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August 6, 2001

California Dept. of Fish and Game  
Attn: Esther Burkett (HCPB)  
1416 Ninth St  
Sacramento, CA 95814

**RE: 2001 Marbled Murrelet Monitoring Surveys at Big Basin and Portola State Parks.**

Dear Esther,

Enclosed you will find the data from the various surveys at Big Basin Redwoods State Park and Portola Redwoods State Park. Following is a brief summary of the results. I have also included a summary of murrelet activity at the Redwood Meadow / Park Headquarters area using data (mostly my own) from 1991-2001.

**Big Basin Redwoods State Park**

Three protocol-level dawn surveys were conducted at each of the five monitoring stations between June 18 and July 18, 2001. Survey dates were: June 18, July 3 and July 18 at Redwood Meadow; June 20, July 2 and July 18 at 100 Acre Woods; June 19, July 3 and July 17 at Blooms Creek; June 20, July 2 and July 16 at Huckleberry Tent #17; and June 20, July 4 and July 17 at Sempervirens. Additional surveys were conducted by Suddjian at Redwood Meadow that were not part of this contract.

David L. Suddjian, Bryan M. Mori and Jeff N. Davis conducted all surveys. Weather conditions were clear for all surveys on June 18-20 and July 2-4, but foggy on all four of five surveys July 16-18 (Table 1).

In addition to the dawn murrelet survey data, we also recorded all bird species detected (noting time, vocalizations and other pertinent information), and conducted two point counts during each survey. The point counts were 10-min. duration, unlimited distance, beginning at 5 and 45 minutes after sunrise. Details of the detections of Common Ravens and raptors were recorded separately, and we also made a best estimate of the maximum number of Steller's Jays recorded during each survey.

## *Summary of findings*

Marbled Murrelet. Murrelet activity is summarized on Table 1. Activity was low overall and low compared to previous years, except for high activity on one survey at Redwood Meadow. Table 2 compares numbers of all detections and detections with “occupied behavior” between years. Occupied behavior was particularly infrequent in 2001. The only particularly interesting detections were a series of tree landings at Blooms Creek on July 3 (but not pertaining to active nesting), and an extremely low flying individual at Redwood Meadow on July 18.

Seventy-nine additional protocol-level dawn surveys were conducted at the Redwood Meadow and adjacent Park Headquarters parking lot from 1991 to 2001 (D. Suddjian pers. obs.). Together with the 20 surveys sponsored by CDFG in 1995-1998 and 2001, a total of 99 surveys were conducted at these two stations (Table 3). The two are adjacent to each other, only 70 meters apart, and they sample largely the same activity (D. Suddjian pers. obs.). Both have had very high activity (formerly) typical of the Redwood Loop Trail area, and both have had many occupied behavior detections on given mornings. Auditory detections overlap broadly between the two stations because they are so close together. Thus, it is valid to combine survey results from these two spots to provide a look at a long-term trend in murrelet activity in the headquarters area.

Murrelet activity has declined significantly from 1991 to the present as measured by these dawn surveys at the Redwood Meadow and Park HQ area (Figures 1, 2 and 3). Spearman Rank correlations for average total detections, average occupied detections, and median total detections all showed highly significant negative trends ( $r = -0.94$ ,  $-0.96$  and  $-0.97$  respectively, all  $p < 0.001$ ). The graphs show the most dramatic decline occurred from 1995 to the present. Although there are concerns about how to interpret changes in this sort of survey data, and there are high levels of variance in the data, it is plain that something has changed and is changing over the years. The importance of this change is increased when one considers that the Redwood Loop / Park Headquarters area was long considered to be one of the most active spots (perhaps even the premier spot) for murrelets in the Santa Cruz Mountains region.

## Corvids

Steller’s Jay was detected at all stations on all surveys. Numbers were highest at Huckleberry #17 and Blooms Creek (Table 4). Counts of up to 27 jays during point counts at Huckleberry many birds mobbing of a Cooper’s Hawk, but numbers were obviously very high in that campground.

Common Ravens were detected at all stations except Sempervirens (Table 4). Numbers ranged from 0-15 per survey, with highest counts at Blooms Creek (13-15 birds) and Redwood Meadow (6 birds). Observations made during and outside dawn survey periods indicated that at least five family groups were present in the study area, all fledging in

late June. Details of observations during the surveys are given on the "Common Raven Observation Form" attached to each survey's murrelet data.

Human food was observed to be commonly available to corvids in the campgrounds, including food that was left out, food containers opened by corvids or western gray squirrels, and spilled garbage. Spilled garbage cans were observed on nearly every visit to the park store area, Opal Creek picnic area, Blooms Creek campground and Huckleberry Campground.

