

## Appendix L

### Marbled Murrelet Owl Data and Protocol





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## L. MARBLED MURRELET DATA AND PROTOCOL

### L.1 Marbled Murrelet Surveys on MRC Land from 1994-2005

Table L-1 includes all known marbled murrelet surveys and occurrences in the plan area from 1994-2005. The earliest data obviously pre-dates MRC ownership of the land. Most of the murrelet surveys used either ground observation or radar detection exclusively. The highlighted surveys were carried out with both ground observation and radar detection. In these latter instances, Table L-1 shows under “# Surveys” all completed surveys (i.e. both ground observations and radar detections), even though they may have been completed concurrently. The number in the “Radar” column indicates the number of murrelet-type targets detected by radar operators.

#### DEFINITION

A murrelet-type target is one that (a) occurs in a specific window of time—namely 1 ½ hours before or after sunrise; (b) has a recorded flight speed of at least 40 mph; and (c) appears to have a size typical for a murrelet.

Table L-1 shows all detections for a location, often compiled over multiple surveys. It is important to understand that detections do not necessarily indicate occupancy; on several occasions, for example, observers detected murrelets flying at least a kilometer away.

**Table L-1 Murrelet Surveys**

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
Albion	Albion River 1995A	1995	435252	343549	0	8	N <sup>3</sup>
Albion	Albion River 1995B	1995	437896	343615	0	8	N
Albion	Enchanted Meadow	1996	437896	343615	0	3	N
Albion	Tom Bell Flat	1996	444617	346577	0	1	N
Albion	Albion	2000	433787	341630	0	3	13
Albion	Comptche-Ukiah 1	2000	441820	347618	0	4	N
Albion	Comptche-Ukiah 2	2000	441950	347770	0	4	N
Albion	Deadman	2000	437911	343597	0	4	N
Albion	Escola	2000	441548	345162	0	4	N
Albion	Confluence	2001	441504	345203	0	5	N
Albion	Lower Albion	2001	437932	343630	0	3	6
Albion	Lower Albion	2002	437932	343630	0	3	3
Albion	Comptche Motocross 1	2003	446088	347329	0	3	N
Albion	Comptche Motocross 2	2003	446336	347556	0	1	N
Albion	Comptche Motocross 3	2003	446348	347274	0	1	N
Albion	Comptche Motocross 1	2004	446088	347329	0	1	N
Albion	Comptche Motocross 4	2004	446140	347623	0	1	N
Albion	Comptche Motocross 5	2004	446389	347179	0	1	N
Albion	Comptche Motocross 6	2004	446504	347195	0	1	N
Albion	Comptche Motocross 7	2004	446440	347750	0	1	N
Albion	Comptche Motocross 4	2005	446140	347623	0	1	N

<sup>1</sup> Using NAD27 projection

<sup>2</sup> All murrelet-type targets are included in the radar detections column. In some cases, a ground observer accompanies the radar truck operator to confirm if radar detections are actual murrelets; the accompaniment of a ground observer is not generally the case. When there is no ground observer, the ground detections column will show “N”.

<sup>3</sup> N indicates that there were no radar surveys at this location in this year.

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
Albion	Comptche Motocross 6	2005	446504	347195	0	2	N
Albion	Comptche Motocross 8	2005	446395	347043	0	2	N
Albion	Comptche Motocross 9	2005	446346	347340	0	2	N
Albion	Comptche Motocross 10	2005	446171	347259	0	1	N
Albion	Comptche Motocross 11	2005	446208	347672	0	1	N
Albion	Nursey Gulch 1	2007	445845	342565	0	3	N
Albion	Nursey Gulch 2	2007	445635	342601	0	3	N
Albion	Table Mountain 1	2008	439254	342283	0	1	N
Albion	Table Mountain 2	2008	439265	342247	0	1	N
Albion	Table Mountain 3	2008	439263	342269	0	1	N
Big River	Russell Brook 1	1995	457136	350134	0	5	N
Big River	Russell Brook 2	1995	458945	349062	0	5	N
Big River	Russell Brook 1	1996	457136	350134	0	1	N
Big River	Russell Brook 2	1996	458945	349062	0	1	N
Big River	Russell Brook 2000	2000	458439	350048	0	4	N
Big River	Russell Brook 3	2001	458119	350021	0	3	N
Big River	Russell Brook 4	2001	458934	349611	0	2	N
Big River	Russell Brook 5	2001	457273	350489	0	1	0
Big River	Russell Brook 6	2001	457608	350296	0	1	0
Big River	Russell Brook 7	2004	458898	349594	0	2	N
Big River	Russell Brook 8	2004	459073	349058	0	1	N
Big River	Russell Brook 9	2004	457144	350181	0	1	N
Big River	Russell Brook 10	2004	458926	349173	0	1	N
Big River	Russell Brook 7	2005	458898	349594	0	1	N
Big River	Russell Brook 8	2005	459073	349058	0	2	N
Big River	Russell Brook 9	2005	457144	350181	0	2	N
Big River	Russell Brook 10	2005	458926	349173	0	1	N
Big River	Russell Brook 11	2005	459547	348607	0	1	N

