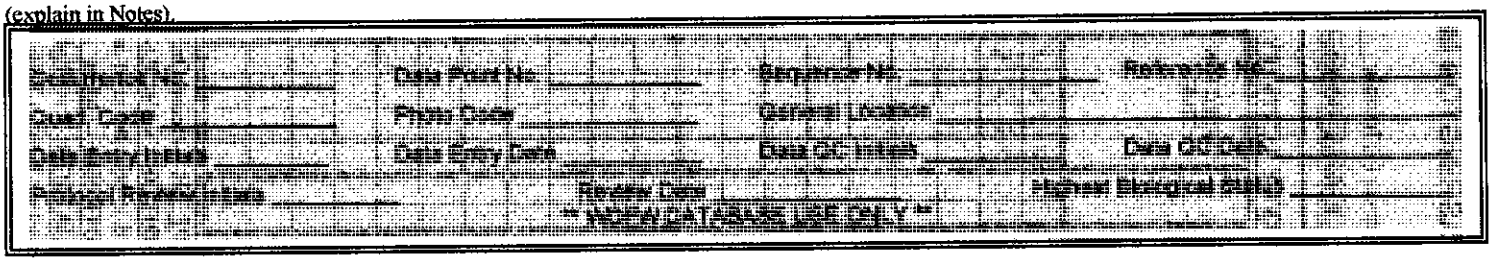
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0628

Temperature at Sunrise: 7 ° Temperature at End of Survey: 7 ° (circle one) (C) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	HI	3	Y	Y	Y	L	N	N	0	N	Begin Survey
0433	HI	3	N	Y	Y	M	N	N	0	N	rain impairs vertical vis
0442	HI	3	N	Y	N	H	N	N	0	P	heavy rain impairs hearing
0505	HI	3	Y	Y	Y	L	N	N	0	N	rain no longer impairs
0518	HI	3	Y	Y	Y	M	N	N	0	N	moderate rain
0524	HI	3	N	Y	N	H	N	N	0	P	heavy rain impairing
0534	LO	3	N	N	N	H	Y	N	0	P	fog rolls in
0544	HI	3	Y	Y	Y	M	N	N	0	N	fog clears / rain decreases
0603	HI	3	Y	Y	Y	L	N	N	0	N	light rain
0628	HI	3	N	Y	N	H	N	N	0	P	heavy rain impairing

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: CMG

Month June Day 15 Year 2007 Site Name / No: Sindley Creek

Data Reference Number: 2 0 -

Units of Measure (circle one): U.S. / (Metric) Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	VOCAL SERIES End	VOCAL SERIES #	VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (meters) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0 4 2 4	—														Begin Survey
	1	0 6 2 8	—														End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): N CAL

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 15 Year 2007

Area Name: Cedar Creek Watershed Site Name / Number: Lindsay Creek Station Number: 1

Station Location - T 21 N, R 9 (circle one) (E) or W, S 4, QQ (1/16) SE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 601172 N (y) coordinate: 5243187 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Neil Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 871 Ft / (M) Position on Slope (circle one): **Bottom/plain**, **Lower 1/3**, (**Mid 1/3**), **Upper 1/3**, **Ridgetop**

Station Placement (circle one): (**Inside**), **Outside**

Distance from Survey Site Boundary: NA Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): **1** = 0 to 25%, (**2** = 26 to 50%), **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** North Bend **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 8.5 ° Temperature at End of Survey: 11.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	HI	3	Y	Y	N	H	N	N	1	T,C	Begin Survey
0441	HI	3	Y	Y	N	H	N	N	1	T,C,B	
0501	HI	3	Y	Y	Y	L	N	N	1	T,C,B,A	
0509	HI	3	Y	Y	Y	L	N	N	1	T,C,B,A	Sunrise
0515	HI	3	Y	Y	N	H	N	N	1	T,C,B,A	
0547	HI	3	Y	Y	Y	L	N	N	1	T,C,B,A	
0607	HI	3	Y	Y	Y	M	N	N	1	T,C,B,A	
0624	HI	3	Y	Y	Y	L	N	N	1	T,C,B,A	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

[illegible] No. ______ Date Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Date QC Date ______
[illegible] Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0
Area Name: Cedar Creek Watershed

Observer (s) Initials: NEJ
Data Reference Number:
Month 06 Day 15 Year 2007
Units of Measure (circle one): U.S. / (Metric)
Site Name / No: Lindsey Creek
Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES (Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint))
	—	0424															Begin Survey
	—	0445															1st WIWR
	—	0447															1st AMRO
	—	0449															1st WRTI
	—	0459															1st DUGR
	—	0509															Sunrise
	—	0512															1st CBCH
	—	0515															1st SPTO
	—	0548															1st RECR
	—	0555															1st HAWO
	—	0601															1st GRJA
	—	0624															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.
AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).
AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.
BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month June Day 15 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Rock Creek Station Number: 2

Station Location - T 22 N, R 8 (circle one) (E) or W, S 24, QQ (1/16) NW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 596 282 N (y) coordinate: 5248 774 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc Phone: (503) 359-7525

Station Elevation: 914 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: - Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): **1** = 0 to 25%, **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table**: North Bend **Begin Survey** Time: 0421 **End Survey** Time: 0628

Temperature at Sunrise: 7.5 ° Temperature at End of Survey: 7.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0421	HI	3	Y	Y	Y	L	N	N	0	N	Begin Survey
0509	HI	3	Y	Y	Y	L	N	N	1	N	Sunrise
0517	HI	3	Y	Y	Y	M	N	N	1	N	
0524	HI	3	N	Y	N	H	N	N	1	N	
0527	HI	3	Y	Y	Y	M	N	N	1	N	
0531	HI	3	Y	Y	Y	L	N	N	1	N	
0628	HI	3	Y	Y	Y	L	N	N	1	N	End survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

For office use only

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month June Day 15 Year 2007

Site Name / No: Rock Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES (Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint))
	/	0421															Begin Survey
	/	0427															♀ Strix sp. (Hybrid?)
	/	0435															Strix sp. Juvy's
	/	0502															Steller Jays
	/	0528															♂ Barred owl
	/	0530															Common Raven
	/	0601															Loon
	/	0628															End survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Species of Concern: Common Loon

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CW

Total Detections: 0

Species of Concern (circle one, details on last pg.): **Y** or **N**

Month 06 Day 19 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lindsey Creek Station Number: 1

Station Location - **T** _____ **N, R** _____ (circle one) **E** or **W** , **S** _____, **QQ (1/16)** _____, **of Q (1/4)** _____

UTM zone: 10 E (x) coordinate: _____ N (y) coordinate: _____ Source: _____ Datum: _____ FOM: _____

Observer (s) Name: Neil Jensen Initials: NEJ Affiliation: ARR, Inc Phone: (503) 359-7525

Station Elevation: _____ **Ft / M** Position on Slope (circle one): **Bottom/plain, Lower 1/3, Mid 1/3, Upper 1/3, Ridgetop**

Station Placement (circle one): (Inside) **Outside**

Distance from Survey Site Boundary: NA Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): ~~1 = 0 to 25%~~ **2** = 26 to 50% **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0509 **Table:** US Navy **Begin Survey** Time: 0424 **End Survey** Time: 0624

Temperature at Sunrise: 5.5 ° Temperature at End of Survey: 7.0 ° (circle one) (C) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0424	UL	0	Y	Y	Y	N	N	N	1	B,C	Begin Survey
0509	UL	0	Y	Y	Y	N	N	N	1	B,C	Sunrise
0606	HI	2	Y	Y	Y	N	N	N	1	B,C	very high clouds
0624	HI	2	Y	Y	Y	N	N	N	1	B,C,A	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0
Area Name: Cedar Creek Watershed
Pg. 2 of 2

Observer (s) Initials: NEJ
Data Reference Number:
Month 06 Day 19 Year 2007
Units of Measure (circle one): U.S. / (Metric)
Site Name / No: Lindsey Creek
Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (m) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	0	0424															Begin Survey
		0424															1st VATH
		0431															1st WIWR
		0434															1st CONI
		0436															1st WRTT
		0441															1st DUGR
		0448															1st GRJA
		0452															1st SPTO
		0454															1st RBNU
		0504															1st HAWO
		0509															Sunrise
		0514															1st RECR, 1st PSFL
		0519															1st AMRO
		0521															1st CBCH
		0531															1st STJA
		0614															1st RTPI
		0624															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | Cnl

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 20 Year 2007

Area Name: Cedar Creek Watershed Site Name / Number: Findley Creek Station Number: 1

Station Location - T 21 N, R 10 (circle one) (E) or W , S 6 , QQ (1/16) SW , of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 606326 N (y) coordinate: 5243160 Source: GPS Datum: NAD 83 FOM: –

Observer (s) Name: Neil Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 958 Ft (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): Inside, (Outside)

Distance from Survey Site Boundary: 20 Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): (1 = 0 to 25%), 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table:** North Bend **Begin Survey** Time: 0425 **End Survey** Time: 0625

Temperature at Sunrise: 4.5 ° Temperature at End of Survey: ____ ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0425	UL	0	Y	Y	Y	N	N	N	2	B,C	Begin Survey
0510	UL	0	Y	Y	Y	N	N	N	2	B,C,A	Sunrise
0625	UL	0	Y	Y	Y	N	N	N	2	B,C,A	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

[illegible] No. ____ Data Point No. ____ Sequence No. ____ Reference No. ____
Quad. Code ____ Photo Code ____ General Location ____
Data Entry Initials ____ Data Entry Date ____ Data QC Initials ____ Date QC Date ____
[illegible] Review Initials ____ Review Date ____ Highest Biological Status ____
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar Creek Watershed

Observer (s) Initials: NEJ

Month 06 Day 20 Year 2007

Site Name / No: Finley Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0425															Begin Survey, 1st OSFL,
		0425															1st CONI, 1st VATH,
		0425															1st SWTH, 1st WIWR,
		0425															1st HETH
		0428															1st CBCH, 1st WIFL
		0505															1st WRTI
		0549															Sunrise
		0516															1st RUHU
		0519															1st STJA
		0521															1st VASW
		0522															1st HAWO
		0556															1st NOFL
		0625															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMB

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Area Name: Cedar River Watershed Site Name / Number: South Fork Cedar River Northeast Month June Day 20 Year 2007 Station Number: 1

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) NW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 611924 N (y) coordinate: 5241408 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc Phone: (503) 359-7525

Station Elevation: 801 Ft / (M) Position on Slope (circle one): Bottom/plain, (Lower 1/3,) Mid 1/3, Upper 1/3, Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

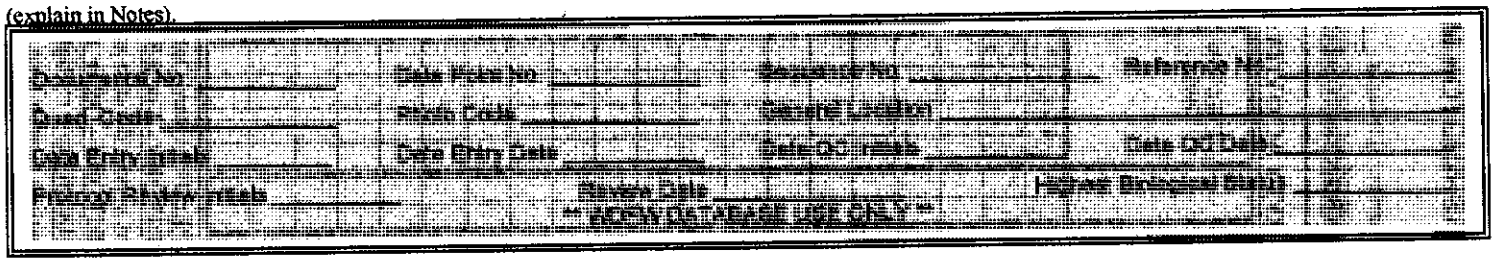
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table:** North Bend **Begin Survey** Time: 0422 **End Survey** Time: 0625

Temperature at Sunrise: 10.0 ° Temperature at End of Survey: 10.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0422	UL	0	Y	Y	Y	N	N	N	1	N	Begin Survey
0510	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0625	UL	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month June Day 20 Year 2007

Site Name / No: South Fork Cedar River

Data Reference Number: [illegible]

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	/	0422															Begin Survey
	/	0625															End Survey

TYPE: H = Heard Only (no visual), S = Seen Only (silent), B = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): K = KEER calls, G = Groan (alternate) calls, O = Whistle or Soft Que calls, U = Unknown, — = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard 1-5 or M = Multiple. OL = Overlapping Vocalizations (Y or N).