### Raptors

Details of all raptor detections are given on the forms labeled "List of Birds Recorded During MAMU Survey", and on other attached notes (see also Table 4).

Sharp-shinned Hawk was detected at Bloom's Creek, where a family group of fledged young was present from June 19 to July 17.

Cooper's Hawk was heard giving alarm calls at Bloom's Creek on June 19, and an adult female was seen carrying a Steller's Jay at Huckleberry #17 on July 2.

Red-shouldered Hawk was heard from Redwood Meadow on June 18.

Peregrine Falcon was heard and seen at Blooms Creek on June 19 and July 17, and heard near the Blooms Creek Campground on July 16 and 17.

### **Portola Redwoods State Park**

Protocol-level dawn murrelet surveys were conducted on three successive mornings from June 28-30, 2001, matching efforts in previous years when three surveys also occurred in very late June or very early July. D. L. Suddjian conducted all surveys. In addition to the murrelet survey data, other information was gathered as described above for Big Basin.

#### *Summary of findings*

Marbled Murrelet. Murrelet activity at Portola in 2001 is summarized on Table 5. Activity was similar overall to previous years, although I only had data from 1992-1995. Data from subsequent years was not provided for my review. Table 6 compares numbers of all detections and detections with "occupied behavior" between years.

Numbers of detections (55, 99 and 83) and especially of detections with occupied behavior (4, 16 and 49) varied greatly among the three days. Much of the variation in numbers of occupied behaviors was due to progressively lower fog ceilings over the three dates (Figure 4).

Four interesting detections on June 30 included three landings in different trees (none apparently involving a nest, though), and an observation of a single murrelet flying up Peter's Creek carrying a fish in its bill. Details are given on the attached data forms.

### Corvids

Steller's Jays were detected on all three surveys (Table 7), with estimates of maximum numbers ranging from 8-14 jays. The same family group of Common Ravens was detected on all three days (Table 7), including two adults and four juveniles. These spent long periods of time in the vicinity of the survey station and nearby campground. Adults were regularly seen foraging successfully in the campground. Food was available at campsites, but no spilled garbage was observed. Portola has animal-proof garbage cans.

### Raptors

A male Sharp-shinned Hawk was seen flying up Peter's Creek on June 30. A Red-shouldered Hawk was heard northwest of the station on the June 30 survey, and a pair was otherwise heard in that area and near park headquarters on June 28-30.

An adult male Peregrine Falcon was heard wailing north of the station on the June 29 survey, and seen flying south over the creek near the end of the survey. On June 30 he was heard again far to the north-northeast of the station. Some suitable nesting cliffs occur in the upper Peter's Creek watershed near Devil's Canyon, but these have apparently never been checked for nesting falcons (J. Linthicum pers. comm.).

\* \* \*

Please contact me if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. L. Suddjian', written in a cursive style.

David L. Suddjian  
Wildlife Biologist

Table 1. Summary of dawn murrelet surveys conducted for the California Dept. of Fish and Game at Big Basin Redwoods State Park from June 18 – July 18, 2001

Station	Date	Obs.	Cloud Cover	Precip.	Total # Dets.	# OB <sup>1</sup> Dets.
Redwood Meadow	18 June 01	DLS	0%	None	6	3
Redwood Meadow	3 July 01	DLS	0-30%	None	22	5
Redwood Meadow	18 July 01	DLS	100%	Fog	231	16
100 Acre Woods	20 June 01	DLS	0%	None	9	0
100 Acre Woods	2 July 01	BMM	0%	None	1	1
100 Acre Woods	18 July 01	JND	0%	None	1	1
Blooms Creek	19 June 01	DLS	0%	None	25	0
Blooms Creek	3 July 01	BMM	0-50%	None	18	9
Blooms Creek	17 July 01	DLS	100%	Fog	25	0
Huckleberry #17	20 June 01	BMM	0%	None	0	0
Huckleberry #17	2 July 01	DLS	0%	None	6	0
Huckleberry #17	16 July 01	BMM	100%	Fog	7	0
Sempervirens	20 June 01	JND	0%	None	0	0
Sempervirens	4 July 01	DLS	0%	None	0	0
Sempervirens	17 July 01	BMM	100%	Fog	3	0

1. OB = detections with “occupied site” behavior (i.e., below canopy flight or tree interactions).

Table 2. Comparison of activity levels between years at the five Big Basin stations.