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
Big River	Russell Brook 12	2005	459779	348646	0	1	N
Big River	Russell Brook 13	2005	459311	348706	0	1	N
Big River	Russell Brook 14	2005	459835	348605	0	1	N
Big River	Russell Brook 15	2005	459379	348557	0	1	N
Big River	Russell Brook 16	2005	459315	348642	0	1	N
Big River	Russell Brook 17	2005	459649	348616	0	1	N
Big River	Russell Brook 18	2005	459421	348603	0	1	N
Big River	Russell Brook 19	2005	459600	348614	0	1	N
Big River	Russell Brook 20	2005	459384	348616	0	1	N
Big River	Russell Brook 21	2005	459717	348588	0	1	N
Big River	Russell Brook 22	2005	459427	348925	0	1	N
Big River	Russell Brook 23	2005	459865	348580	0	1	N
Big River	Russell Brook 24	2005	459810	348515	0	1	N
Big River	Russell Brook 25	2005	459311	348706	0	1	N
Big River	Russell Brook 25	2006	459311	348706	0	1	N
Big River	Russell Brook 16	2006	459315	348642	0	1	N
Big River	Russell Brook 15	2006	459379	348557	0	1	N
Big River	Russell Brook 20	2006	459384	348615	0	1	N
Big River	Russell Brook 18	2006	459421	348603	0	1	N
Big River	Russell Brook 22	2006	459427	348925	0	1	N
Big River	Russell Brook 11	2006	459547	348607	0	1	N
Big River	Russell Brook 19	2006	459600	348614	0	1	N
Big River	Russell Brook 17	2006	459649	348616	0	1	N
Big River	Russell Brook 21	2006	459717	348588	0	1	N
Big River	Russell Brook 12	2006	459779	348646	0	1	N
Big River	Russell Brook 24	2006	459810	348515	0	1	N
Big River	Russell Brook 14	2006	459835	348605	0	1	N
Big River	Russell Brook 26	2006	459878	348577	0	1	N



Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
Big River	Russell Brook 27	2008	457804	350235	0	2	Y
Big River	Russell Brook 28	2008	459736	349180	N	3	1
Big River	Russell Brook 29	2008	459515	349546	N	4	2
Big River	Russell Brook 30	2008	457233	351052	0	1	N
Big River	Russell Brook 31	2008	460332	348872	0	1	N
Big River	Russell Brook 32	2008	459415	350197	0	1	N
Big River	Russell Brook 33	2008	460586	349502	0	1	N
Big River	Russell Brook 34	2008	460006	349028	0	1	N
Big River	Russell Brook 35	2008	458425	350005	0	1	N
Big River	Wheeler Gulch 1	2004	463790	351448	0	2	N
Big River	Wheeler Gulch 2	2004	463117	351243	0	1	N
Big River	Wheeler Gulch 3	2004	463441	351300	0	2	N
Big River	Wheeler Gulch 4	2004	463470	351342	0	1	N
Big River	Wheeler Gulch 2	2005	463470	351342	0	1	N
Big River	Wheeler Gulch 1	2005	463790	351448	0	3	N
Big River	Wheeler Gulch 3	2005	463441	351300	0	1	N
Garcia	North Fork Garcia	2008	448836	307241	N	1	3
Navarro East	Wholy 1	1997	463650	336250	0	4	N
Navarro East	Wholy 1	1998	463650	336250	0	1	N
Navarro East	Wholy 2	1997	463300	335550	0	4	N
Navarro East	8-Mile	2000	470251	333780	0	4	N
Navarro East	Rose Creek 1	2001	470120	330414	0	3	N
Navarro East	Rose Creek 2	2001	469940	330786	0	2	N
Navarro East	Rose Creek 1	2002	470120	330414	0	3	N
Navarro East	Rose Creek 2	2002	469940	330786	0	2	N
Navarro West	Dimmick	2000	445427	334158	0	4	N
Navarro West	Flume Gulch	2000	441222	336566	0	4	N
Navarro West	Mouth of Navarro	2000	434554	338663	0	4	6

