

David L. Suddjian
Biological Consulting Services
801 Monterey Avenue, Capitola, CA 95010
Telephone 831·479·9603, email dsuddjian@aol.com

April 22, 2003

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

**Re: Summary of 2002 Marbled Murrelet Monitoring Surveys
at Big Basin and Portola State Parks.**

Dear Esther,

Enclosed you will find the data from the continuing Marbled Murrelet monitoring surveys at conducted at Big Basin Redwoods State Park (Figure 1) and Portola Redwoods State Park (Figure 2) in 2002. Following is a brief summary of the results. I have also included an updated summary of murrelet activity at the Redwood Meadow / Park Headquarters area using data (mostly my own) from 1991-2002.

BIG BASIN REDWOODS STATE PARK

Three protocol-level dawn surveys were conducted at each of the five monitoring stations between June 17 and July 20, 2002 (Figure 1). Survey dates for each station were: June 18, July 2 and July 18 at "Redwood Meadow"; June 20, July 1 and July 16 at "100 Acre Woods"; June 19, July 4 and July 17 at "Blooms Creek"; June 17, July 3 and July 19 at "Huckleberry Tent #17"; and June 21, July 5 and July 20 at "Sempervirens". I conducted 15 additional surveys at Redwood Meadow and the Park HQ parking lot from April 15 to July 13 that were not part of this contract.

I conducted all the surveys in 2002. Sky conditions and precipitation during the surveys are summarized on Table 1. Fog occurred only during 4 of the 15 surveys conducted for CDFG.

In addition to the dawn murrelet survey data, I 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. I also conducted extensive additional corvid and other bird surveys (unrelated to this contract) in Big Basin from April to July, permitting me to estimate the number of ravens nesting in much of the park.

SUMMARY OF FINDINGS FOR BIG BASIN

Marbled Murrelet

Murrelet activity is summarized on Table 1. Activity in 2002 was the lowest recorded from any of the years of this monitoring study (Table 2), continuing the recently observed declining trend (Figure 3). Both total detections and detections of "occupied behavior" were very low in 2002, with the 15 monitoring surveys yielding just 66 total detections and only four detections with occupied behavior. Ten (67%) of the surveys had *no detections at all!* None were recorded on any of the surveys at Huckleberry #17 or Sempervirens. Surveys at Redwood Meadow produced 85% of all detections recorded, and 100% of the occupied behavior detections. There were no observations of particular interest during any of the surveys at the monitoring stations (but see below for observations of a nest and predation events elsewhere). I noticed a continuing pattern of a paucity of detections before sunrise, even on clear mornings. This further suggested limited nesting activity.

The 15 additional protocol-level dawn surveys conducted at the Redwood Meadow and adjacent Park Headquarters parking lot in 2002 increased the sample from these sites to 117 total dawn surveys from 1991-2002. Results from these sites are given in Table 3, and illustrated on Figures 4, 5 and 6. The meadow and parking lot 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. Activity levels observed in 2002 at Redwood Meadow / Park HQ continued the highly significant downward trend in numbers of detections. Indeed, 50% of the 18 surveys conducted there this year had 10 or fewer detections, and one survey on *July 9* had *only 2* detections!

Discovery of a Murrelet Nest & Observations of Corvid Predation on Murrelets

I found a Marbled Murrelet nest, and I made two observations of Common Ravens preying on murrelet chicks. These observations were made during field efforts that were not directly related to the monitoring surveys. In both instances the observations involved adult ravens that were nesting in near proximity to where I witnessed the predation events.

July 2, 2002 Predation. At mid-morning on July 2 I was at the south end of the Opal Creek Picnic Area, where Gazos Creek Road joins North Escape Road. I was watching

the activities of a pair of adult ravens that resided in that area. At 10:28 a.m. I noticed one of the ravens, which had been away from view for 15 minutes, was flying toward me, going south over Opal Creek. It turned from over the creek and flew through the trees toward the parking lot for the picnic area, and landed in a redwood over the picnic tables. As it passed overhead I saw that it was carrying a brown blob-shaped item in its bill. It perched in plain view about 40 meters away from me, and with my spotting scope I could see clearly that the item it carried was a downy Marbled Murrelet chick! I could see the characteristic mottled dark brown and warm tan coloring, the black pointed bill, and even the pale egg tooth. I estimated that it was only about one week old, based on its small size. It hung limp in the raven's bill, and so appeared already dead when the raven flew in to the tree.