Station	Year	N	<i>All Detections</i>		<i>Occupied Site Detections</i>	
			Avg # Dets.	S.D.	Avg # Dets.	S.D.
Redwood Meadow	1995	4	177.0	102.3	64.0	69.5
	1996	4	97.0	19.0	27.5	11.6
	1998	4	92.3	54.0	33.5	31.8
	2001	3	86.3	125.5	8.0	7.0
100 Acre Woods	1995	4	25.3	20.7	9.0	9.4
	1996	4	9.5	7.1	2.0	2.4
	1998	4	5.0	4.4	3.7	3.5
	2001	3	3.7	4.6	0.3	0.6
Blooms Creek	1995	4	44.8	42.5	1.5	2.4
	1996	4	44.8	27.0	1.8	2.2
	1998	4	15.0	14.5	1.0	1.4
	2001	3	23.0	4.4	3.0	5.2
Huckleberry #17	1995	4	24.3	18.1	7.5	9.3
	1996	4	23.3	25.1	5.5	9.7
	1998	4	14.0	9.9	1.0	0.8
	2001	3	4.3	3.8	0.0	0.0
Sempervirens	1995	4	1.3	1.9	0.3	0.5
	1996	4	4.8	7.5	0.0	0.0
	1998	4	5.3	8.6	0.3	0.5
	2001	3	1.0	1.7	0.0	0.0
All 5 Stations Combined	1995	20	54.5	78.8	16.5	37.4
	1996	20	35.9	38.4	7.4	12.2
	1998	20	27.4	41.9	8.1	18.8
	2001	15	23.7	58.1	2.3	4.6

Note: This table only presents data from CDFG sponsored surveys, and for comparative purposes only uses data from the period May 14 – July 23 is presented (i.e., some data from the very end of July and beginning of August is excluded). Data from additional non-CDFG sponsored surveys is not shown.



Table 3. Summary of dawn murrelet survey results from Redwood Meadow and Park Headquarters Parking Lot, Big Basin Redwoods State Park, 1991-2001.<sup>1</sup>

Date	Observer	Location	Precip.	% Cover	# Total # Dets.	# OB <sup>2</sup> Dets.
4/12/91	D. Suddjian	Redwood Meadow	None	0-50	147	33
4/22/91	D. Suddjian	Redwood Meadow	Fog	50-100	204	81
5/15/91	D. Suddjian	HQ Parking Lot	None	0	131	31
5/16/91	D. Suddjian	Redwood Meadow	None	0	108	22
5/18/91	D. Suddjian	HQ Parking Lot	Fog	100	192	112
6/2/91	D. Suddjian	Redwood Meadow	None	0	119	21
6/19/91	D. Suddjian	Redwood Meadow	Fog	100	177	63
7/4/91	D. Suddjian	Redwood Meadow	Fog/Driz	100	303	149
7/20/91	D. Suddjian	Redwood Meadow	Fog/Driz	100	267	108
4/15/92	D. Suddjian	Redwood Meadow	None	30-75	97	29
4/17/92	D. Suddjian	HQ Parking Lot	Fog	0-100	165	56
4/28/92	D. Suddjian	Redwood Meadow	None	0-25	137	33
4/29/92	D. Suddjian	HQ Parking Lot	None	0	159	39
4/30/92	D. Suddjian	Redwood Meadow	None	0	96	21
5/16/92	D. Suddjian	Redwood Meadow	Fog	100	192	69
6/6/92	D. Suddjian	Redwood Meadow	Fog	100	208	40
6/30/92	D. Suddjian	Redwood Meadow	None	0	151	30
7/8/92	D. Suddjian	HQ Parking Lot	Fog	100	219	93
7/11/92	D. Suddjian	Redwood Meadow	Fog/Driz	100	244	131
7/24/92	D. Suddjian	Redwood Meadow	Fog	100	186	82
4/13/93	D. Suddjian	Redwood Meadow	None	75-100	109	19
4/14/93	D. Suddjian	Redwood Meadow	None	50-100	131	35
4/15/93	D. Suddjian	HQ Parking Lot	Fog	100	184	47
4/16/93	D. Suddjian	Redwood Meadow	Fog/Driz	100	160	42
4/22/93	D. Suddjian	Redwood Meadow	Fog/Driz	100	191	68
5/20/93	D. Suddjian	Redwood Meadow	Fog	50-100	116	20
6/19/93	D. Suddjian	Redwood Meadow	Fog	100	99	22
7/10/93	D. Suddjian	Redwood Meadow	Fog	100	210	88
7/19/93	D. Suddjian	Redwood Meadow	Fog	100	305	147
4/5/94	D. Suddjian	Redwood Meadow	None	0-25	82	18
4/6/94	D. Suddjian	HQ Parking Lot	None	0-50	130	32
4/7/94	D. Suddjian	Redwood Meadow	None	0	107	21
5/15/94	D. Suddjian	Redwood Meadow	Fog	100	158	42
6/20/94	D. Suddjian	Redwood Meadow	None	0	109	17
7/17/94	D. Suddjian	Redwood Meadow	Fog	100	246	65
7/25/94	D. Suddjian	HQ Parking Lot	Fog	100	184	54
4/12/95	D. Suddjian	Redwood Meadow	None	0	100	29
4/13/95	D. Suddjian	Redwood Meadow	None	100	181	35
4/14/95	D. Suddjian	Redwood Meadow	None	0	138	29
4/17/95	D. Suddjian	Redwood Meadow	Fog	100	220	71
4/18/95	D. Suddjian	HQ Parking Lot	None	50-90	145	37
4/19/95	D. Suddjian	Redwood Meadow	None	60-90	110	20

Table 3 Cont.