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
Navarro West	Barton Gulch	2001	441222	336566	0	4	N
Navarro West	Dimmick	2001	445427	334158	0	5	N
Navarro West	Marsh Gulch 1	2001	439441	335420	0	5	N
Navarro West	Marsh Gulch 2	2006	439398	335078	0	1	N
Navarro West	Marsh Gulch 3	2006	439477	335342	0	1	N
Navarro West	Marsh Gulch 4	2006	439480	335140	0	1	N
Navarro West	Marsh Gulch 5	2006	439485	335009	0	1	N
Navarro West	Marsh Gulch 6	2006	439658	334906	0	1	N
Navarro West	Marsh Gulch 7	2006	439732	334939	0	1	N
Navarro West	Marsh Gulch 2	2007	439398	335078	0	1	N
Navarro West	Marsh Gulch 5	2007	439485	335009	0	1	N
Navarro West	Marsh Gulch 3	2007	439477	335342	0	1	N
Navarro West	Marsh Gulch 4	2007	439480	335140	0	1	N
Navarro West	Marsh Gulch 6	2007	439658	334906	0	1	N
Navarro West	Marsh Gulch 7	2007	439732	334939	0	1	N
Navarro West	Marsh Gulch 8	2008	439291	335639	0	2	N
Navarro West	Marsh Gulch 9	2008	439176	335598	0	1	N
Navarro West	Marsh Gulch 10	2008	439115	335600	0	2	N
Navarro West	Marsh Gulch 11	2008	439142	335574	0	1	N
Navarro West	Marsh Gulch 12	2008	439039	335423	1	3	N
Navarro West	Marsh Gulch 13	2008	441387	334310	0	1	N
Navarro West	Marsh Gulch 14	2008	441333	334239	0	2	N
Navarro West	Marsh Gulch 15	2008	441376	334165	0	2	N
Garcia	North Fork Garcia	2008	448836	307241	N	1	3
Navarro West	Navarro (1.1)	2001	437046	338097	0	2	5
Navarro West	Navarro (1.1)	2002	437046	338097	0	2	6
Navarro West	Navarro (1.1)	2008	437046	338097	N	1	2
Navarro West	Navarro (4.2)	2001	441093	336698	0	2	5

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
Navarro West	Navarro (4.2)	2002	441093	336698	0	2	0
Navarro West	Navarro (7.3)	2001	444641	335111	0	2	0
Navarro West	Navarro (7.3)	2002	444641	335111	0	2	2
Navarro West	Lower Navarro 1	2002	444063	335277	0	2	N
Navarro West	Lower Navarro 2	2002	444016	335265	0	3	N
Navarro West	Ray Gulch 1	2002	441904	336203	0	1	N
Navarro West	Ray Gulch 2	2002	441902	336158	0	4	N
Navarro West	Lower Navarro 1	2003	444063	335277	0	1	N
Navarro West	Lower Navarro 2	2003	444026	335265	0	4	N
Navarro West	Ray Gulch 2	2003	441902	336158	0	5	N
Navarro West	Lower Navarro 3	2004	438766	337268	0	2	N
Navarro West	Lower Navarro 4	2004	438798	337285	0	3	N
Navarro West	Lower Navarro 3	2005	438766	337268	0	3	N
Navarro West	Lower Navarro 4	2005	438798	337285	0	2	N
Noyo	McMullen Creek 1	2001	462500	363897	0	5	N
Noyo	Olds Creek 1	2001	453571	363624	0	3	N
Noyo	Olds Creek 2	2001	453136	363473	0	2	N
Noyo	Olds Creek 1	2002	453571	363624	0	2	N
Noyo	Olds Creek 2	2002	453136	363473	0	3	N
Noyo	Olds Creek 1	2003	453571	363473	0	2	N
Noyo	Olds Creek 3	2003	453203	363414	0	3	N
Noyo	Olds Creek 3	2006	453203	363414	0	2	N
Noyo	Olds Creek 4	2006	453625	363591	0	1	N
Rockport	Hardy Creek 1	1995	432185	396571	0	1	N
Rockport	Hardy Creek 2	1995	433063	397039	0	1	N
Rockport	Hardy Creek 3	1995	430913	395718	0	1	N
Rockport	Hardy Creek 1	1996	432185	396571	0	2	N