AUDITORY - Other (Non-Vocal Sounds): W = Wing Sound, J = Jet Sound, — = None or N/A. If both are heard write W / J.

BEHAVIOR: F = Flight Over Canopy, C = Circle Over Canopy, T = Fly-Through At or Below Canopy (≤ 1.0), B = Circle At or Below Canopy (≤ 1.0), L = Seen Landing in or Departing From a Tree, S = Stationary Calling (fixed-point multiple calls <100 m), U = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CM

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 21 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Chester North Station Number: 2

Station Location - T 22 N, R 9 (circle one) (E) or W, S 16, **QQ (1/16)** SE, **of Q (1/4)** NE

UTM zone: 10 E (x) coordinate: 601264 N (y) coordinate: 5249531 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 977 Ft / (M) Position on Slope (circle one): **Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop**

Station Placement (circle one): (Inside) **Outside**

Distance from Survey Site Boundary: —— Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, **2** = 26 to 50%, **3** = 51 to 75% (**4** = 76 to 100%)

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table:** North Bend **Begin Survey** Time: 0425 **End Survey** Time: 0625

Temperature at Sunrise: 8.5 ° Temperature at End of Survey: 8.0 ° (circle one) (C) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0425	HI	3	Y	Y	Y	L	N	N	1	N	Begin Survey
0440	HI	3	Y	Y	Y	N	N	N	1	N	
0510	HI	3	Y	Y	Y	N	N	N	1	N	Sunrise
0559	HI	2	Y	Y	Y	N	N	N	1	N	
0611	HI	1	Y	Y	Y	N	N	N	2	N	
0625	HI	1	Y	Y	Y	N	N	N	2	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Document No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River Watershed

Month June Day 21 Year 2007

Site Name / No: Chester North

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES (Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0425															Begin Survey
	2	0625															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): N | CMt

Total Detections: Ø

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 22 Year 2007

Area Name: Cedar River Watershed Site Name / Number: 155.1A Station Number: 1

Station Location - T 22 N, R 10 (circle one) (E) or W, S 30, QQ (1/16) NW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 607495 N (y) coordinate: 5245965 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: 503 359-7525

Station Elevation: 894 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%,) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table** North Bend **Begin Survey** Time: 0425 **End Survey** Time: 0655

Temperature at Sunrise: 9 ° Temperature at End of Survey: 9.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0425	HI	3	Y	Y	Y	L	N	N	1	N	Begin Survey
0448	MID	3	N	Y	Y	L	N	N	1	N	
0452	LO	3	N	Y	Y	L	L	N	1	N	Distant fog
0456	LO	3	N	N	Y	L	L	N	1	N	
0510	MID	3	N	Y	Y	L	N	N	2	N	Sunrise
0625	HI	3	Y	Y	Y	N	N	N	1	N	
0655	HI	3	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Occurrence No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Resource Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Month June Day 22 Year 2007

Area Name: Cedar River Watershed

Site Name / No: 155.1A

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number:

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY					# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
					VOCAL SERIES				OTHER								
					Start	End	#	OL	W / J								
	/	0425															Begin survey
	/	0655															End survey
																	(Extended 30 min due to weather)

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), L = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), U = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CMH

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 21 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lost Creek Station Number: 1

Station Location - T 22 N R 8 (circle one) (E) or W , S 11 , QQ (1/16) SW , of Q (1/4) SW

UTM zone: 10 E (x) coordinate: 594882 N (y) coordinate: 5250301 Source: GPS Datum: NAD83 FOM: –

Observer (s) Name: Neil Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 739 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: 0m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%), 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0510 **Table:** North Bend, WA **Begin Survey** Time: 0425 **End Survey** Time: 625

Temperature at Sunrise: 12.5 ° Temperature at End of Survey: 14.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0425	HI	3	Y	Y	Y	L	N	N	0	N	Begin Survey, drizzle
0428	HI	3	Y	Y	Y	N	N	N	0	N	
0440	HI	3	Y	Y	Y	N	N	N	0	N	
0508	HI	3	Y	Y	Y	N	N	N	1	N	
0510	HI	3	Y	Y	Y	N	N	N	1	N	Sunrise
0530	HI	2	Y	Y	Y	N	N	N	1	N	
0537	HI	1	Y	Y	Y	N	N	N	1	N	
0544	HI	0	Y	Y	Y	N	N	N	1	N	
0625	HI	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

[illegible] No. ____ Data Form No. ____ [illegible] No. ____ [illegible] No. ____
[illegible] ____ [illegible] ____ General Location ____
Data Entry Initials ____ Data Entry Date ____ [illegible] ____ [illegible] Date ____
[illegible] ____ Review Date ____ [illegible] ____
** AGENCY DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 | Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 06 Day 21 Year 2007

Site Name / No: Last Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0425															Begin Survey
	2	0428															1st VATH
	3	0432															1st WIWR
	4	0505															1st STJA
	5	0510															Sunrise
	6	0521															1st PSFL
	7	0524															1st DEJU
	8	0528															1st SWTH
	9	0530															1st RBPI
	10	0549															1st NOFL
	11	0601															1st RCCH
	12	0622															1st RECR, unk. accipiter
	13	0625															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y Cnt

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 22 Year 2007

Area Name: Cedar River Watershed Site Name / Number: South Fork Cedar River North Station Number: 3

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) SE, of Q (1/4) NW

UTM zone: 10 E (x) coordinate: 611251 N (y) coordinate: 5242146 Source: GPS Datum: NAD83 FOM: –

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 728 Ft / (M) Position on Slope (circle one): Bottom/plain, (Lower 1/3,) Mid 1/3, Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: 0 m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official Sunrise Time: 510 Table: North Bend, WA **Begin Survey** Time: 425 **End Survey** Time: 625

Temperature at Sunrise: 8.5 ° Temperature at End of Survey: 10.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	FOG	OTHER	WIND	NOISE	NOTES
0425	HI	3	Y	Y	Y	N	L	N	1	N	Begin Survey
0438	HI	3	Y	Y	Y	L	L	N	1	N	light drizzle (could see CONT 200m)
0441	HI	3	Y	Y	Y	N	L	N	1	N	drizzle stopped
0452	HI	3	Y	Y	Y	N	N	N	1	N	fog lifted "
0510	HI	3	Y	Y	Y	N	N	N	1	N	Sunrise
0551	HI	3	Y	Y	Y	N	N	N	2	N	
0607	HI	3	Y	Y	Y	N	N	N	0	N	
0625	HI	3	Y	Y	Y	N	N	N	0	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other: H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: N = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. ____ Data Point No. ____ Sequence No. ____ Reference No. ____
Quad Code ____ Photo Code ____ General Locality ____
Data Entry Initials ____ Data Entry Date ____ Data QC Initials ____ Data QC Date ____
Protocol Review Initials ____ Review Date ____ Highest Biological Status ____
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 06 Day 22 Year 2007

Site Name / No: South Fork Ceda R.'s North

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 3

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY					# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
					VOCAL SERIES				OTHER								
					Start	End	#	OL	W / J								
	—	0425	—														Begin Survey
	—	0425	—														1st SWTH, 1st COVE
	—	0425	—														1st RUHU
	—	0428	—														1st VATH
	—	0431	—														1st OSFL
	—	0444	—														1st WIWR
	—	0445	—														1st AMRO
	—	0451	—														1st WCSP
	—	0510	—														Sunrise
	—	0514	—														1st PSFL
	—	0523	—														1st RBNU
	—	0526	—														1st STJA
	—	0548	—														1st CBCH
	—	0611	—														1st SPTO
	—	0625	—														End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CNL

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 06 Day 25 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Rock Creek Station Number: 2

Station Location - T 22 N, R 8 (circle one) (E) or W, S 24, QQ (1/16) NW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 596282 N (y) coordinate: 5248774 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ARR, Inc Phone: (503) 359-7525

Station Elevation: 914 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: 0 m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): (1 = 0 to 25%) 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0511 **Table:** North Bend, WA **Begin Survey** Time: 0425 **End Survey** Time: 0626

Temperature at Sunrise: 6.5 ° Temperature at End of Survey: 8.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0426	UL	0	Y	Y	Y	N	N	N	2	N	Begin Survey
0428	UL	0	Y	Y	Y	N	N	N	2	N	
0511	UL	0	Y	Y	Y	N	N	N	2	N	Sunrise
0515	UL	0	Y	Y	Y	N	N	N	2	N.	wind gusts to 3

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Document No. ____ Data Proof No. ____ Sequence No. ____ Reference No. ____
Quad Code ____ Photo Code ____ General Location ____
Data Entry Initials ____ Data Entry Date ____ Data QC Initials ____ Data QC Date ____
Protocol Review Initials ____ Review Date ____ Highest Biological Status ____
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 06 Day 25 Year 2007

Site Name / No: Rock Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number:

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0426															Begin Survey
		0428															1st VATH
		0429															1st HETH
		0432															1st WIWR
		0433															1st COLO
		0436															1st SWTH
		0438															1st DEJU
		0446															1st BAEA
		0456															1st RUHU
		0459															1st RECR
		0511															Sunrise
		0524															1st HAWO
		0525															1st CORA
		0536															1st CRCH
		0553															1st RBNU
		0626															End Survey

TYPE: H = Heard Only (no visual), S = Seen Only (silent), B = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): K = KEER calls, G = Groan (alternate) calls, O = Whistle or Soft Que calls, U = Unknown, — = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard 1-5 or M = Multiple. OL = Overlapping Vocalizations (Y or N).

AUDITORY - Other (Non-Vocal Sounds): W = Wing Sound, J = Jet Sound, — = None or N/A. If both are heard write W / J.

BEHAVIOR: F = Flight Over Canopy, C = Circle Over Canopy, T = Fly-Through At or Below Canopy (≤ 1.0), B = Circle At or Below Canopy (≤ 1.0), L = Seen Landing in or Departing From a Tree, S = Stationary Calling (fixed-point multiple calls <100 m), U = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Species of Concern BAEA, COLO

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMH

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 27 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Taylor Ridge Station Number: 1

Station Location - T 22 N, R 8 (circle one) (E) or W, S 26, QQ (1/16) NW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 594828 N (y) coordinate: 5247069 Source: GPS Datum: NAD 83 FOM: -

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 1053 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, Mid 1/3, (Upper 1/3,) Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%,) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0512 Table: North Bend, WA **Begin Survey** Time: 0426 **End Survey** Time: 0627

Temperature at Sunrise: 13.0 ° Temperature at End of Survey: 15.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0426	UL	0	Y	Y	Y	N	N	N	0	N	Begin Survey
0443	UL	0	Y	Y	Y	N	N	N	0	N	
0448	HI	1	Y	Y	Y	N	N	N	0	N	very high cloud cover
0512	UL	1	Y	Y	Y	N	N	N	0	N	Sunrise
0531	UL	1	Y	Y	Y	N	N	N	1	N	
0549	HI	3	Y	Y	Y	N	N	N	1	N	
0627	HI	3	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Occurrence No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Regional Biologist Initials ______
-- WDFW DATABASE USE ONLY --

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 06 Day 27 Year 2007

Site Name / No: Taylor Ridge

Data Reference Number: S 2 3 4

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	—	0426	—														Begin Survey, 1st VATH
	—	0426	—														1st ANRO, 1st DEJU
	—	0434	—														1st WIWR
	—	0448	—														1st BCCH
	—	0456	—														1st Unknown (Visual) Bat Species
	—	0501	—														1st RECR
	—	0503	—														1st PSFL
	—	0512	—														Sunrise, 1st RBNU
	—	0515	—														1st HAWO
	—	0525	—														1st SWTH
	—	0621	—														1st GRJA
	—	0627	—														End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMH

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 28 Year 2007

Area Name: Cedar River Watershed Site Name / Number: 155.1A Station Number: 1

Station Location - T 22 N, R 10 (circle one) (E) or W, S 30, QQ (1/16) NE, of Q (1/4) SW

UTM zone: 10 E (x) coordinate: 607495 N (y) coordinate: 5245965 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (509) 359-7525

Station Elevation: 894 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, Mid 1/3, (Upper 1/3), Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: 0 m Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%), 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0512 **Table:** North Bend **Begin Survey** Time: 0427 **End Survey** Time: 0657

Temperature at Sunrise: 11.5 ° Temperature at End of Survey: 12.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0427	HI	3	Y	Y	Y	N	N	N	1	N	Begin Survey
0452	HI	3	Y	Y	Y	N	N	N	2	N	
0512	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0607	HI	3	Y	Y	Y	L	N	N	0	N	
0657	HI	3	Y	Y	Y	L	N	N	0	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month June Day 28 Year 2007

Site Name / No: 155.1A

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	✓	0427															Begin Survey
	✓	0657															End Survey
																	Note: Extended survey 1/2 hour due to clouds and light rain.