5/14/95	E. Burkett	Redwood Meadow	None	50-100	110	10
6/20/95	M. Faulhaber	Redwood Meadow	None	0	107	38
7/3/95	C. Weygandt	Redwood Meadow	Fog/Driz	100	325	166
7/19/95	S. Singer	Redwood Meadow	None	85-90	166	42
7/31/95	M. Faulhaber	Redwood Meadow	None	0	119	11
4/16/96	D. Suddjian	Redwood Meadow	None	0	118	29
5/2/96	D. Suddjian	Redwood Meadow	None	0	116	17
5/22/96	E. Burkett	Redwood Meadow	Fog/Driz	95-100	117	44
6/13/96	B. Webb	Redwood Meadow	None	75-100	107	27
7/3/96	J. Spickler	Redwood Meadow	None	0-15	74	20
7/19/96	E. Burkett	Redwood Meadow	None	0	90	19
7/31/96	E. Burkett	Redwood Meadow	None	0	46	4
4/8/97	D. Suddjian	HQ Parking Lot	None	50-100	119	37
4/24/97	D. Suddjian	Redwood Meadow	None	0	144	21
4/27/97	D. Suddjian	Redwood Meadow	Fog	100	186	40
5/20/97	D. Suddjian	Redwood Meadow	None	50-75	104	16
6/14/97	D. Suddjian	Redwood Meadow	Fog/Driz	100	235	59
6/15/97	D. Suddjian	Redwood Meadow	Fog	100	163	27
6/16/97	D. Suddjian	Redwood Meadow	None	0	110	21
7/4/97	P. Cole	Redwood Meadow	None	0	62	5
7/14/97	D. Suddjian	Redwood Meadow	Fog	100	111	24
7/19/97	E. Burkett	Redwood Meadow	None	0	82	17
7/23/97	D. Suddjian	Redwood Meadow	Fog/Driz	100	190	45
4/28/98	D. Suddjian	Redwood Meadow	Fog	0	76	19
5/23/98	M. Casupanan	Redwood Meadow	Fog/Driz	100	72	28
6/17/98	L. Patterson	Redwood Meadow	Fog	0-100	61	14
7/3/98	L. Patterson	Redwood Meadow	None	100	173	80
7/17/98	M. Casupanan	Redwood Meadow	None	0	63	12
6/20/98	D. Suddjian	Redwood Meadow	None	75-90	37	6
7/10/98	D. Suddjian	Redwood Meadow	None	0	81	7
7/22/98	D. Suddjian	Redwood Meadow	Fog/Driz	100	135	32
8/1/98	L. Patterson	Redwood Meadow	None	0	9	1
4/19/99	D. Suddjian	HQ Parking Lot	Fog	50-100	40	8
4/27/99	D. Suddjian	Redwood Meadow	None	0-25	46	5
5/25/99	D. Suddjian	Redwood Meadow	None	0	39	5
6/15/99	D. Suddjian	HQ Parking Lot	Fog	100	83	6
7/10/99	D. Suddjian	Redwood Meadow	Fog	100	74	12
7/25/99	D. Suddjian	HQ Parking Lot	Fog	100	66	5
4/21/00	D. Suddjian	Redwood Meadow	Fog	100	13	0
4/25/00	D. Suddjian	HQ Parking Lot	Fog	100	18	2
5/9/00	D. Suddjian	HQ Parking Lot	Fog	100	55	3
5/27/00	D. Suddjian	Redwood Meadow	Fog	100	39	7
6/19/00	D. Suddjian	Redwood Meadow	Fog/Driz	100	68	12
7/6/00	D. Suddjian	HQ Parking Lot	Fog	100	75	6
7/7/00	D. Suddjian	Redwood Meadow	Fog	100	75	5
7/8/00	D. Suddjian	HQ Parking Lot	Fog	100	120	8



Table 3 cont.