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
Rockport	Hardy Creek 2	1996	433063	397039	0	1	N
Rockport	Hardy Creek 3	1996	430913	395718	0	1	N
South Coast	Alder 1	1994	444760	317460	232	9	N
South Coast	Alder 2	1994	443940	316360	22	4	N
South Coast	Alder 3	1994	444200	317200	212	8	N
South Coast	Alder 4	1994	445080	317810	28	3	N
South Coast	Elk Creek 1	1994	446040	324152	0	2	N
South Coast	Elk Creek 2	1994	443369	326437	0	2	N
South Coast	Elk Creek 3	1994	444569	325761	0	1	N
South Coast	Greenwood Creek 1	1994	446903	327860	0	1	N
South Coast	Greenwood Creek 2	1994	442052	330969	0	1	N
South Coast	Greenwood Creek 3	1994	445019	330191	0	1	N
South Coast	Greenwood Creek 4	1994	439242	331618	0	1	N
South Coast	Alder 1	1995	444760	317460	48	5	N
South Coast	Alder 2	1995	443940	316360	49	8	N
South Coast	Alder 3	1995	444200	317200	59	7	N
South Coast	Alder 4	1995	445080	317810	26	4	N
South Coast	Alder 1	1996	444760	317460	51	2	N
South Coast	Alder 2	1996	443940	316360	33	2	N
South Coast	Alder 3	1996	444200	317200	46	2	N
South Coast	Greenwood Commons	1996	439220	331630	0	4	N
South Coast	Alder 1	1997	444760	317460	109	4	N
South Coast	Alder 2	1997	443940	316360	62	5	N
South Coast	Alder 3	1997	444200	317200	115	4	N
South Coast	Alder 4	1998	445080	317810	46	5	N
South Coast	Alder 6	1998	447900	318090	0	4	N
South Coast	Alder 7	1998	446410	317430	0	4	N

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
South Coast	Alder 8	1999	445297	316728	0	2	8
South Coast	Barn Gulch	1999	445627	329454	0	5	N
South Coast	Barn Gulch Confluence	1999	446980	328980	0	2	N
South Coast	Greenwood Commons	1999	439220	331630	0	5	N
South Coast	Lower Greenwood Creek	1999	438246	330649	0	5	7
South Coast	Mallo 1.6	1999	444640	321330	0	1	N
South Coast	Mallo Pass 1 <sup>st</sup>	1999	444800	320990	0	2	N
South Coast	Mouth Greenwood Creek	1999	438740	330760	0	1	N
South Coast	Upper Greenwood Creek	1999	445757	4330071	0	3	0
South Coast	Alder 2000	2000	443013	316583	0	4	N
South Coast	Greenwood 2000	2000	438690	331235	0	2	30
South Coast	Greenwood Creek D	2000	439242	331618	0	8	N
South Coast	Alder Creek 3	2001	444200	317200	29	3	N
South Coast	Alder Creek 5	2001	444425	317288	22	3	N
South Coast	Greenwood 4.67	2001	444313	331498	0	2	0
South Coast	Greenwood Creek A	2001	445833	329910	0	2	N
South Coast	Greenwood Creek B	2001	447964	326749	0	1	N
South Coast	Alder 3	2001	444200	317200	19	3	19
South Coast	Lower Greenwood/Morrison	2001	445890	329938	0	1	1
South Coast	Alder 5	2002	444425	317288	10	2	N
South Coast	Lower South Elk 1	2002	440791	326684	3	0	N
South Coast	Lower South Elk 2	2002	440792	326635	2	0	N
South Coast	Lower South Elk 3	2002	439263	328873	0	2	2
South Coast	Lower South Elk 4	2002	439305	328680	0	3	N
South Coast	Lower South Elk 5	2002	439263	328873	N	3	2
South Coast	North Cabin 1	2002	447349	327969	0	3	N
South Coast	North Cabin 2	2002	447585	327442	0	1	N