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **---** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CMH

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 28 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lindsey Creek Station Number: 2

Station Location - T 21 N, R 9 (circle one) (E) or W, S 4, QQ (1/16) SW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 601032 N (y) coordinate: 5243132 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 826 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0512 Table: North Bend, WA **Begin Survey** Time: 0427 **End Survey** Time: 0627

Temperature at Sunrise: 14.5 ° Temperature at End of Survey: 16.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0427	HI	3	Y	Y	Y	N	N	N	1	N	Begin Survey
0442	HI	3	Y	Y	Y	N	N	N	1	N	
0512	HI	3	Y	Y	Y	N	N	N	1	N	Sunrise
0550	HI	3	Y	Y	Y	L	N	N	1	N	
0558	HI	3	Y	Y	Y	N	N	N	1	N	
0627	HI	3	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other: H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: N = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Document No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 | Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 06 Day 28 Year 2007

Site Name / No: Lindsey Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FUGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	—	0427	—	—									•			—	Begin Survey, 1st CONT
	—	0427	—	—									•			—	1st VATH
	—	0438	—	—									•			—	1st DEJU
	—	0442	—	—									•			—	Vis. on unknown Rat Sp.
	—	0446	—	—									•			—	1st WIWR
	—	0449	—	—									•			—	1st HETH
	—	0505	—	—									•			—	1st GRJA
	—	0510	—	—									•			—	1st STJA
	—	0512	—	—									•			—	Sunrise
	—	0536	—	—									•			—	1st RBNU
	—	0539	—	—									•			—	1st RECR
	—	0541	—	—									•			—	1st AMRO
	—	0543	—	—									•			—	1st DUGR, 1st PSFL
	—	0546	—	—									•			—	1st VASW
	—	0549	—	—									•			—	1st HAWO
	—	0550	—	—									•			—	1st BCCH
	—	0627	—	—									•			—	End Survey
													•				
													•				
													•				

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMW

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 06 Day 29 Year 2007

Area Name: Cedar River Watershed Site Name / Number: S Fk. Cedar River NE Station Number: 1

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 611924 N (y) coordinate: 5241408 Source: GPS Datum: NAD83 FOM: –

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 801 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%) 3 = 51 to 75% 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official Sunrise Time: 0512 Table: North Bend, WA Begin Survey Time: 0427 End Survey Time: 0627

Temperature at Sunrise: 12.0 ° Temperature at End of Survey: 14.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0427	HI	3	Y	Y	Y	N	L	N	1	N	Begin Survey
0445	HI	3	Y	Y	Y	N	N	N	0	N	
0512	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0520	HI	3	Y	Y	Y	N	N	N	1	N	
0530	HI	2	Y	Y	Y	N	N	N	1	N	
0548	HI	3	Y	Y	Y	N	N	N	1	N	
0615	HI	3	Y	Y	Y	N	L	N	1	N	very light fog, tree drip, lt. drizzle
0627	HI	3	Y	Y	Y	N	L	N	1	N	End Survey

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

[illegible] No. ______ [illegible] No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Process Review Initials ______ Review Date ______ Highest Biological Status ______
** FOR DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 | Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 06 Day 29 Year 2007

Site Name / No: S Fk Cedar River NE

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	—	0427	—														Begin Survey, 1st COVE
	—	0434	—														1st HETH, 1st VATH
	—	0436	—														1st OSFL
	—	0436	—														1st AMRO, vis on COVE
	—	0448	—														1st SWTH
	—	0449	—														1st WIWR
	—	0451	—														1st DEJU
	—	0518	—														1st RTPI
	—	0530	—														1st HAWO
	—	0612	—														1st RUHU
	—	0618	—														1st CBCH
	—	0621	—														1st PSFL
	—	0627	—														End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CMG

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 29 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lost creek Station Number: 1

Station Location - T 22 N, R 8 (circle one) (E) or W , S 11 , QQ (1/16) SW , of Q (1/4) SW

UTM zone: 10 E (x) coordinate: 594882 N (y) coordinate: 5250301 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 739 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: 0 m Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%), 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0513 **Table:** North Bend **Begin Survey** Time: 0428 **End Survey** Time: 0628

Temperature at Sunrise: 10.5 ° Temperature at End of Survey: 10.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0428	MID	3	Y	Y	Y	N	L	N	0	N	Begin survey
0513	HI	2	Y	Y	Y	N	L	N	1	N	Sunrise
0517	HI	2	Y	Y	Y	N	N	N	1	N	
0527	MID	2	Y	Y	Y	N	L	N	1	N	
0546	HI	2	Y	Y	Y	N	N	N	1	N	
0628	HI	2	Y	Y	Y	N	N	N	1	N	End survey
											Note: MID ceiling
											was @ 2 canopies;
											never below.

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Occurrence No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month June Day 29 Year 2007

Site Name / No: Lost creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	/	0428															Begin Survey
	/	0628															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), L = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Predator: Stellers Jay

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): [N] [CAL]

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month June Day 30 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Findley Creek Station Number: 1

Station Location - T 21 N, R 10 (circle one) (E) or W, S 6, QQ (1/16) SW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 606326 N (y) coordinate: 5243160 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 958 Ft (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3) Upper 1/3, Ridgetop

Station Placement (circle one): Inside, (Outside)

Distance from Survey Site Boundary: 20 Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): (1 = 0 to 25%) 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0513 Table: North Bend **Begin Survey** Time: 0428 **End Survey** Time: 0628

Temperature at Sunrise: 9.5 ° Temperature at End of Survey: 10.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0428	LO	3	N	N	Y	N	M	N	0	N	Begin Survey
0502	HI	2	Y	Y	Y	N	L	N	0	N	
0513	HI	1	Y	Y	Y	N	N	N	1	N	Sunrise
0628	HI	1	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River Watershed

Month June Day 30 Year 2007

Site Name / No: Findley Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0428															Begin Survey
	1	0628															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 07 Day 06 Year 2007

Area Name: Cedar River Watershed Site Name / Number: 155.1A Station Number: 1

Station Location - T 22 N, R 10 (circle one) (E) or W, S 30, QQ (1/16) NW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 607495 N (y) coordinate: 5245965 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 894 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, Mid 1/3, (Upper 1/3,) Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

ENVIRONMENTAL CONDITIONS:

Official Sunrise Time: 517 Table: North Bend, WA Begin Survey Time: 0432 End Survey Time: 0632

Temperature at Sunrise: 10.0 ° Temperature at End of Survey: 12.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0432	UL	0	Y	Y	Y	N	N	N	0	N	Begin Survey
0510	UL	0	Y	Y	Y	N	N	N	1	N	
0517	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0632	Ul	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Database Record No. Data Sheet No. Sequence No. Reference No.
Quad Code Photo Code Sample Location
Data Entry Initials Data Entry Date Data QC Initials Data QC Date
Protocol Review Initials Review Date Highest Biological Status
** FOR DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 07 Day 06 Year 2007

Site Name / No: 155.1A

Data Reference Number:

Units of Measure (circle one): U.S. (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0432															Begin Survey, 1st COHA
		0432															1st WATH, 1st SWTH
		0436															1st OSFL
		0444															1st WIWR
		0451															1st DUGR
		0457															1st RBNU
		0517															Sunrise, 1st HAWO
		0532															1st DEJU
		0558															1st RCCH
		0632															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 07 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Findley Creek Station Number: 1

Station Location - T 21 N, R 9 (circle one) (E) or W, S 6, QQ (1/16) SW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 606326 N (y) coordinate: 5243160 Source: GPS Datum: NAD 83 FOM: -

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 958 Ft / (M) Position on Slope (circle one): **Bottom/plain**, **Lower 1/3**, (**Mid 1/3**), **Upper 1/3**, **Ridgetop**

Station Placement (circle one): **Inside**, (**Outside**)

Distance from Survey Site Boundary: 20m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): (**1** = 0 to 25%), **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0518 **Table:** North Bend, WA **Begin Survey** Time: 0433 **End Survey** Time: 0633

Temperature at Sunrise: 9.5 ° Temperature at End of Survey: 11.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0433	UL	0	Y	Y	Y	N	N	N	0	N	Begin Survey
0444	UL	0	Y	Y	Y	N	N	N	1	N	
0518	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0524	UL	0	Y	Y	Y	N	N	N	1	N	
0633	UL	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Detection No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Place Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Priority Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 07 Day 07 Year 07

Site Name / No: Findley Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0433															Begin Survey, 1st OSFL
		0433															1st SWTH, 1st HETH
		0433															1st VATH, 1st WIWR
		0442															1st BCCH
		0453															1st WIWA
		0508															1st DEJU
		0518															Sunrise
		0523															1st VASW
		0526															1st STJA
		0536															1st WIFL
		0548															1st PIWO
		0551															1st RUHU
		0557															1st DUGR
		0559															1st CORA
		0633															End Survey

TYPE: **H** = Heard Only (no visual), S = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, — = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, — = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Species of Concern: Bilated Woodpecker

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y Crh

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 08 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Chester North Station Number: 1

Station Location - T 22 N, R 9 (circle one) (E) or W, S 16, QQ (1/16) NE, of Q (1/4) SW

UTM zone: 10 E (x) coordinate: 600811 N (y) coordinate: 5249252 Source: GPS Datum: NAD83 FOM: -

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 723 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0519 **Table:** North Bend, WA **Begin Survey** Time: 0434 **End Survey** Time: 0634

Temperature at Sunrise: 11.0 ° Temperature at End of Survey: 13.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	FOG	OTHER	WIND	NOISE	NOTES
0434	HI	3	Y	Y	Y	N	N	N	0	N	Begin Survey, High Fog
0438	HI	3	Y	Y	Y	N	N	N	0	N	
0507	HI	3	Y	Y	Y	N	N	N	1	N	
0519	HI	3	Y	Y	Y	N	N	N	2	N	Sunrise
0544	HI	2	Y	Y	Y	N	N	N	2	N	
0550	HI	2	Y	Y	Y	N	N	N	2	N	
0634	HI	2	Y	Y	Y	N	N	N	2	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Document No. ____ Data Form No. ____ Sequence No. ____ Reference No. ____
Quad Code ____ Photo Code ____ Sampled Location ____
Data Entry Initials ____ Data Entry Date ____ Data QC Initials ____ Data QC Date ____
Protocol Review Initials ____ Review Date ____ Highest Biological Status ____
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 07 Day 08 Year 2007

Site Name / No: Chester North

Data Reference Number:

Units of Measure (circle one): U.S. (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0434															Begin Survey
		0438															1st PVATH
		0439															1st PSFL
		0442															1st AMRO
		0446															1st CBCH, 1st DEJU
		0455															visual on unk. bat species
		0459															1st RBNU
		0502															1st WIWR
		0519															Sunrise
		0526															1st COLO
		0532															1st STJA
		0541															1st HAWO
		0610															1st RTPI
		0634															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Species of Concern: Common Loon

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CMK

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 07 Day 09 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lost Creek Station Number: 3

Station Location - T 22 N, R 8 (circle one) (E) or W, S 11, QQ (1/16) SW, of Q (1/4) SW

UTM zone: 10 E (x) coordinate: 600811 N (y) coordinate: 5249252 Source: GPS Datum: NAD83 FOM: –

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc Phone: (503) 359-7525

Station Elevation: 737 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: 0m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%), 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0520 Table: North Bend, WA **Begin Survey** Time: 0435 **End Survey Time:** 0635

Temperature at Sunrise: 13.5 ° Temperature at End of Survey: 15.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	FOG	OTHER	WIND	NOISE	NOTES
0435	UL	0	Y	Y	Y	N	N	N	1	N	Begin Survey
0456	UL	0	Y	Y	Y	N	N	N	2	N	
0518	UL	0	Y	Y	Y	N	N	N	1	N	
0520	UL	0	Y	Y	Y	N	N	N	0	N	Sunrise
0532	UL	0	Y	Y	Y	N	N	N	1	N	
0534	UL	0	Y	Y	Y	N	N	N	2	N	
0624	UL	0	Y	Y	Y	N	N	N	2	N	gusts to 3
0635	UL	0	Y	Y	Y	N	N	N	2	N	End Survey, gusts to 3

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

Document No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Highest Biological Status ______
— WDFW DATABASE USE ONLY —

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0
Area Name: Cedar River Watershed
Pg. 2 of 2

Observer (s) Initials: NEJ
Month 07 Day 09 Year 2007
Site Name / No: Lost Creek
Data Reference Number:
Units of Measure (circle one): U.S. / (Metric)
Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0435															Begin Survey, 1st VATH
	2	0441															1st WIWR
	3	0445															1st DEJU
	4	0446															1st AMRO
	5	0502															1st WIWA
	6	0506															1st CBCH
	7	0510															1st RECR
	8	0516															1st STJA
	9	0520															Sunrise
	10	0551															1st PSFL
	11	0610															1st NOFL
	12	0635															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CmL

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month July Day 09 Year 2007

Area Name: Cedar River Watershed Site Name / Number: South Fork Cedar River North Station Number: 1

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) NW, of Q (1/4) NW

UTM zone: 10 E (x) coordinate: 611067 N (y) coordinate: 5242333 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc Phone: (503) 359-7525

Station Elevation: 659 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: 0 m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%,) 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0520 Table: North Bend **Begin Survey** Time: 0435 **End Survey** Time: 0635

Temperature at Sunrise: 11.5 ° Temperature at End of Survey: 12.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0435	HI	3	Y	Y	Y	N	N	N	1	N	Begin survey
0520	HI	3	Y	Y	Y	N	N	N	1	N	sunrise
0635	HI	3	Y	Y	Y	N	N	N	1	N	End survey

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other (explain in Notes).