7/10/00	D. Suddjian	Redwood Meadow	Fog/Driz	100	160	45
7/25/00	D. Suddjian	Redwood Meadow	Fog	100	44	5
4/25/01	D. Suddjian	Redwood Meadow	None	0	12	1
5/21/01	D. Suddjian	HQ Parking Lot	None	0	15	2
5/28/01	D. Suddjian	Redwood Meadow	Fog	100	29	3
6/18/01	D. Suddjian	Redwood Meadow	None	0	6	3
6/24/01	D. Suddjian	Redwood Meadow	Fog	100	5	0
7/3/01	D. Suddjian	Redwood Meadow	None	0-30	22	5
7/8/01	D. Suddjian	Redwood Meadow	Fog	100	29	4
7/18/01	D. Suddjian	Redwood Meadow	Fog	100	231	16
7/22/01	D. Suddjian	Redwood Meadow	Fog	100	19	4

1. Data from D. Suddjian (pers. obs.) and CDFG sponsored surveys.
2. OB = detections with "occupied site" behavior (i.e., below canopy flight or tree interactions).

Table 4. Birds Recorded During the Dawn Surveys at Five Marbled Murrelet Monitoring Stations, Big Basin Redwoods State Park, June 18 to July 18, 2001.

Species	Redwood Meadow	100 Acre Woods	Blooms Creek	Huckleberry #17	Sempervirens
	Pt 2hr Cnt	Pt 2hr Cnt	Pt 2hr Cnt	Pt 2hr Cnt	Pt 2hr Cnt
Sharp-shinned Hawk			X 2		
Cooper's Hawk			X 1	X -- <sup>1</sup>	
Red-shouldered Hawk	X 1				
Peregrine Falcon			X --		
Marbled Murrelet <sup>2</sup>	X 11	X 6	X 4	X --	X --
Band-tailed Pigeon	X 5	X 1	X 2	X 1	X 2
Mourning Dove			X 2	X --	
Western Screech-Owl		X --	X --		X --
Northern Pygmy-Owl	X	X --			
Northern Saw-whet Owl			X --		
Vaux's Swift	X 4		X 1	X 2	
Allen's Hummingbird			X --	X --	
Belted Kingfisher			X --		
Acorn Woodpecker	X 16	X 1	X 13	X 13	X 6

Table 4, cont.

Species	Redwood Meadow	100 Acre Woods	Blooms Creek	Huckleberry #17	Sempervirens
	Pt 2hr Cnt	Pt 2hr Cnt	Pt 2hr Cnt	Pt 2hr Cnt	Pt 2hr Cnt
Hairy Woodpecker	X --	X 1	X 1	X 4	X 1
Northern Flicker	X 1	X 2	X 3	X 2	X --
Pileated Woodpecker	X 2	X 2	X 6	X 2	
Pacific-slope Flycatcher	X 3	X 5	X --	X 1	X 4
Hutton's Vireo	X 1	X --	X 3	X --	X --
Warbling Vireo	X 2	X 1	X --		X 3
Steller's Jay	X 7	X 6	X 10	X 28!!	X 3
Common Raven	X 5	X 2	X 4	X 2	
Chestnut-backed Chickadee	X 4	X 2	X 6	X 4	X 3
Pygmy Nuthatch	X 7	X 2	X 5	X 3	X 3
Brown Creeper	X 4	X 3	X 3	X 3	X 4
Winter Wren	X 2	X 3	X 2	X 1	X 2
Golden-crowned Kinglet	X 2	X 1	X 1	X 1	X 2
Varied Thrush		X 1			
American Robin	X 4	X 1	X 3	X 2	X 3
Swainson's Thrush	X 1				

Table 4, cont.

Species	Redwood Meadow		100 Acre Woods		Blooms Creek		Huckleberry #17		Sempervirens	
	Pt	2hr Cnt	Pt	2hr Cnt	Pt	2hr Cnt	Pt	2hr Cnt	Pt	2hr Cnt
Hermit Thrush	X	2	X	3	X	3	X	1	X	3
Wrentit	X	--			X	1				
Hermit Warbler			X	--	X	2				
Wilson's Warbler	X	1			X	3	X	3	X	1
Spotted Towhee	X	1			X	2	X	4		
Black-headed Grosbeak	X	--			X	--				
Dark-eyed Junco	X	3	X	--			X	1	X	1
Purple Finch	X	1	X	1						
Pine Siskin	X	1								
Total Species (2 hr surveys) <sup>3</sup>		29		24		32		24		19
Total Species (Point counts) <sup>4</sup>		25		19		24		19		15
Total Individuals (Point counts) <sup>5</sup>		91		44		83		78		41

1 Species detected during a 2-hour survey, but not detected during point count.  
 2 Best estimate of number of murrelets from multiple detections.  
 3 Cumulative species detected from 3 dawn surveys.  
 4 Cumulative species detected from 6 10-min. point counts (2 on each of 3 days)  
 5 Cumulative individuals from high counts from all 6 point counts per station.