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
South Coast	North Cabin 3	2002	447286	327891	0	1	N
South Coast	North Cabin 4	2002	447045	327381	0	1	N
South Coast	North Cabin 5	2002	446930	327579	0	4	0
South Coast	West Brushy 1	2002	445964	317383	17	4	N
South Coast	West Brushy 2	2002	445976	317520	67	5	N
South Coast	West Brushy 3	2002	446328	317234	2	1	N
South Coast	West Brushy 4	2002	446334	317005	6	3	N
South Coast	West Brushy 5	2002	446504	317575	N <sup>4</sup>	5	8
South Coast	Alder 8	2002	444082	317406	N	1	11
South Coast	Alder 9	2002	446504	317575	0	4	N
South Coast	Alder 10	2003	444425	317288	52	1	N
South Coast	Alder 11	2003	441615	316247	10	1	N
South Coast	Alder 12	2003	443897	316848	53	1	N
South Coast	Alder 13	2003	444604	317377	0	2	N
South Coast	Alder 14	2003	442126	316358	5	1	N
South Coast	Alder 15	2003	441253	316409	N	2	67
South Coast	Alder 16	2003	444069	317173	N	2	11
South Coast	Irish Gulch 1	2003	444272	317974	5	4	N
South Coast	Irish Gulch 2	2003	443989	318065	0	1	N
South Coast	Mills Creek 1	2003	442484	321704	0	5	N
South Coast	North Cabin 3	2003	447286	327891	0	1	N
South Coast	North Cabin 5	2003	447430	327978	0	2	N
South Coast	North Cabin 6	2003	447457	327862	0	2	N
South Coast	West Brushy 2	2003	445976	317520	43	8	N
South Coast	West Brushy 5	2003	446504	317575	N	2	4
South Coast	West Brushy 6	2003	445908	317199	0	1	N

<sup>4</sup> MRC did not complete ground surveys in this location in this year.

Murrelet Surveys							
Tract	Site	Year	UTME <sup>1</sup>	UTMN	Ground Detections	# Surveys	Radar Detections <sup>2</sup>
South Coast	Irish Gulch 1	2004	444272	317974	3 <sup>5</sup>	3	N
South Coast	Irish Gulch 2	2004	443989	318065	0	2	N
South Coast	Mills Creek 1	2004	442484	321704	0	1	N
South Coast	Mills Creek 2	2004	442448	321643	0	4	N
South Coast	Alder 17	2004	441150	316607	N	2	50
South Coast	Alder 18	2004	444068	317414	N	2	24
South Coast	West Brushy 5	2004	446504	317575	N	2	1
South Coast	Alder 18	2005	444068	317414	N	2	50
South Coast	Alder 19	2005	441253	316409	N	2	50
South Coast	West Brushy 5	2005	446504	317575	N	2	1
South Coast	Alder 15	2008	441253	316409	N	5	57
South Coast	Alder 16	2008	444069	317173	N	5	14
South Coast	Owl Creek 1	2008	442873	316721	0	5	N
South Coast	Owl Creek 2	2008	442925	316788	0	5	N

<sup>5</sup> The detections from the “Irish Gulch 1” survey were actually murrelets flying in LACMA.