The raven held the murrelet chick against the branch using one foot. It looked to either side for a moment, and then pecked at the limp chick about six times, giving fairly hard blows to the body. It then picked the chick up in its bill and swallowed it whole, and then remained perched silently for about two minutes. Then it flew off calling and joined its mate across the creek. I don't know where the plundered murrelet nest was located, but based on many observations of the travels of this raven pair, most of their activities were focused near the south end of Opal Creek Picnic Area.

July 14-15, 2002 Discovery of a Nest and Subsequent Predation. At dusk on July 14 I was in Blooms Creek campground watching for Vaux's Swifts and listening for any murrelet calls that I might hear. I was near camp site #125 when, about 10 minutes after sunset, I saw a murrelet pass overhead with what looked to be a fish in its bill. The light was fairly low and it was hard to be sure, but having seen birds carrying fish on a number of occasions, it fit the general appearance. It flew directly toward a Douglas-fir just across the creek from the campsite. About 1.5 minutes later I saw what I took to be the same bird fly out in the opposite route, and it did not appear to have anything in its bill. Suspecting a murrelet nest, I changed my plans for a monitoring survey the next morning and instead decided to stake out the spot to see what I could learn.

On July 15 I saw one murrelet fly in along the same route toward the tree at 28 minutes before sunrise, when it was still too dark to see well. One bird flew out two minutes later. At 11 minutes after sunrise I again saw one bird fly in to the tree, and I could see this time that it carried a small fish crossways in its bill. I saw where it landed, but the trees were still in shadow and I was not able to discern the details of what happened on the limb. Then after one minute I saw what I presumed was the same bird fly out from the limb, passing low overhead without anything in its bill. Now I was reasonably confident there was a nest with a chick on that limb.

At 29 minutes after sunrise an adult raven (one of the pair resident in the campground) flew in and landed in the tree, with a group of three begging juveniles tagging along after it and perching in an adjacent tree. Events transpired quickly, but I clearly saw the raven go to the nest limb, and I saw an adult murrelet flush off the branch. The raven picked up a rather small murrelet chick in its bill and promptly swallowed it. Meanwhile, the adult murrelet made one broad looping flight around the nest tree before flying off along the

route where I had seen the fly-ins and fly-outs. The circumstances indicated that the raven had flushed a brooding adult murrelet and then ate the recently hatched chick. I searched below the tree for eggshell fragments, but found nothing. However, very dense huckleberry growth below the tree hampered the search.

The Douglas-fir nest tree was 2.04 m dbh, and estimated to be about 45-48 m tall, with a broken top. It had multiple large limbs. The nest limb was estimated to be about 28 m above the ground, and was the second lowest limb on the tree. I estimated the limb was about 0.3 m diameter at its base. The nest limb exited the bole to about 80 degrees, and then bent sharply toward 50 degrees. Foliar cover immediately around the limb was moderate, mostly provided by foliage and twigs of the limb itself. Adjacent trees to the north and south provided cover around the tree, but the forest canopy was open to the east and west. The flight route to and from the tree that had I observed went from 320 degrees to 140 degrees, passing directly over the campground. The tree was on a slope of about 40 degrees, and was 27.5 m from the Blooms Creek (as measured along the slope). The tree was within about 35 m of the edge of the campground.

Corvids

Steller's Jay was detected at all stations on all surveys. Numbers were highest at Huckleberry #17, and relatively high at Blooms Creek and Redwood Meadow (Table 4). The lowest numbers were at the two stations furthest away from campgrounds and other concentrated areas of human uses.

Common Ravens were detected at all stations (Table 4). Numbers ranged from 0-6 per survey. They were most consistently detected at Redwood Meadow, Bloom's Creek and Huckleberry #17, and least frequently noted at the two stations farthest from campgrounds. Details of observations during the surveys are given on the "Common Raven Observation Form" attached to each survey's murrelet data.

Extensive surveys in Big Basin from April to July 2002 indicated at least 15 pairs of Common Ravens were nesting in the park at that time. The approximate location of each nesting pair (or its general focus of activity) is shown on Figure 7. (Note: the observations summarized in Figure 7 included essentially all of the watersheds of Waddell Creek, including its East and West Forks and tributaries, but did *not* include parts of the park in other watersheds, such as those of Gazos, Cascade, Scott and Boulder creeks and other outlying areas). Eight pairs were concentrated in the relatively small area of the park where the campgrounds and picnic areas occur, while pairs were apparently more widely spaced away from those area of concentrated human uses (Figure 7). From what I observed, all nesting pairs successfully fledged 3-4 young each.