Table 5. Summary of dawn murrelet surveys conducted for the California Dept. of Fish and Game at Portola Redwoods State Park from June 28 – June 30, 2001

Station	Date	Obs.	Cloud Cover	Precip.	Total # Dets.	# OB <sup>1</sup> Dets.
Peter's Creek Bridge	28 June 01	DLS	0-100%	Fog	55	4
Peter's Creek Bridge	29 June 01	DLS	100%	Fog	99	16
Peter's Creek Bridge	30 June 01	DLS	25-100%	Fog	83	39

3. OB = detections with "occupied site" behavior (i.e., below canopy flight or tree interactions).

Table 6. Comparison of activity levels between years at the Portola station.

Station	Year	N	<i>All Detections</i>		<i>Occupied Site Detections</i>	
			Avg # Dets.	S.D.	Avg # Dets.	S.D.
Peters Creek Bridge	1992	3	40.7	12.1	4.0	2.6
	1993	3	71.3	7.6	3.0	2.6
	1994	3	167.3	36.1	8.0	2.0
	1995	3	80.0	19.1	17.3	20.5
	2001	3	79.0	22.3	19.7	18.8

Table 7. Birds Recorded During the Dawn Surveys at Peter's Creek Bridge, Portola Redwoods State Park, June 28-30, 2001

	<i>High Count From</i>			<i>Notes</i>	
	<i>6/28</i>	<i>6/29</i>	<i>6/30</i>		
Common Merganser	X			1	
Sharp-shinned Hawk			X	*	female flew over twice
Red-shouldered Hawk			X	1	ad. male flies through forest canopy calls to northwest
Peregrine Falcon		X	X	1	wail calls, and seen flying over
Marbled Murrelet	X	X	X	13**	1 carrying fish, flying up creek 6/30
Band-tailed Pigeon	X	X	X	5	
Vaux's Swift	X	X	X	1	
Allen's Hummingbird	X	X	X	2	pair nesting in chimney at visitor ctr
Belted Kingfisher	X		X	1	
Acorn Woodpecker	X	X	X	8	
Hairy Woodpecker	X	X	X	3	
Northern Flicker		X	X	*	
Pileated Woodpecker	X	X	X	2	up to 3 heard during 2 hr survey
Pacific-slope Flycatcher	X	X	X	3	
Hutton's Vireo	X	X	X	1	
Steller's Jay	X	X	X	13	
Common Raven	X	X	X	6	
Chestnut-backed Chickadee	X	X	X	4	family group with 4 juv.
Pygmy Nuthatch	X	X	X	6	
Brown Creeper	X	X	X	5	
Winter Wren	X	X	X	3	
Golden-crowned Kinglet	X	X	X	2	
Varied Thrush		X	X	*	
American Robin	X	X	X	4	
Hermit Thrush	X	X	X	1	
European Starling	X	X	X	3	ad. and juv. from local nest



Table 7, cont.

	High Count From			Notes
	6/28	6/29	6/30	
Wilson's Warbler	X	X	X	1
Black-headed Grosbeak		X		*
Dark-eyed Junco	X	X	X	2
Brewer's Blackbird		X		3
Purple Finch	X			*
Red Crossbill		X		*
Pine Siskin			X	*

\* Species detected during a 2-hour survey, but not detected during point count.

\*\* Best estimate of number of murrelets from multiple detections.

flying over, unusual here?

flying over once

flying over once

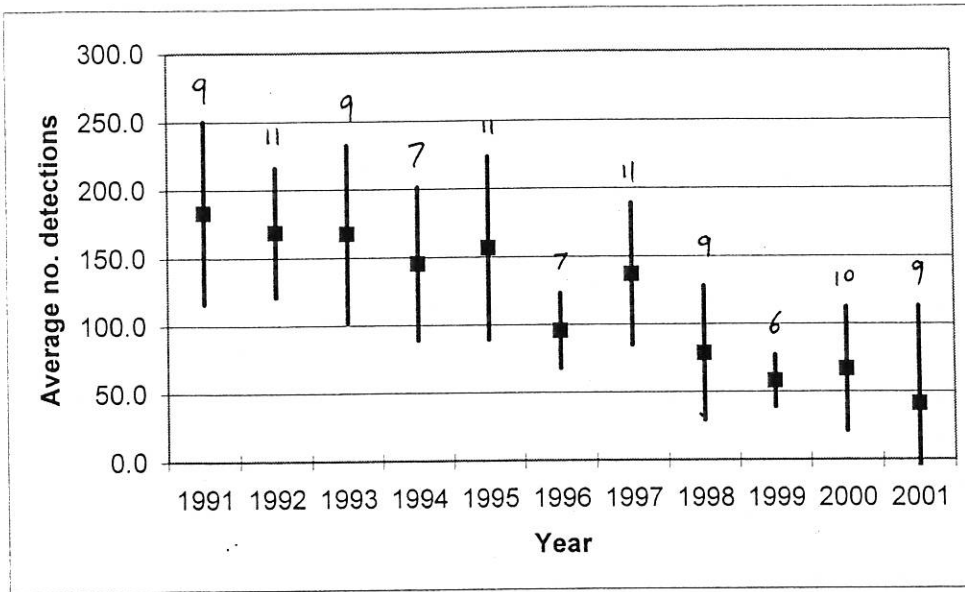


Figure 1. Average number of detections ( $\pm$  s.d) on dawn surveys at Redwood Meadow and Park HG, 1991-2001. Sample size is given above each year. Surveys occurred between April 5 and August 1 each year.