## L.2 Radar surveys in LACMA

In 2003-2005, MRC and Hamer Environmental completed radar surveys in LACMA to assess variability within annual murrelet detections. With the 2003-2005 data, we estimated the number of surveys required to detect a difference in the annual number of murrelet detections (M§13.9.2.1-1 and M§13.9.2.1-2). Near the mouth of Alder Creek, for instance, a mean of 33.5 murrelets were detected in 2003, while a mean of 25 murrelets were detected in 2004. By understanding the level of variance in detections, we can determine whether differences in the means represent a true difference from year to year or whether there is a great variation in the number of detections at the same sites within and across years. MRC also conducted radar surveys in Lower Alder Creek in 2007 and 2008. However, we did not include the 2007 and 2008 data in our analysis since it only represented 2 consecutive years.

We assessed our initial power and the required number of samples to meet a certain objective (see 13.2.2.4). In making comparison, we would want a power of 0.90 (i.e., the likelihood of detecting a difference when there actually is one) and an alpha level of 0.10 (i.e., the likelihood of rejecting a hypothesis when it is false). For this and all statistical studies, our goal is to balance increased power with decreased alpha level.

To assess power level in 2003-2005, we used a power calculator accessed through the UCLA statistics website (Brown 2006). This calculator uses a t-test with Welch's approximation for the degrees of freedom to estimate power and required sample sizes. We compared the 2 marbled murrelet radar sites separately. This analysis was based on only 2 surveys at each site in each year – a very limited number to complete a power analysis and estimate standard deviation. Site 1 was near the mouth of Alder Creek and Site 2 was at the rock quarry. The tables below show the comparisons between 2003, 2004, and 2005 for each of the sites and a projection of required surveys to achieve a power of 0.90 and alpha of 0.10.

**Table L-2 Detections, Means, and Standard Deviation at Survey Site 1**

	Survey Years		
	2003	2004	2005
Means	33.5	25.0	25.0
Standard deviation	3.5	1.4	4.2
Number of surveys	2	2	2

**Table L-3 Power and Survey Comparison at Site 1 by Survey Year**

	Survey Years		
	2003-2004	2004-2005	2003-2005
Current power	0.772	NA*	0.658
Sample size to meet power = 0.9	6	NA*	4
Sample size to meet power = 0.8	6	NA*	4

**TABLE NOTES**

\* Initially, the means are equal so power calculations are not applicable.



**Table L-4 Detections, Means, and Standard Deviation at Survey Site 2**

	Survey Years		
	2003	2004	2005
Means	5.5	12.0	2.0
Standard deviation	2.1	8.5	1.4
Number of surveys	2	2	2

**Table L-5 Power and Survey Comparison at Site 2 by Year**

	Survey Years		
	2003-2004	2004-2005	2003-2005
Current power	0.283	0.402	0.574
Sample size to meet power = 0.9	15	13	5
Sample size to meet power = 0.8	10	13	4

Tables L2 through L5 indicate that we would require from 4-15 surveys per site to meet our power and alpha-level goal and to assess differences in murrelet detections from year to year. While this analysis is informative, we believe it may underestimate the number of surveys required since (1) only 2 sites per year were surveyed in each case and (2) our survey effort in 2003-2005 was not consistent in timing and location. Our pilot study from 2010-2011 will determine whether we can confidently compare murrelet trends with 5 surveys at 2 sites. If not, we may concentrate on 10 surveys at Site 1 (the mouth of Alder Creek). Since Site 1 generally has more murrelet detections and generally has less variation in numbers of detections, there is a greater likelihood of detecting differences in annual murrelet trends with limited effort. Our initial analysis suggests that we will not be able to lump data from Site 1 and Site 2 for a year-to-year comparison. However, we believe it is important to continue to monitor Site 2 because of its proximity to occupied stands in Alder Creek.

### **L.3 Lower Alder Creek Management Area (LACMA) Map**

The map labeled Figure L-1 defines the boundaries of LACMA in the Lower Alder Creek planning watershed. The map shows the locations of trees occupied by murrelets and an eggshell fragment found in 1993.

### **L.4 Marbled Murrelet Survey Protocol**

MRC will use the most current version of the Pacific Seabird Group (PSG) protocol for murrelet surveys, updated over the term of the HCP/NCCP by PSG or the wildlife agencies. This protocol was developed for terrestrial surveys for marbled murrelets; the protocol is for both land management and research purposes. The most recent version of the PSG protocol was published in 2003 (Evans Mack et al. 2003). We use this version with guidance from the wildlife agencies and with certain enhancements for surveys within LACMA. For this HCP/NCCP, we will add certain enhancements (section 10.3.2.1.2) for surveys within LACMA.