An exceptional number of ravens were noted during a dawn murrelet survey at Redwood Meadow on April 21. That morning there were approximately 70 ravens in the vicinity of the meadow, Park HQ and the south end of Opal Creek Picnic Area. I suspect they roosted in that area. Even after the murrelet survey there were still about 25 ravens

gathered near the south end of Opal Creek Picnic Area, in the immediate area of one of the murrelet nest trees found by Steve Singer et al. in 1989.

Human food was observed to be commonly available to corvids in all the campgrounds, including food that was left out, food containers opened by corvids or western gray squirrels, and spilled garbage. It was not uncommon to see campers actively feeding corvids (especially jays) and other wildlife. Spilled garbage was observed on nearly every visit to the Opal Creek picnic area, Blooms Creek campground and Huckleberry Campground, but garbage seemed to be better managed near Park HQ than in recent years.

Raptors

Details of all raptor detections made during the surveys are given on the forms labeled "List of Birds Recorded During MAMU Survey."

Sharp-shinned Hawk was detected during surveys at Bloom's Creek, where a family group of fledged young was eventually found on July 19. They were east of the station in the same area as where nesting occurred in 2001. In addition (outside the murrelet surveys), I also found a pair of Sharp-shinned Hawks on Middle Ridge southwest of Redwood Meadow in June, and a family group along the Hollow Tree Trail northwest of 100-Acre Woods in July.

Cooper's Hawk was not detected during the murrelet surveys, but in June I found pairs at Huckleberry Campground and at 100 Acre Woods. An adult female was at Blooms Creek Campground on July 19, mobbed by a flock of 25-30 angry Steller's Jays!

I heard a Red-shouldered Hawk northwest of Redwood Meadow during one the dawn survey on July 2, and a pair was in that area on other occasions in May and June. Another or the same was west of Blooms Creek station on July 19.

My only detection of Peregrine Falcon was of one that flew over Redwood Meadow during a dawn survey on April 21.

Western Screech-Owl, Northern Pygmy-Owl, and Northern Saw-whet Owl were heard in various places. A Barn Owl was heard occasionally near Blooms Creek Campground, Park HQ and near Sky Meadow Group Camp. A Long-eared Owl was found one night along Middle Ridge near Ocean View Summit.

PORTOLA REDWOODS STATE PARK

Protocol-level dawn murrelet surveys were conducted at Peter's Creek Bridge (Figure 2) on three successive mornings from June 26-28, 2002, dates similar to efforts of previous years when three surveys also occurred in very late June or very early July. I conducted all the surveys. In addition to the murrelet survey data, other information was gathered as described above for Big Basin.

SUMMARY OF FINDINGS FOR PORTOLA

Marbled Murrelet

Murrelet activity at Portola in 2002 is summarized on Table 5. Activity was lower than other previous years for which I have data available (Table 6, Figure 8). Activity levels were surprisingly similar between dates, and there were very few detections with occupied behavior. As at Big Basin, murrelet activity before sunrise was unusually low. There were no detections with particularly interesting behaviors.

Corvids

Steller's Jays were detected on all three surveys, with maximum counts on point counts and estimates from the 2-hour survey period both ranging from 8-12 birds. Two family groups of Common Ravens, each with 3 fledged young, were active near the station. These spent long periods of time in the vicinity of the survey station and nearby campground, and along Pescadero Creek. Maximum counts of ravens on point counts ranged from 1-6, with 4-7 local birds estimated for the 2-hour survey period. The local adults were regularly seen foraging successfully in the campground. Food was available at campsites, but no spilled garbage was observed.

A flock of 23 ravens (about 75% juveniles) was seen passing north about 40 m over the canopy on June 27. These were likely flying commuting to the San Francisco Bay Area to forage from some roost, with no evidence that the roost was located near the Peter's Creek survey station. I suspect it may not even have been in Portola State Park.

On the corvid vs. corvid front, on two occasions I saw an adult raven fly by me with a fledgling Steller's Jay in its bill. This helped explain why the jays in the campground got very agitated whenever the local ravens came through the camp. Perhaps the naïve young jays are relatively easy targets.

Raptors

A male Sharp-shinned Hawk flew over the bridge during the June 27 survey. I found a nest with four large young in a redwood between the south end of the campground and the beginning of the Old Tree Trail. Another family of Sharp-shinned Hawks, this one with three fledged young, was along the lower part of Coyote Ridge Trail. Cooper's

Hawk was not detected during the surveys, but I found a nest with four large young in a Douglas-fir near the Iverson Trail. A pair of Red-shouldered Hawks was in the general vicinity of the station, especially north-northwest of the park HQ. Peregrine Falcon was not detected this year.