[illegible] No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
[illegible] Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month July Day 09 Year 2007

Site Name / No: South Fork Cedar River North

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	/	0435															Begin Survey
	/	0635															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown. **(Check Reverse Side When Using 2-Sided Forms)**

Predators: Steller's Jay, Common Raven

Species of concern: Pileated Woodpecker

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CmB

Total Detections: 0

Species of Concern (circle one, details on last pg.): **Y** or (**N**)

Month July Day 10 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Findley Creek Station Number: 1

Station Location - **T** 21 **N, R** 10 (circle one) (**E**) or **W** , **S** 6 , **QQ (1/16)** SW , **of Q (1/4)** NE

UTM zone: 10 **E (x) coordinate:** 606326 **N (y) coordinate:** 5243160 **Source:** GPS **Datum:** NAD 83 **FOM:** —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 958 **Ft /** (**M**) Position on Slope (circle one): **Bottom/plain, Lower 1/3,** (**Mid 1/3,**) **Upper 1/3, Ridgetop**

Station Placement (circle one): **Inside,** (**Outside**)

Distance from Survey Site Boundary: 20 Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): (**1** = 0 to 25%,) **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0520 **Table:** North Bend **Begin Survey** Time: 0435 **End Survey** Time: 0635

Temperature at Sunrise: 12.5 ° Temperature at End of Survey: 13.0 ° (circle one) (**C**) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0435	UL	0	Y	Y	Y	N	N	N	1	N	Begin Survey
0520	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0635	UL	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month July Day 10 Year 2007

Site Name / No: Findley Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY				# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
					VOCAL SERIES											
					Start	End	#	OL	OTHER W / J							
	1	0435														Begin Survey
	1	0635														End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Predator: Steller's Jay

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): y [illegible]

Total Detections: 0

Species of Concern (circle one, details on last pg.): **Y** or (**N**)

Month 07 Day 10 Year 2007

Area Name: Cedar River Watershed Site Name / Number: South Fork Cedar River NE Station Number: 1

Station Location - **T** 21 **N, R** 10 (circle one) (**E**) or **W** , **S** 10 , **QQ (1/16)** NW , **of Q (1/4)** SE

UTM zone: 10 E (x) coordinate: 611924 N (y) coordinate: 5241408 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ARR, Inc. Phone: (503) 359-7525

Station Elevation: 801 **Ft** / (**M**) Position on Slope (circle one): **Bottom/plain** (**Lower 1/3**) **Mid 1/3**, **Upper 1/3**, **Ridgetop**

Station Placement (circle one) (**Inside**) **Outside**

Distance from Survey Site Boundary: 0m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): (**1** = 0 to 25%,) **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0520 **Table:** North Bend, WA **Begin Survey** Time: 0434 **End Survey** Time: 0635

Temperature at Sunrise: 17.0 ° Temperature at End of Survey: 20.5 ° (circle one) (**C**) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0434	UL	0	Y	Y	Y	N	N	N	1	N	Begin Survey
0520	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0635	UL	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad. Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2
Area Name: Cedar River Watershed

Observer (s) Initials: NEJ
Month 07 Day 10 Year 2007
Site Name / No: S Fk Cedar River NE

Data Reference Number:
Units of Measure (circle one): U.S. / (Metric)
Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0434															Begin Survey, 1st COVI
	2	0434															1st HETH, 1st VATH
	3	0434															1st DEJU, 1st AMRO
	4	0443															1st SWTH
	5	0457															1st WIWR
	6	0520															Sunrise
	7	0551															1st STJA
	8	0601															1st RUHU
	9	0604															1st NOFL
	10	0615															1st OSFL
	11	0624															1st RECR
	12	0629															1st BTPI
	13	0635															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write **W / J**.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Potential Predators: STJA

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | Cmh

Total Detections: Ø

Species of Concern (circle one, details on last pg.): Y or (N)

Month July Day 11 Year 2007

Area Name: Cedar River watershed Site Name / Number: Taylor Ridge Station Number: 1

Station Location - T 22N N, R 8E (circle one) (E) or W, S 26, QQ (1/16) NW, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 594828 N (y) coordinate: 5247069 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 1053 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, Mid 1/3, (Upper 1/3) Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0521 Table: North Bend **Begin Survey** Time: 0426 **End Survey** Time: 0636

Temperature at Sunrise: 22 ° Temperature at End of Survey: 22 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0426	UL	0	Y	Y	Y	N	N	N	1	N	Begin survey
0521	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0636	UL	0	Y	Y	Y	N	N	N	1	N	End survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad. Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month July Day 11 Year 2007

Site Name / No: Taylor Ridge

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0426															Begin Survey
	2	0636															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 11 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Rack Creek Station Number: 2

Station Location - T 22 N, R 8 (circle one) (E) or W, S 13, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 596282 N (y) coordinate: 5248774 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 914 Ft / (M) Position on Slope (circle one): **Bottom/plain, Lower 1/3, (Mid 1/3,) ~~Upper 1/3,~~ Ridgetop**

Station Placement (circle one): (**Inside**) **Outside**

Distance from Survey Site Boundary: 0m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): (**1** = 0 to 25%,) **2** = 26 to 50%, **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0521 **Table:** North Bend, WA **Begin Survey** Time: 0436 **End Survey** Time: 0636

Temperature at Sunrise: 21.5 ° Temperature at End of Survey: 24.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0436	UL	0	Y	Y	Y	N	N	N	1	N	Begin Survey
0521	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0636	UL	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Reference No. ____
General Location ____
Data Entry Date ____
Review Date ____
** WDFW DATABASE USE ONLY **

VASW

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0
Area Name: Cedar River Watershed

Observer (s) Initials: NEJ
Month 07 Day 11 Year 2007
Site Name / No: Rock Creek
Data Reference Number:
Units of Measure (circle one): U.S. / (Metric)
Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0436															Begin Survey, 1st HETH
		0436															1st VATH
		0448															1st DEJU, 1st OSFL
		0451															1st COLO
		0503															1st RBNU
		0504															1st WIWR
		0509															1st STJA
		0519															1st RECR
		0521															Sunrise
		0527															1st RUHU
		0534															1st VASW, 1st BTPI
		0631															1st Townsend's Chipmunk
		0636															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.
AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **---** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).
AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **---** = None or N/A. If both are heard write W / J.
BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.
(Check Reverse Side When Using 2-Sided Forms)

Species of Concern: VASW, COLO Potential Predators: Steller's Jay, Townsend Chipmunk

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAW

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 12 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lindsey Creek Station Number: 3

Station Location - T 21 N, R 9 (circle one) (E) or W, S 4, QQ (1/16) NW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 601178 N (y) coordinate: 5243286 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 849 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), ~~Upper 1/3~~, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): (1 = 0 to 25%), 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0522 **Table:** North Bend, WA **Begin Survey** Time: 0437 **End Survey** Time: 0637

Temperature at Sunrise: 14.0 ° Temperature at End of Survey: 15.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	FOG	OTHER	WIND	NOISE	NOTES
0437	UL	0	Y	Y	Y	N	N	N	1	N	Begin Survey
0443	UL	0	Y	Y	Y	N	N	N	2	N	
0522	UL	0	Y	Y	Y	N	N	N	1	N	Sunrise
0637	UL	0	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** H = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: N = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad. Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Protocol Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

VASW

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 | Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ | Month 07 Day 12 Year 2007 | Site Name / No: Lindsey Creek

Data Reference Number: | Units of Measure (circle one): U.S. / (Metric) | Station Number: 3

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	VOCAL SERIES End	VOCAL SERIES #	VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0437															Begin Survey, 1st VATH
		0437															1st CONI, 1st HETH
		0437															1st SWTH
		0443															1st WIWR
		0447															1st AMRO
		0453															1st NPOW
		0455															1st CBCH
		0505															1st DEJU, 1st RBNU
		0516															1st STJA
		0517															1st VASW
		0522															Sunrise
		0531															1st RBSA
		0555															1st HAWO

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **---** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **---** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Spois of concern: VASW Potential Predator: STJA

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | GL

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month July Day 12 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Chester North Station Number: 2

Station Location - T 22 N, R 9 (circle one) (E) or W, S 16, QQ (1/16) SE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 601264 N (y) coordinate: 5249531 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 977 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: —— Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%) 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0522 **Table:** North Bend **Begin Survey** Time: 0432 **End Survey** Time: 0637

Temperature at Sunrise: 16 ° Temperature at End of Survey: 16 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0432	UL	0	Y	Y	Y	N	N	N	0	N	Begin Survey
0522	UL	0	Y	Y	Y	N	N	N	0	N	Sunrise
0637	UL	0	Y	Y	Y	N	N	N	0	N	End survey

Ceiling: UL = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other: H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: N = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

[illegible] No. ______ Data [illegible] No. ______ [illegible] No. ______ [illegible] No. ______
[illegible] Code ______ Photo Code ______ General Location ______
Data Entry [illegible] ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
[illegible] Review Initials ______ Review Date ______ [illegible] Status ______
** [illegible] DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM Month July Day 12 Year 2007 Site Name / No: Chester North

Data Reference Number:

Units of Measure (circle one): U.S. / **Metric** (circled) Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL-SERIES Start	AUDITORY: VOCAL-SERIES End	AUDITORY: VOCAL-SERIES #	AUDITORY: VOCAL-SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	/	0432															Begin Survey
	/	0637															End survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown. **(Check Reverse Side When Using 2-Sided Forms)**

Predator: Gray Jay

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CAV

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 13 Year 2007

Area Name: Cedar River Watershed Site Name / Number: S Fk Cedar River #1 Station Number: 3

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) NW, of Q (1/4) NW

UTM zone: 10 E (x) coordinate: 611251 N (y) coordinate: 5242146 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ARR, Inc. Phone: (503) 359-7525

Station Elevation: 728 Ft (M) Position on Slope (circle one): Bottom/plain, (Lower 1/3,) Mid 1/3, Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%,) 3 = 51 to 75%, 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0523 **Table:** North Bend, WA **Begin Survey** Time: 0437 **End Survey** Time: 0644

Temperature at Sunrise: 11.5 ° Temperature at End of Survey: 12.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0437	HI	1	Y	Y	Y	N	N	N	0	N	Begin Survey
0459	HI	2	Y	Y	Y	N	N	N	0	N	
0518	HI	1	Y	Y	Y	N	N	N	0	N	
0523	HI	1	Y	Y	Y	N	N	N	0	N	Sunrise
0545	HI	2	Y	Y	Y	N	N	N	0	N	
0559	HI	2	Y	Y	Y	L-M	N	N	0	N	~~Rain ends at 604~~ 610
0612	HI	3	Y	Y	Y	N	N	N	0	N	
0618	HI	2	Y	Y	Y	L	N	N	0	N	
0628	HI	2	Y	Y	Y-N	M	N	N	0	N	Rain becomes Light 631
0644	HI	2	Y	Y	Y	L	N	N	0	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad. Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

PIWO

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2
Area Name: Cedar River Watershed

Observer (s) Initials: NEJ
Month 07 Day 13 Year 2007
Site Name / No: S Fk Cedar River N
Data Reference Number:
Units of Measure (circle one): U.S. / (Metric)
Station Number: 3