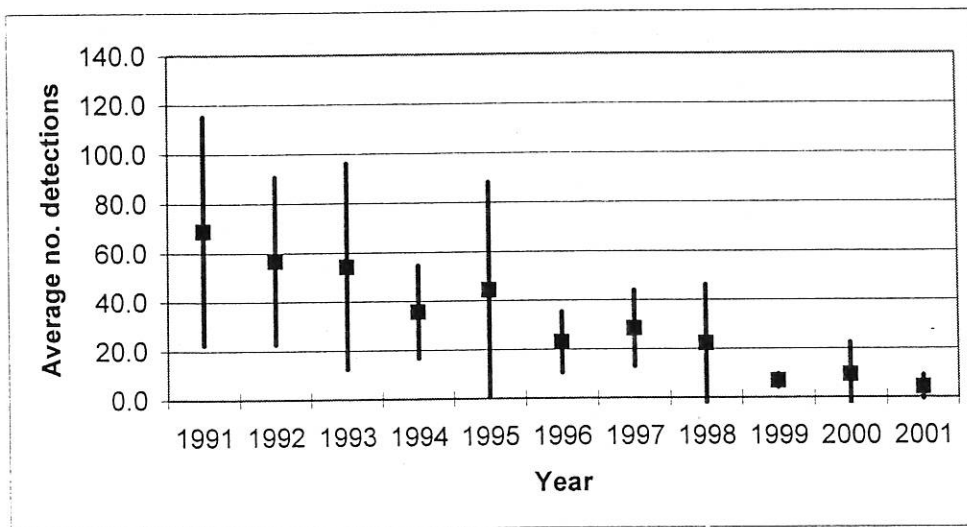


Figure 2. Average number of occupied behavior detections ( $\pm$  s.d) on dawn surveys at Redwood Meadow and Park HG, 1991-2001. See Figure 1 for sample size. Surveys occurred between April 5 and August 1 each year.