* * *

Please contact me if you have any questions.

Sincerely,

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 17 – July 20, 2002

Station	Date	Obs.	Cloud Cover	Precip.	Total # Dets.	# OB ¹ Dets.
Redwood Meadow	18 June 02	DLS	0%	None	9	1
Redwood Meadow	2 July 02	DLS	0%	None	10	3
Redwood Meadow	18 July 02	DLS	100%	Fog	37	0
100 Acre Woods	20 June 02	DLS	0-100%	None	8	0
100 Acre Woods	1 July 02	DLS	0%	None	0	0
100 Acre Woods	16 July 02	DLS	50%	None	0	0
Blooms Creek	19 June 02	DLS	0%	None	0	0
Blooms Creek	4 July 02	DLS	0%	None	0	0
Blooms Creek	17 July 02	DLS	100%	Fog	2	0
Huckleberry #17	17 June 02	DLS	0%	None	0	0
Huckleberry #17	3 July 02	DLS	100%	Fog	0	0
Huckleberry #17	19 July 02	DLS	100%	Fog	0	0
Sempervirens	21 June 02	DLS	100%	None	0	0
Sempervirens	5 July 02	DLS	0%	None	0	0
Sempervirens	20 July 02	DLS	0%	None	0	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 from 1995 to 2002.

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
	2002	3	18.7	15.9	1.3	1.5
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
	2002	3	2.7	4.6	0.0	0.0
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
	2002	3	0.7	1.2	0.0	0.0
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
	2002	3	0.0	0.0	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
	2002	3	0.0	0.0	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
	2002	15	4.4	9.7	0.3	0.8

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, 1991-2002.¹

Date	Observer	Location	Precip.	% Cover	# Total	# OB.
					# Dets.	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

Table 3, continued.

Date	Observer	Location	Precip.	% Cover	# Total	# OB.
					# Dets.	Dets.
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
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	91	
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

Table 3, continued.

Date	Observer	Location	Precip.	% Cover	# Total	# OB.
					# Dets.	Dets.
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
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
4/15/02	D. Suddjian	Redwood Meadow	Fog	100	9	0
4/21/02	D. Suddjian	Redwood Meadow	Fog	100	28	0
5/3/02	D. Suddjian	Redwood Meadow	Fog	100	134	4
5/15/02	D. Suddjian	Redwood Meadow	None	0	12	0
5/28/02	D. Suddjian	Redwood Meadow	None	0	10	0
5/29/02	D. Suddjian	Redwood Meadow	None	0	5	0
6/2/02	D. Suddjian	HQ Parking Lot	Fog	100	26	1
6/9/02	D. Suddjian	Redwood Meadow	None	0	7	0
6/12/02	D. Suddjian	Redwood Meadow	Fog	0-100	3	0
6/16/02	D. Suddjian	Redwood Meadow	None	0	4	0
6/18/02	D. Suddjian	Redwood Meadow	None	0	9	1
6/22/02	D. Suddjian	Redwood Meadow	Fog	100	19	1
7/2/02	D. Suddjian	Redwood Meadow	None	0	10	2
7/6/02	D. Suddjian	Redwood Meadow	Fog	100-0	20	4
7/8/02	D. Suddjian	HQ Parking Lot	None	0	11	1
7/9/02	D. Suddjian	Redwood Meadow	None	0	2	0
7/13/02	D. Suddjian	HQ Parking Lot	None	0	59	13
7/18/02	D. Suddjian	Redwood Meadow	Fog	100	37	0

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. High counts for Steller's Jay and Common Raven from 10-minute point counts and 2-hour dawn surveys at Big Basin in 2002.

	<i>Steller's Jay</i>		<i>Common Raven</i>	
	Point Counts	2-hour Survey	Point Counts	2-hour Survey
Redwood Meadow	9	12	5	5
100 Acre Woods	2	4	0	1
Bloom's Creek	6	8	6	6
Huckleberry #17	23	25	4	6
Sempervirens	3	7	2	2

Notes: Point counts included 2 counts per survey. Counts from the 2-hour survey were the best estimate of the total number of individuals during that entire dawn survey period.