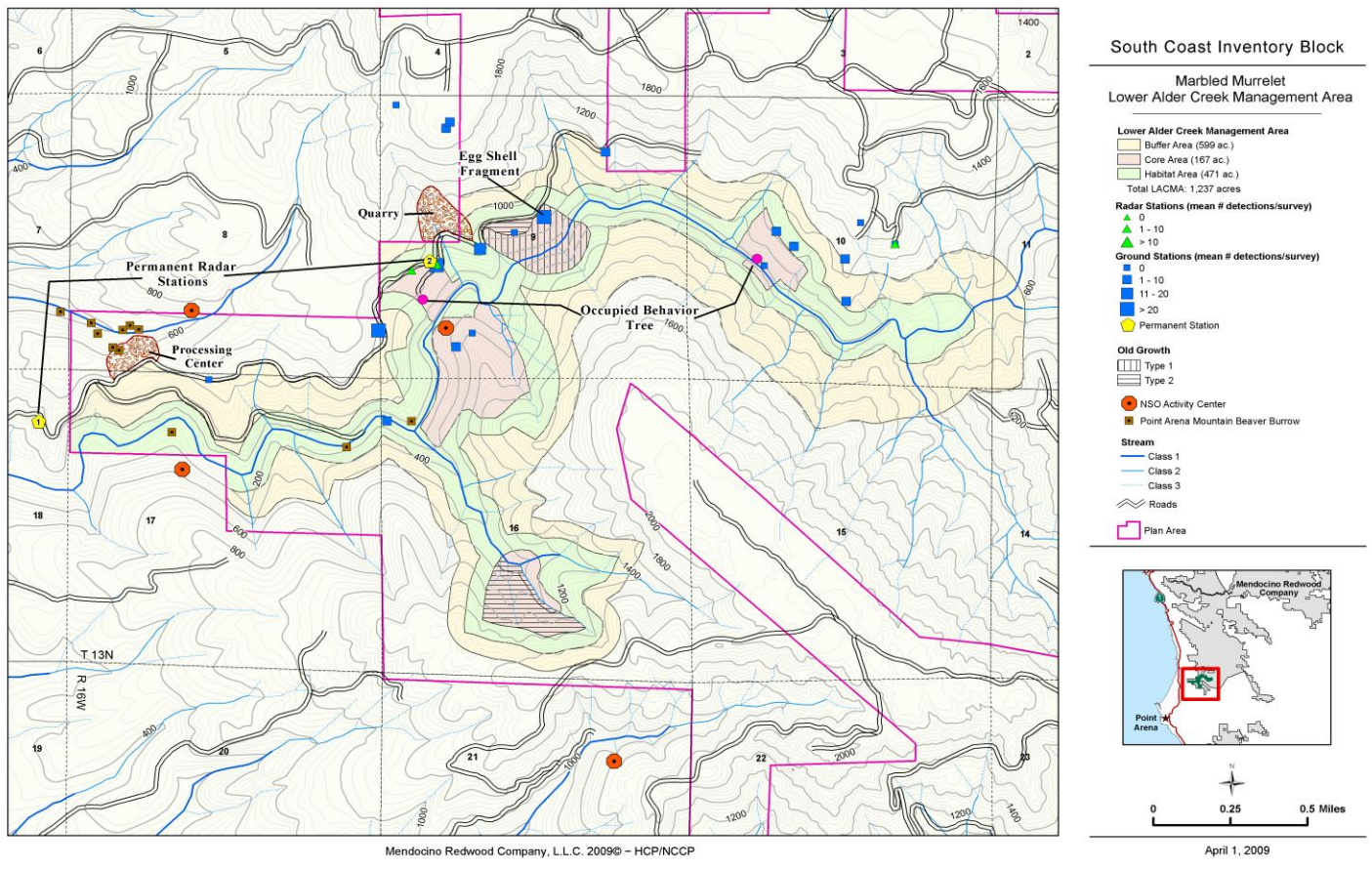


Figure L-1 LACMA Map