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	VOCAL SERIES End	VOCAL SERIES #	VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0437															Begin Survey, 1st SWTH
	2	0437															1st HETH, 1st VATH
	3	0437															1st CONI, 1st AMRO
	4	0448															1st OSFL
	5	0451															1st WIWR
	6	0454															1st DEJU
	7	0455															1st CBCH
	8	0500															vis on unknown Myotis sp.
	9	0505															1st STJA
	10	0516															1st RBNU
	11	0523															Sunrise, 1st PSFL
	12	0543															1st RECR, 1st RTPT
	13	0555															1st HAWO
	14	0616															1st BCCH
	15	0632															1st PIWO
	16	0644															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.
AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, --- = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).
AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, --- = None or N/A. If both are heard write W / J.
BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, S = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Species of Concern : PIWO ; Potential Predator : STJA

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | CL

Total Detections: Ø

Species of Concern (circle one, details on last pg.): Y or (N)

Month July Day 13 Year 2007

Area Name: Cedar River Watershed Site Name / Number: 155.1A Station Number: 2

Station Location - T 22 N, R 10 (circle one) (E) or W, S 30, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 607568 N (y) coordinate: 5245843 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 825 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: —— Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%,) 4 = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0523 **Table:** North Bend **Begin Survey** Time: 0433 **End Survey** Time: 0708

Temperature at Sunrise: 15 ° Temperature at End of Survey: 15 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	FOG	OTHER	WIND	NOISE	NOTES
0433	HI	1	Y	Y	Y	N	N	N	1	N	Begin Survey
0523	HI	1	Y	Y	Y	N	N	N	2	N	Sunrise
0604	HI	2	Y	Y	Y	M	N	N	1	N	
0626	HI	3	Y	Y	N	H	N	N	1	P	
0632	HI	3	Y	Y	Y	L	L	N	1	N	
0639	HI	3	Y	Y	Y	N	L	N	1	N	*survey extended
0704	LO	3	N	Y	Y	N	M	N	1	N	30 min, due to weather
0707	LO	3	N	N	Y	N	M	N	1	N	
0708	LO	3	N	N	Y	N	M	N	1	N	End survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. ______ Data Point No. ______ Sequence No. ______ Reference No. ______
Quad Code ______ Photo Code ______ General Location ______
Data Entry Initials ______ Data Entry Date ______ Data QC Initials ______ Data QC Date ______
Analyst Review Initials ______ Review Date ______ Highest Biological Status ______
** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month July Day 13 Year 2007

Site Name / No: 155.1A

Data Reference Number: S S

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	VOCAL SERIES End	VOCAL SERIES #	VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	/	0433															Begin Survey
	/	0708															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CAL

Total Detections: 0

Species of Concern (circle one, details on last pg.): **Y** or (**N**)

South Fork Month July Day 17 Year 2007

Area Name: Cedar River watershed Site Name / Number: Cedar River Northeast Station Number: 1

Station Location - **T** 21 **N, R** 10 (circle one) (**E**) or **W** , **S** 10 , **QQ (1/16)** NW , **of Q (1/4)** SE

UTM zone: 10 E (x) coordinate: 611924 N (y) coordinate: 5241408 Source: GPS Datum: NAD83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 801 **Ft** / (**M**) Position on Slope (circle one): **Bottom/plain,** (**Lower 1/3,**) **Mid 1/3, Upper 1/3, Ridgetop**

Station Placement (circle one): (**Inside,**) **Outside**

Distance from Survey Site Boundary: — Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): **1** = 0 to 25%, (**2** = 26 to 50%,) **3** = 51 to 75%, **4** = 76 to 100%

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0527 **Table:** North Bend **Begin Survey** Time: 0440 **End Survey** Time: 0642

Temperature at Sunrise: 16.5 ° Temperature at End of Survey: 17.5 ° (circle one) (**C**) or **F** revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0440	HI	3	Y	Y	Y	N	N	N	1	N	Begin Survey
0527	HI	3	Y	Y	Y	N	N	N	1	N	Sunrise
0624	HI	2	Y	Y	Y	N	N	N	1	N	
0642	HI	2	Y	Y	Y	N	N	N	1	N	End survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

— Review DATABASE Use Only —

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River watershed

Month July Day 17 Year 2007

Site Name / No: South Fork Cedar River Northeast

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0440															Begin Survey
	1	0644															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **---** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **---** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): N [illegible]

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 07 Day 18 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Taylor Ridge Station Number: 3

Station Location - T 22 N, R 8 (circle one) (E) or W, S 26, QQ (1/16) NE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 594696 N (y) coordinate: 5947009 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 1063 Ft (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, Mid 1/3, (Upper 1/3) Ridgetop

Station Placement (circle one): (Inside) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 528 **Table:** North Bend, WA **Begin Survey** Time: 0442 **End Survey** Time: _____

Temperature at Sunrise: 11.5 ° Temperature at End of Survey: 12.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0442	LO	3	N	N	N	M	H	N	1	T	Begin Survey
0456	MID	3	N	N	N	~~M~~ L	H	N	1	T	
0501	MID	3	N	N	Y	N	H	N	1	N	
0518	MID	3	N	N	Y	L	H	N	1	N	
0522	MID	3	N	N	N	M	H	N	1	T	
0533	MID	3	N	N	Y	L	H	N	1	N	
0541	LO	3	N	N	Y	L	H	N	1	N	
0622	LO	3	N	N	Y	N	H	N	1	N	
0658	LO	3	N	N	Y	N	H	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other (explain in Notes).

Occurrence No. _____ Data Point No. _____ Sequence No. _____ Reference No. _____

Quad. Code _____ Photo Code _____ General Location _____

Data Entry Initials _____ Data Entry Date _____ Data QC Initials _____ Data QC Date _____

Protocol Review Initials _____ Review Date _____ Highest Biological Status _____

** WDFW DATABASE USE ONLY **

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 07 Day 18 Year 2007

Site Name / No: Taylor Ridge

Data Reference Number:

Units of Measure (circle one): U.S. (Metric)

Station Number: 3

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0442															Begin Survey
		0451															1st PSFL
		0455															1st HETH
		0458															1st VATH
		0501															1st AMRO
		0509															1st NSWO
		0511															1st DEJU
		0513															1st WIWR
		0532															1st STJA
		0601															1st RCCH
		0626															1st RBNU
		0658															

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Potential Predators: STJA

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): N CMV

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month July Day 18 Year 2007

Area Name: Cedar River watershed Site Name / Number: Rock Creek Station Number: 2

Station Location - T 22 N, R 8 (circle one) (E) or W, S 13, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 596282 N (y) coordinate: 5248774 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 914 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): (1 = 0 to 25%), 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

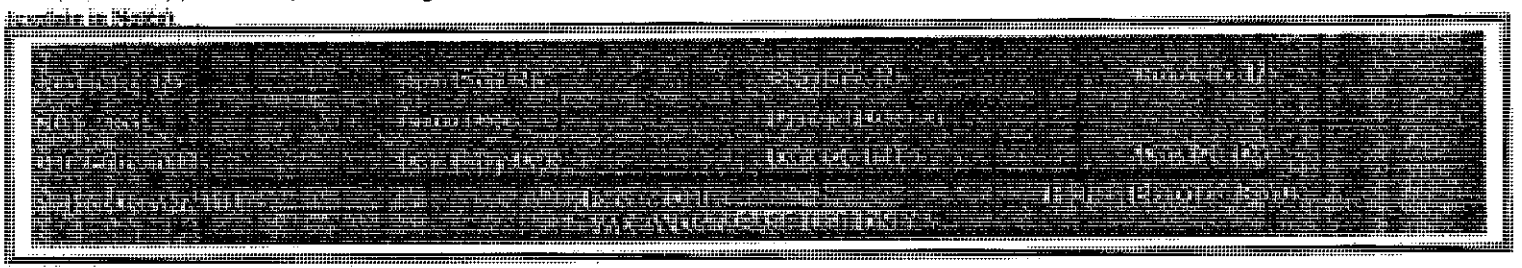
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0528 **Table:** North Bend **Begin Survey** Time: 0443 **End Survey** Time: 0643

Temperature at Sunrise: 13 ° Temperature at End of Survey: 14 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0443	LO	3	N	N	Y	L	M	N	1	N	Begin Survey
0500	LO	3	N	N	Y	N	M	N	2	N	
0520	LO	3	N	N	Y	L	M	N	1	N	
0528	LO	3	N	N	Y	L	M	N	1	N	Sunrise
0643	LO	3	N	N	Y	L	M	N	1	N	End Survey.

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month July Day 18 Year 2007

Site Name / No: Rack Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	/	0443															Begin Survey
	/	0643															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y Car

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month July Day 19 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Rock Creek 3 Station Number: 2

Station Location - T 22 N, R 8 (circle one) (E) or W, S 13, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 596282 N (y) coordinate: 5248774 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 914 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: — Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): (1 = 0 to 25%) 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

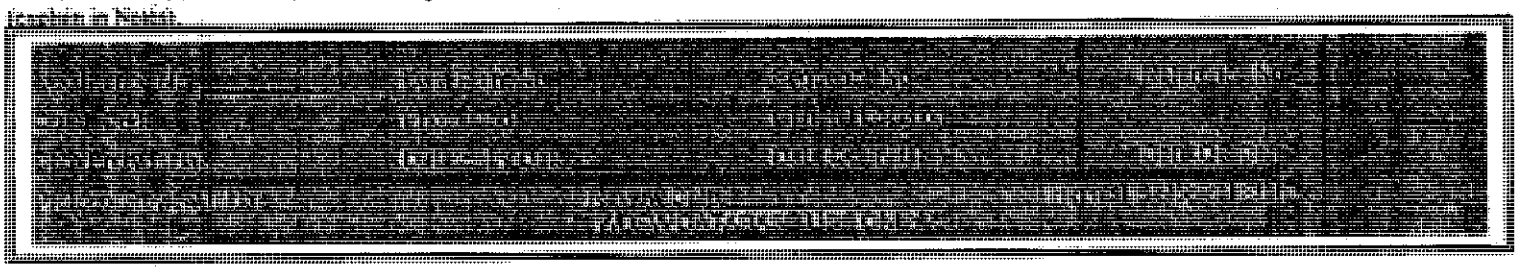
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0529 **Table:** North Bend **Begin Survey** Time: 0438 **End Survey** Time: 0644

Temperature at Sunrise: 10 ° Temperature at End of Survey: 11 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0438	HI	3	Y	Y	Y	N	N	N	2	N	Begin Survey
0503	HI	2	Y	Y	Y	N	N	N	2	N	
0529	HI	2	Y	Y	Y	N	N	N	2	N	Sunrise
0644	HI	2	Y	Y	Y	N	N	N	2	N	End survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River Watershed

Month July Day 19 Year 2007

Site Name / No: Rock Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	✓	0438															Begin Survey
	✓	0644															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown. **(Check Reverse Side When Using 2-Sided Forms)**

Predators: Steller's Jay, Common Raven

Species of Concern: Pileated Woodpecker, Common Loon

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | Cmw

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 19 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Taylor Ridge Station Number: 3

Station Location - T 22 N, R 8 (circle one) (E) or W, S 26, QQ (1/16) NE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 594696 N (y) coordinate: 5947009 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 1063 Ft / (M) Position on Slope (circle one): **Bottom/plain**, **Lower 1/3**, **Mid 1/3**, (Upper 1/3,) **Ridgetop**

Station Placement (circle one): (Inside,) **Outside**

Distance from Survey Site Boundary: 0m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): **1** = 0 to 25%, (**2** = 26 to 50%,) **3** = 51 to 75%, **4** = 76 to 100%

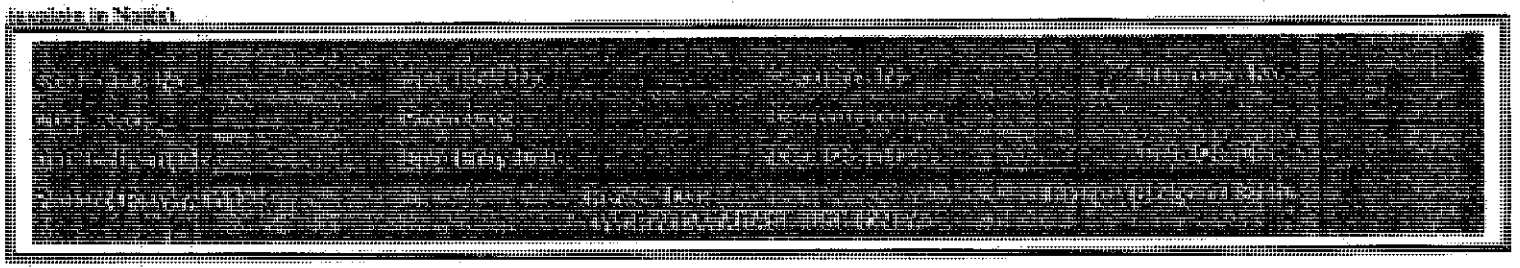
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 529 **Table:** North Bend, WA **Begin Survey** Time: 0444 **End Survey** Time: 0657