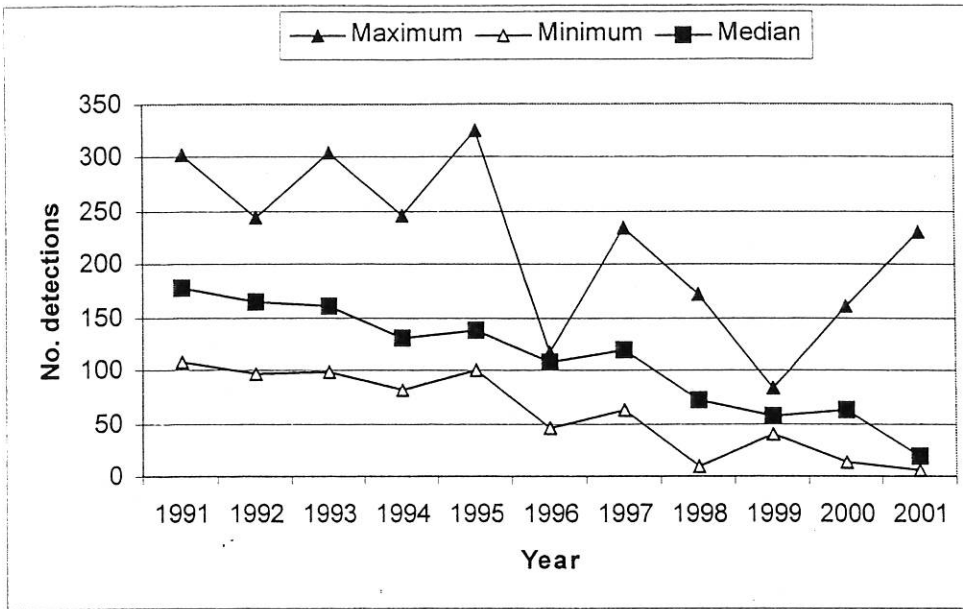
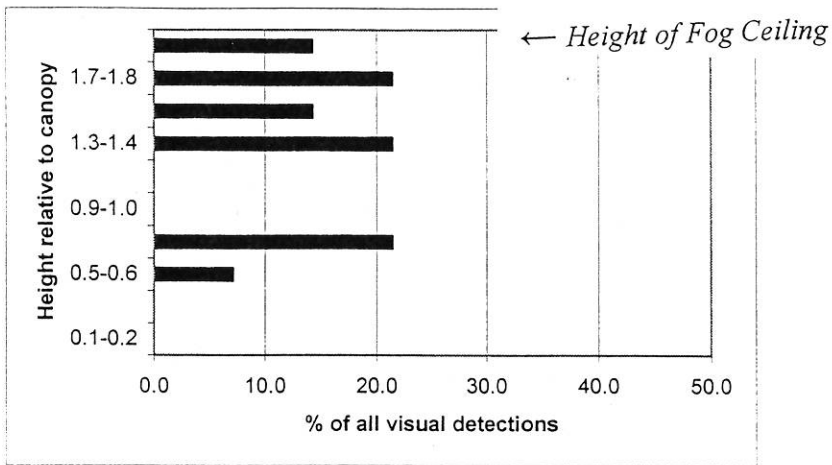
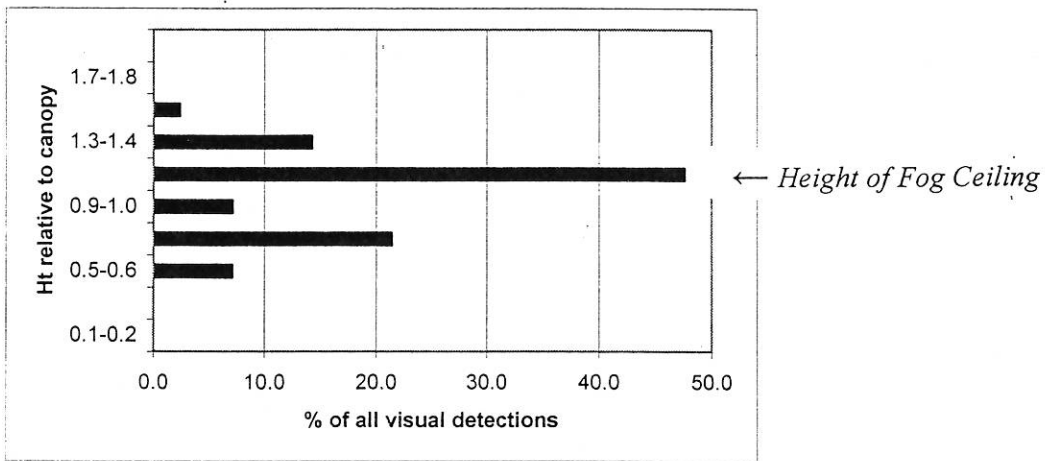


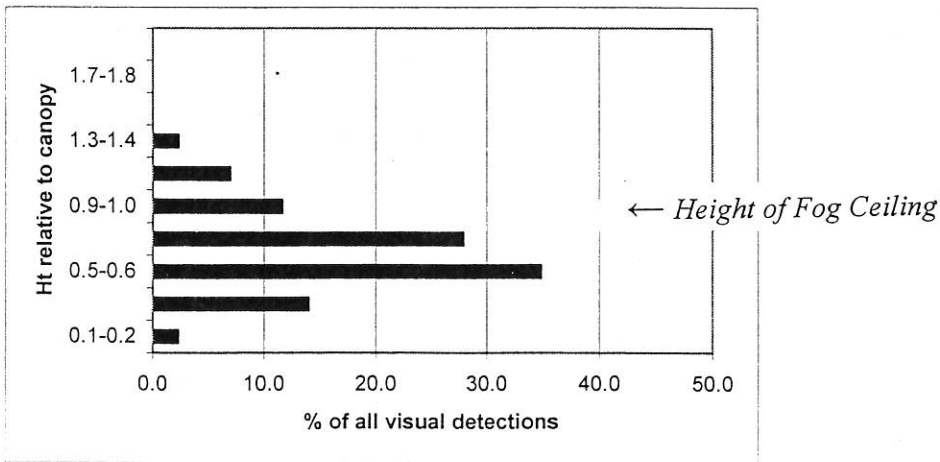
Figure 3. Median, maximum and minimum number of detections on dawn surveys at Redwood Meadow and Park HG, 1991-2001. See Figure 1 for sample size. Surveys occurred between April 5 and August 1 each year.



a. June 28, 2001, fog ceiling at approx. 2.0 canopy



b. June 29, 2001, fog ceiling at approx. 1.1 canopy



c. June 30, 2001, fog ceiling at approx. 0.9 canopy

Figure 4. Heights of visual detections decreased as the fog ceiling height decreased at Peter's Creek Bridge from June 28-30, 2001.