Temperature at Sunrise: 9.5 ° Temperature at End of Survey: 10.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0444	MID	3	N	Y	Y	N	M	N	0	N	Begin Survey
0452	HI	3	Y	Y	Y	N	L	N	0	N	
0503	HI	2	Y	Y	Y	N	L	N	0	N	
0514	HI	3	Y	Y	Y	N	L	N	0	N	very light fog
0529	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0545	HI	3	Y	Y	Y	L	L	N	0	N	very light fog, very light rain
0551	HI	3	Y	Y	Y	N	L	N	0	N	
0559	HI	3	Y	Y	Y	N	N	N	0	N	
0608	HI	2	Y	Y	Y	N	N	N	1	N	
0657	HI	2	Y	Y	Y	N	N	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2
Area Name: Cedar River Watershed

Observer (s) Initials: NEJ
Month 07 Day 19 Year 2007
Site Name / No: Taylor Ridge
Data Reference Number:
Units of Measure (circle one): U.S. / (Metric)
Station Number: 3

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I/O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	VOCAL SERIES End	VOCAL SERIES #	VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES (Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint))
		0444															Begin Survey
		0444															1st PSFL, 1st VATH
		0449															1st SWTH
		0454															1st HETH
		0456															1st AMRO
		0510															1st BCCH
		0520															1st DEJU
		0548															1st STJA, 1st SPTO
		0556															1st RBNU
		0620															1st PIWO
		0629															1st RECR
		0657															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.
AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).
AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.
BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown. **(Check Reverse Side When Using 2-Sided Forms)**

Murrelet Predators: STJA (Steller's Jay)
Species of Concern: SPTO (Spotted Towhee), PIWO (Pileated Woodpecker)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): N CMP

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month July Day 20 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lindsay Creek Station Number: 1

Station Location - T 21 N, R 9 (circle one) (E) or W, S 4, QQ (1/16) SE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 601172 N (y) coordinate: 5243187 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 871 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: — Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%), 4 = 76 to 100%

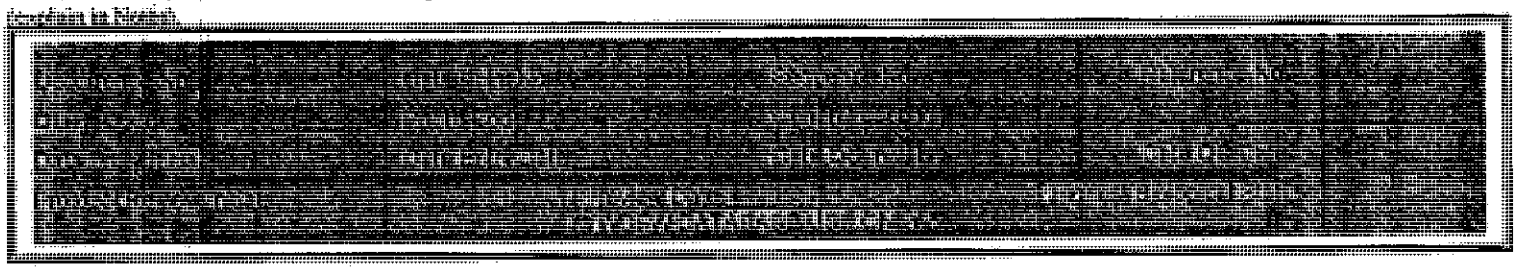
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0530 **Table:** North Bend **Begin Survey** Time: 0445 **End Survey** Time: 0715

Temperature at Sunrise: 11 ° Temperature at End of Survey: 12 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0445	UL	0	Y	Y	Y	N	N	N	1	N	Begin Survey
0503	MID	2	N	Y	Y	N	M	N	1	N	
0522	HI	1	Y	Y	Y	N	L	N	1	N	
0530	HI	1	Y	Y	Y	N	N	N	1	N	Sunrise
0645	UL	0	Y	Y	Y	N	N	N	1	N	
0715	UL	0	Y	Y	Y	N	N	N	1	N	End Survey*
											*survey extended
											due to fog out.

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River Watershed

Month July Day 20 Year 2007

Site Name / No: Lindsay Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0445															Begin Survey
	1	0715															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Predators: Stellers Jay

Species of concern: Vahx's Swift

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMR

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month 07 Day 20 Year 2007

Area Name: Cedar River Watershed Site Name / Number: 155.1A Station Number: 2

Station Location - T 22 N, R 10 (circle one) (E) or W, S 30, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 607568 N (y) coordinate: 5245843 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 825 Ft (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): (1 = 0 to 25%,) 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

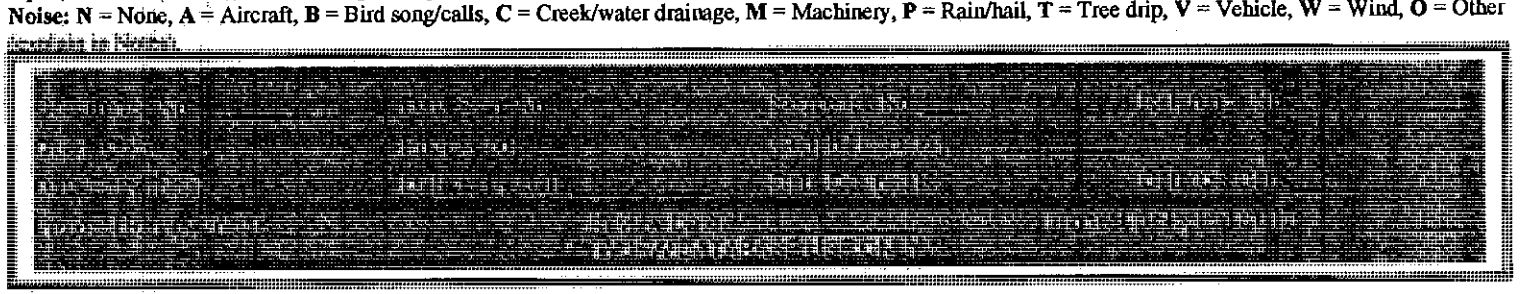
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0530 **Table:** North Bend, WA **Begin Survey** Time: 0444 **End Survey** Time: 0645

Temperature at Sunrise: 11.5 ° Temperature at End of Survey: 12.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0444	HI	3	Y	Y	Y	N	N	N	2	N	Begin Survey, wind gusts to 3
0530	HI	3	Y	Y	Y	N	N	N	2	N	gusts to 3, Sunrise
0638	HI	2	Y	Y	Y	N	N	N	2	N	gusts to 3
0645	HI	2	Y	Y	Y	N	N	N	2	N	End Survey, gusts to 3

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 — Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 07 Day 20 Year 2007

Site Name / No: 155.1A

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0444															Begin Survey
		0536															Sunrise
		0645															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMB

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month July Day 25 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lindsay creek Station Number: 1

Station Location - T 21 N, R 9 (circle one) (E) or W, S 4, QQ (1/16) SE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 601172 N (y) coordinate: 5243187 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 871 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%,) 4 = 76 to 100%

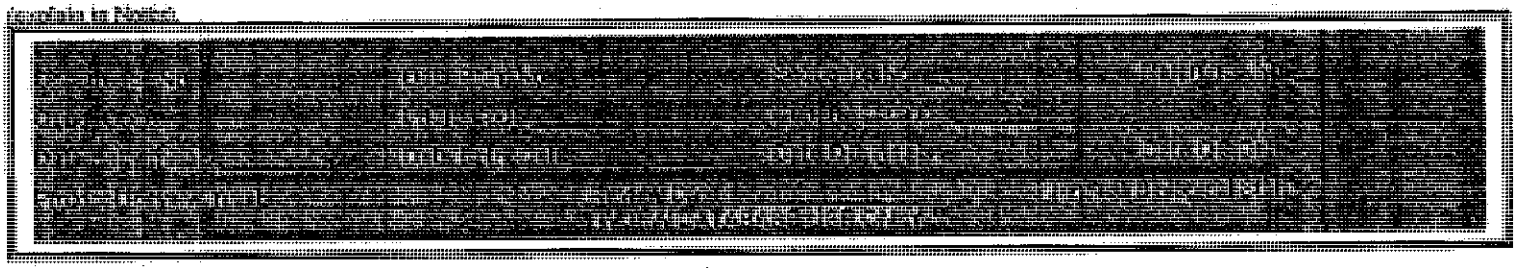
ENVIRONMENTAL CONDITIONS:

Official Sunrise Time: 0536 Table: North Bend Begin Survey Time: 0449 End Survey Time: 0651

Temperature at Sunrise: 10 ° Temperature at End of Survey: 11 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0449	UL	0	Y	Y	Y	N	N	N	0	N	Begin Survey
0513	HI	1	Y	Y	Y	N	N	N	0	N	
0520	HI	2	Y	Y	Y	N	N	N	0	N	
0536	HI	3	Y	Y	Y	N	N	N	0	N	sunrise
0630	HI	2	Y	Y	Y	N	N	N	0	N	
0651	HI	2	Y	Y	Y	N	N	N	0	N	End Survey

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River Watershed

Month July Day 25 Year 2007

Site Name / No: Lindsay Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0449															Begin Survey
	1	0651															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Predators: Stellar's Jay

Species of Concern: Vaux's Swifts

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | Lnr

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 25 Year 2007

Area Name: Cedar River Watershed Site Name / Number: S Fk Cedar River NE Station Number: 1

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) NW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 611924 N (y) coordinate: 5241408 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ARR, Inc Phone: (503) 359-7525

Station Elevation: 801 Ft (M) Position on Slope (circle one): Bottom/plain, (Lower 1/3,) Mid 1/3, Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: 0m Units of Measure for **ALL** Horizontal Distances: Meters

Station Canopy Cover (circle one): (1 = 0 to 25%,) 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

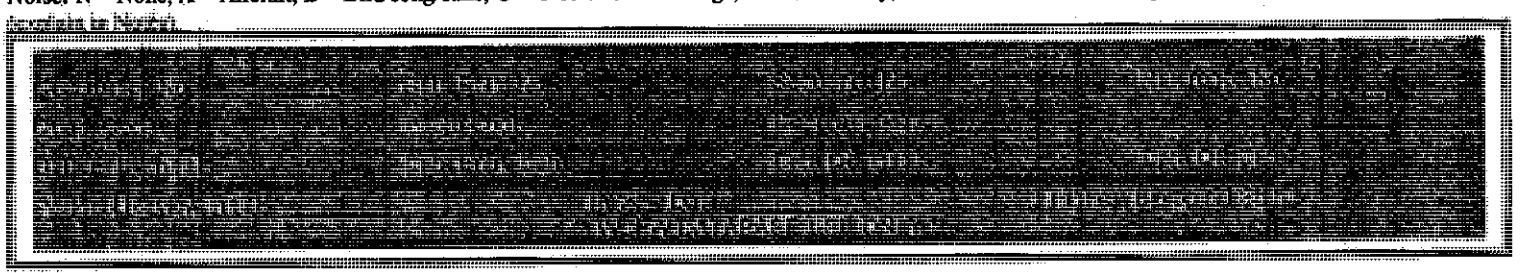
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0536 **Table:** North Bend, WA **Begin Survey** Time: 0451 **End Survey** Time: 0651

Temperature at Sunrise: 8.5 ° Temperature at End of Survey: 10.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0451	UL	0	Y	Y	Y	N	L	N	0	N	Begin Survey
0536	UL	0	Y	Y	Y	N	L	N	0	N	Sunrise
0545	HI	2	Y	Y	Y	N	L	N	0	N	
0550	HI	3	Y	Y	Y	N	L	N	1	N	
0651	HI	3	Y	Y	Y	N	L	N	1	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sml. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 — Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ — Month 07 Day 25 Year 2007 — Site Name / No: S. Fk. Cedar River NE

Data Reference Number: — Units of Measure (circle one): U.S. / (Metric) — Station Number: 1

SURVEY ACYIVITY: — **Note Significant Weather Changes on Page 1** — revised: 2 / 2000

STATUS - I/O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	VOCAL SERIES End	VOCAL SERIES #	VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES (Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint))
		0451															Begin Survey, 1st CONI
		0453															1st VATH, 1st AMRO
		0454															1st OSFL
		0455															1st HETH
		0506															1st WIWR
		0508															1st SPTO
		0510															1st WIWA
		0536															Sunrise
		0554															1st STJA
		0558															1st Townsend's Chipmunk
		0608															1st CBCH
		0611															1st PIWO
		0616															1st CORA, 1st RBNU
		0637															1st DEJU
		0651															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Murrelet Predators: Steller's Jay, Common Raven, Townsend's Chipmunk

Species of Concern: Spotted Towhee, Pileated

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y | a-

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month July Day 26 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Findley Creek Station Number: *2 (visual)

Station Location - T 21 N, R 10 (circle one) (E) or W, S 6, QQ (1/16) SW, of Q (1/4) NW

UTM zone: 10 E (x) coordinate: 606438 N (y) coordinate: 5243247 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 832 Ft (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

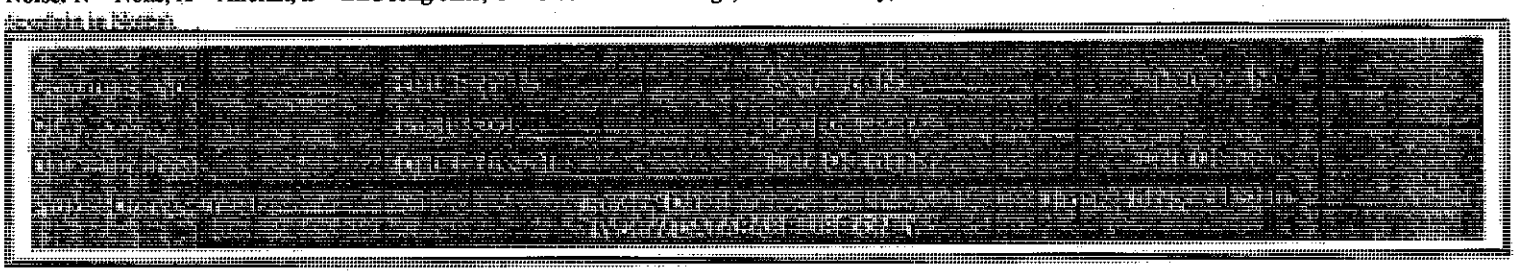
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0537 **Table**: North Bend **Begin Survey** Time: 0450 **End Survey** Time: 0652

Temperature at Sunrise: 10 ° Temperature at End of Survey: 9.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0450	UL	0	Y	Y	N	N	N	N	1	C	Begin Survey
0537	UL	0	Y	Y	N	N	N	N	1	C	Sunrise
0652	UL	0	Y	Y	N	N	N	N	1	C	End Survey
											*Tandem survey with NEJ @ station 2 (audio)

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sml. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month July Day 26 Year 2007

Site Name / No: Findley Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2 (visual)

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY					# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
					VOCAL SERIES				OTHER								
					Start	End	#	OL	W / J								
	1	0450															Begin Survey
	1	0652															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMG

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or (N)

Month 07 Day 26 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Findley Creek Station Number: 2a

Station Location - T 21 N, R 10 (circle one) (E) or W, S 6, QQ (1/16) SW, of Q (1/4) NW

UTM zone: 10 E (x) coordinate: 606438 N (y) coordinate: 5243200 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 897 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

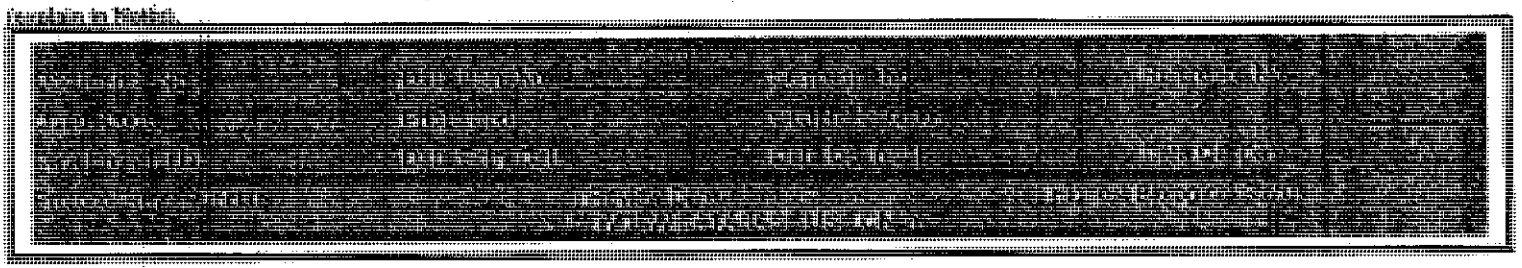
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0537 **Table:** Mt. Vernon, WA **Begin Survey** Time: 0452 **End Survey** Time: 0652

Temperature at Sunrise: 10.0 ° Temperature at End of Survey: 9.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0449	UL	0	Y	Y	Y	N	N	N	1	0	Begin Survey
0529	UL	0	Y	Y	Y	N	N	N	2	0	
0537	UL	0	Y	Y	Y	N	N	N	2	0	Sunrise
0652	UL	0	Y	Y	Y	N	N	N	2	0	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: MEJ

Month 07 Day 26 Year 2007

Site Name / No: Findley Creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2a

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (M units)	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
		0449															Begin Survey, 1st VATH
		0452															1st Myotis species (vis.)
		0511															1st CBCH
		0516															1st OSFL
		0522															1st WIWR
		0529															1st PSFL
		0537															Sunrise
		0550															1st SWTH
		0612															1st DEJU
		0627															1st SPTO
		0652															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CW

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Month 07 Day 27 Year 2007

Area Name: Cedar River Watershed Site Name / Number: 155.1A Station Number: 2

Station Location - T 22 N, R 10 (circle one) (E) or W, S 30, QQ (1/16) SW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 607568 N (y) coordinate: 5245843 Source: GPS Datum: NAD83 FOM: 0

Observer (s) Name: Neil Eric Jensen Initials: NEJ Affiliation: ABR, Inc. Phone: (503) 359-7525

Station Elevation: 825 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one) (Inside,) Outside

Distance from Survey Site Boundary: 0m Units of Measure for ALL Horizontal Distances: Meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, (3 = 51 to 75%,) 4 = 76 to 100%

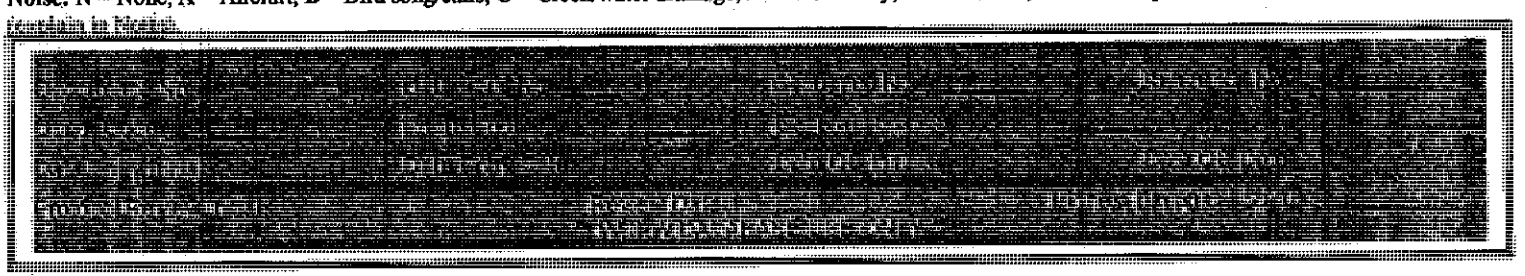
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0539 **Table:** North Bend, WA **Begin Survey** Time: 0454 **End Survey** Time: 0654

Temperature at Sunrise: 9.5 ° Temperature at End of Survey: 10.0 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0454	HI	3	Y	Y	Y	N	N	N	0	N	Begin Survey
0539	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0654	HI	3	Y	Y	Y	N	N	N	0	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 9 | Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: NEJ

Month 07 Day 27 Year 2007

Site Name / No: 15C1A

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 2

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN (m) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0454															Begin Survey, 1st CONI
	2	0459															1st VATH
	3	0518															1st PSFL
	4	0521															1st Myotis sp. (vis)
	5	0529															1st WIWR
	6	0537															1st Douglas Tree Squirrel
	7	0539															Sunrise
	8	0544															1st RUHU
	9	0554															1st BCCH
	10	0615															1st PIWO
	11	0641															1st AMRO
	12	0654															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Murrelet Predators: Douglas Tree Squirrel

Species of Concern: Pileated Woodpecker

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMR

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

South Fork Month July Day 27 Year 2007

Area Name: Cedar River watershed Site Name / Number: Cedar River North Station Number: 3

Station Location - T 21 N, R 10 (circle one) (E) or W, S 10, QQ (1/16) NW, of Q (1/4) NW

UTM zone: 10 E (x) coordinate: 611251 N (y) coordinate: 5242146 Source: GPS Datum: NAD83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 728 Ft / (M) Position on Slope (circle one): Bottom/plain, (Lower 1/3), Mid 1/3, Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: — Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): (1 = 0 to 25%,) 2 = 26 to 50%, 3 = 51 to 75%, 4 = 76 to 100%

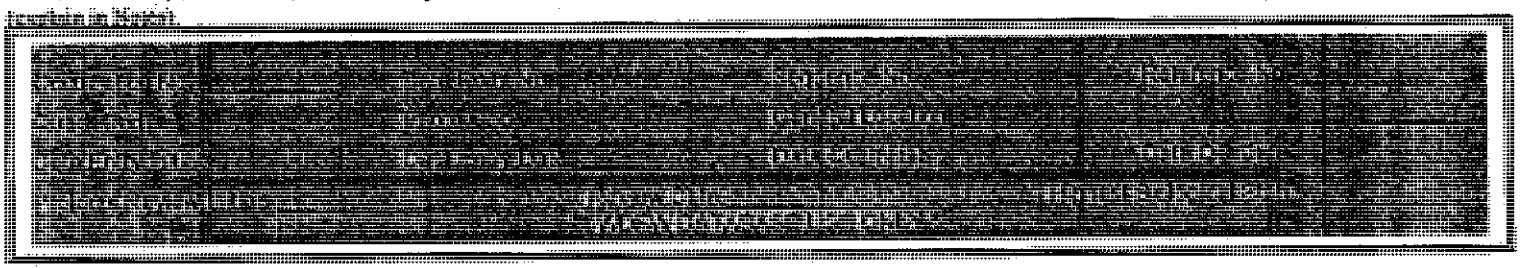
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0539 **Table:** North Bend **Begin Survey** Time: 0450 **End Survey** Time: 0654

Temperature at Sunrise: 11 ° Temperature at End of Survey: 11 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0450	HI	3	Y	Y	Y	N	N	N	0	N	Begin survey
0539	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0621	HI	2	Y	Y	Y	N	N	N	0	N	
0654	HI	2	Y	Y	Y	N	N	N	0	N	End Survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: **0** = 0%, **1** = 33%, **2** = 66%, **3** = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: **0** = <1 mph (calm), **1** = 1-3 mph (leaves barely move), **2** = 4-7 mph (leaves rustle, sm. twigs move), **3** = 8-12 mph (leaves & sm. twigs in constant motion), **4** = 13-18 mph (sm. branches move), **5** = 19-24 mph (lg. branches & sm. trees start to sway), **6** = 25-31 mph (lg. branches in constant motion), **7** = 32-38 mph (whole trees move), **8** = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River watershed

Observer (s) Initials: AJM

Month July Day 27 Year 2007

Site Name / No: South Fork Cedar River North

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 3

SURVEY ACYIVITY:

Note Significant Weather Changes on Page 1

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0450															Begin Survey
	1	0654															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Predators: Stellars Jay

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMA

Page 1 of 2

Total Detections: 10

Species of Concern (circle one, details on last pg.): (Y) or N

Month July Day 28 Year 2007

Area Name: Cedar River watershed Site Name / Number: Chester North Station Number: 2

Station Location - T 22 N, R 9 (circle one) (E) or W, S 16, QQ (1/16) SE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 601264 N (y) coordinate: 5249531 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 977 Ft / (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3,) Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%,) 3 = 51 to 75%, 4 = 76 to 100%

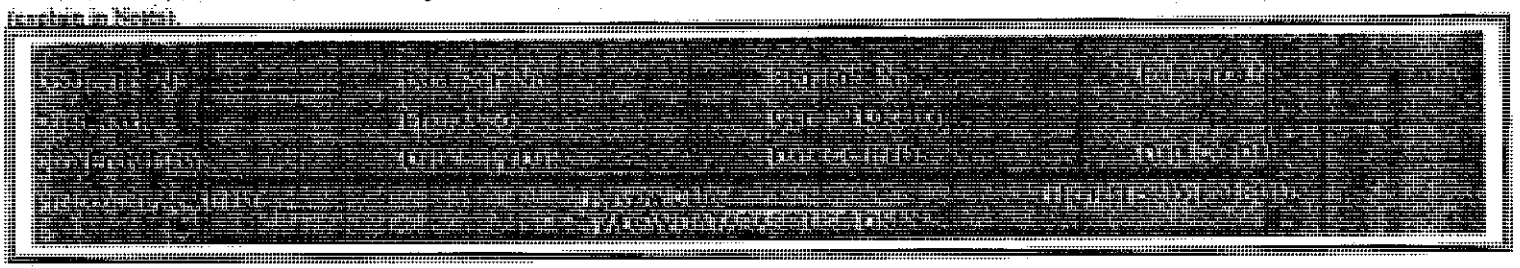
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0540 **Table:** North Bend **Begin Survey** Time: 0452 **End Survey** Time: 0655

Temperature at Sunrise: 13.5 ° Temperature at End of Survey: 12.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0452	UL	0	Y	Y	Y	N	N	N	0	0	Begin Survey
0540	UL	0	Y	Y	Y	N	N	N	0	0	Sunrise
0655	UL	0	Y	Y	Y	N	N	N	0	0	End survey

Ceiling: **UL** = Unlimited (clear), **HI** = >2.0 canopy height, **MID** = >1.25 to ≤ 2.0 canopy height, **LO** = ≤1.25 canopy height, **U** = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Horizontal Visibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection), **U** = Unknown.
Audibility: **N** = Impaired (detections may be missed due to conditions), **Y** = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: **N** = None, **L** = Light, **M** = Moderate, **H** = Heavy. **Other:** **H** = Hail, **S** = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: **N** = None, **A** = Aircraft, **B** = Bird song/calls, **C** = Creek/water drainage, **M** = Machinery, **P** = Rain/hail, **T** = Tree drip, **V** = Vehicle, **W** = Wind, **O** = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Area Name: Cedar River Watershed

Observer (s) Initials: AJM

Month July Day 28 Year 2007

Site Name / No: Chester North

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric) Station Number: 2

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0452															Begin Survey
	1	0655															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Species of concern: common loon

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y CMH

Total Detections: 0

Species of Concern (circle one, details on last pg.): Y or (N)

Month July Day 29 Year 2007

Area Name: Cedar River Watershed Site Name / Number: Lost Creek Station Number: 1

Station Location - T 22 N, R 8 (circle one) (E) or W, S 14, QQ (1/16) NE, of Q (1/4) NE

UTM zone: 10 E (x) coordinate: 594882 N (y) coordinate: 5250301 Source: GPS Datum: NAD 83 FOM: —

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 739 Ft (M) Position on Slope (circle one): Bottom/plain, Lower 1/3, (Mid 1/3), Upper 1/3, Ridgetop

Station Placement (circle one): (Inside), Outside

Distance from Survey Site Boundary: — Units of Measure for ALL Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, (2 = 26 to 50%), 3 = 51 to 75%, 4 = 76 to 100%

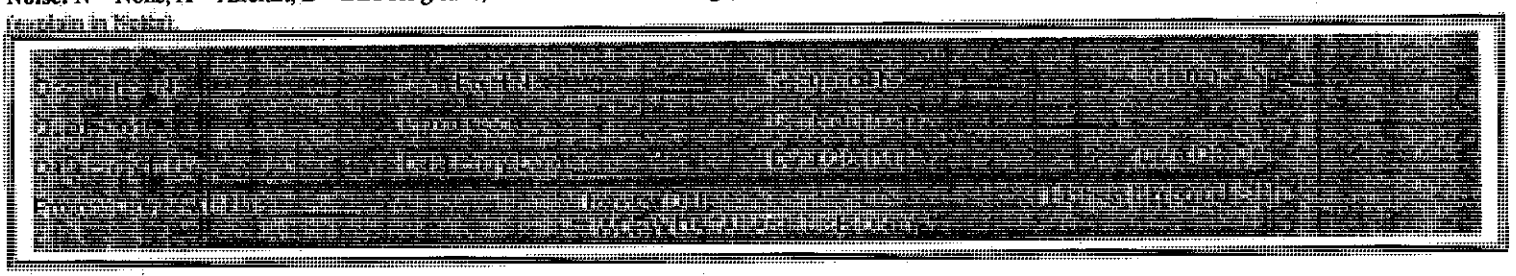
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0541 **Table:** North Bend **Begin Survey** Time: 0450 **End Survey** Time: 0726

Temperature at Sunrise: 14.0 ° Temperature at End of Survey: 13.5 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING			HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION			WIND	NOISE	NOTES
	CEILING	CLOUD COVER	VISIBILITY TO 2 CANOPY			RAIN	FOG	OTHER			
0450	HI	3	Y	Y	Y	N	N	N	0	N	Begin Survey
0541	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0726	HI	3	Y	Y	Y	N	N	N	0	N	End Survey
											* Survey extended
											30 min. due to
											Clouds

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River watershed

Month July Day 29 Year 2007

Site Name / No: Lost creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1**

revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
I	1	0450															Begin Survey
I	2	0726															End survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (Y or N).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown.

(Check Reverse Side When Using 2-Sided Forms)

Predator: Stellar's Jay

WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Survey Visit to Protocol (Y or N, initials): Y KMB

Page 1 of 2

Total Detections: 0

Species of Concern (circle one, details on last pg.): (Y) or N

Area Name: Cedar River Watershed Site Name / Number: South Fork Taylor Creek Month July Day 30 Year 2007 Station Number: 1

Station Location - T 22 N, R 8 (circle one) (E) or W, S 32, QQ (1/16) NW, of Q (1/4) SE

UTM zone: 10 E (x) coordinate: 589807 N (y) coordinate: 5744497 Source: GPS Datum: NAD 83 FOM:

Observer (s) Name: Alden J. Miller Initials: AJM Affiliation: ABR Inc. Phone: (503) 359-7525

Station Elevation: 434 Ft / (M) Position on Slope (circle one): (Bottom/plain,) Lower 1/3, Mid 1/3, Upper 1/3, Ridgetop

Station Placement (circle one): (Inside,) Outside

Distance from Survey Site Boundary: _____ Units of Measure for **ALL** Horizontal Distances: meters

Station Canopy Cover (circle one): 1 = 0 to 25%, 2 = 26 to 50%, 3 = 51 to 75%, (4 = 76 to 100%)

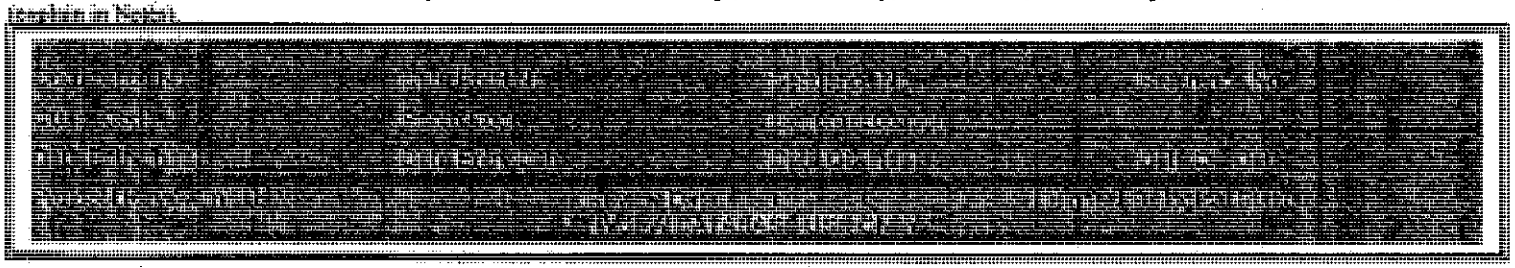
ENVIRONMENTAL CONDITIONS:

Official **Sunrise** Time: 0542 **Table:** North Bend **Begin Survey** Time: 0457 **End Survey** Time: 0657

Temperature at Sunrise: 9 ° Temperature at End of Survey: 9 ° (circle one) (C) or F revised: 2 / 2000

TIME	VERTICAL VIEWING: CEILING	VERTICAL VIEWING: CLOUD COVER	VERTICAL VIEWING: VISIBILITY TO 2 CANOPY	HORIZ. VIS. TO 100 M	AUDIBILITY TO 200 M	PRECIPITATION: RAIN	PRECIPITATION: FOG	PRECIPITATION: OTHER	WIND	NOISE	NOTES
0457	HI	3	Y	Y	Y	N	N	N	0	N	Begin survey
0542	HI	3	Y	Y	Y	N	N	N	0	N	Sunrise
0610	HI	2	Y	Y	Y	N	N	N	0	N	
0617	HI	1	Y	Y	Y	N	N	N	0	N	
0644	HI	2	Y	Y	Y	N	N	N	0	N	
0657	HI	2	Y	Y	Y	N	N	N	0	N	End survey

Ceiling: UL = Unlimited (clear), HI = >2.0 canopy height, MID = >1.25 to ≤ 2.0 canopy height, LO = ≤1.25 canopy height, U = Unknown.
Cloud Cover: 0 = 0%, 1 = 33%, 2 = 66%, 3 = 100%.
Vertical Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Horizontal Visibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection), U = Unknown.
Audibility: N = Impaired (detections may be missed due to conditions), Y = Unimpaired (conditions allow for reliable detection).
Precipitation - Rain & Fog: N = None, L = Light, M = Moderate, H = Heavy. **Other:** H = Hail, S = Snow. Indicate intensity using same codes for rain & fog.
Wind: 0 = <1 mph (calm), 1 = 1-3 mph (leaves barely move), 2 = 4-7 mph (leaves rustle, sm. twigs move), 3 = 8-12 mph (leaves & sm. twigs in constant motion), 4 = 13-18 mph (sm. branches move), 5 = 19-24 mph (lg. branches & sm. trees start to sway), 6 = 25-31 mph (lg. branches in constant motion), 7 = 32-38 mph (whole trees move), 8 = 39-46 mph (twigs & sm. branches break).
Noise: N = None, A = Aircraft, B = Bird song/calls, C = Creek/water drainage, M = Machinery, P = Rain/hail, T = Tree drip, V = Vehicle, W = Wind, O = Other



WASHINGTON MARBLED MURRELET FOREST SURVEY FORM

Detections - This Side Page Total: 0 Pg. 2 of 2

Observer (s) Initials: AJM

Area Name: Cedar River watershed

Month July Day 30 Year 2007

Site Name / No: South Fork Taylor creek

Data Reference Number:

Units of Measure (circle one): U.S. / (Metric)

Station Number: 1

SURVEY ACYIVITY: **Note Significant Weather Changes on Page 1** revised: 2 / 2000

STATUS - I / O	DETECTION #	DETECTON TIME	INITIAL DETECTION DIRECTION	TYPE	AUDITORY: VOCAL SERIES Start	AUDITORY: VOCAL SERIES End	AUDITORY: VOCAL SERIES #	AUDITORY: VOCAL SERIES OL	AUDITORY: OTHER W / J	# BIRDS SEEN	BEHAVIOR	INITIAL FLIGHT DIRECTION	BIRD HEIGHT SEEN Canopy= 1.0	CLOSEST DIST. TO BIRDS SEEN ( ) units	DEPART FLIGHT DIRECTION	FINAL DETECTION DIRECTION	NOTES Heard Only Dist. To Birds (L= Loud, M= Moderate, F= Faint)
	1	0457															Begin Survey
	1	0657															End Survey

TYPE: **H** = Heard Only (no visual), **S** = Seen Only (silent), **B** = Both Seen and Heard.

AUDITORY - Vocal Series (Vocalizations): **K** = KEER calls, **G** = Groan (alternate) calls, **O** = Whistle or Soft Que calls, **U** = Unknown, **—** = None or N/A. Indicate the vocal type heard at both the start and end if calls grade between different types during the detection. Indicate the number heard **1-5** or **M** = Multiple. **OL** = Overlapping Vocalizations (**Y** or **N**).

AUDITORY - Other (Non-Vocal Sounds): **W** = Wing Sound, **J** = Jet Sound, **—** = None or N/A. If both are heard write W / J.

BEHAVIOR: **F** = Flight Over Canopy, **C** = Circle Over Canopy, **T** = Fly-Through At or Below Canopy (≤ 1.0), **B** = Circle At or Below Canopy (≤ 1.0), **L** = Seen Landing in or Departing From a Tree, **S** = Stationary Calling (fixed-point multiple calls <100 m), **U** = Unknown. **(Check Reverse Side When Using 2-Sided Forms)**

Species of concern: Pileated Woodpecker predator: Gray Jay