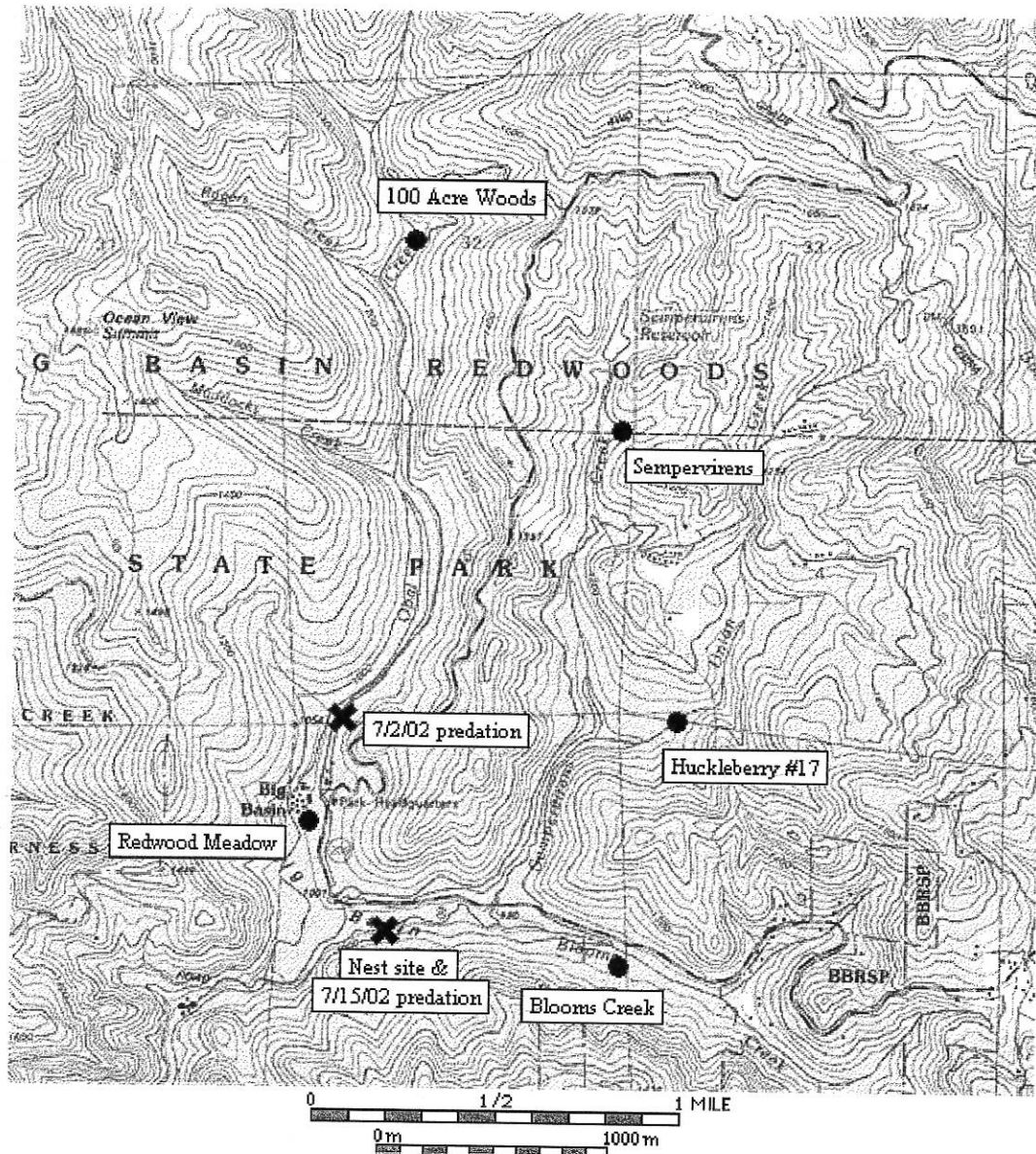
Table 5. Summary of dawn murrelet surveys conducted for the California Dept. of Fish and Game at Portola Redwoods State Park from June 26 – June 28, 2002

Station	Date	Obs.	Cloud Cover	Precip.	Total # Dets.	# OB ¹ Dets.
Peter's Creek Bridge	26 June 02	DLS	100%	Fog	33	4
Peter's Creek Bridge	27 June 02	DLS	66-100%	Fog	33	3
Peter's Creek Bridge	28 June 02	DLS	100%	Fog	31	1

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

Table 6. Comparison of murrelet activity levels between years at the Portola station, 1992-2002.

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
	1998	3	73.7	22.3	18.0	16.5
	2001	3	79.0	22.3	19.7	18.8
	2002	3	32.3	1.2	2.7	1.5



Printed from TOPO! ©1998 Wildflower Productions (www.topo.com)

Figure 1. Location of monitoring stations at Big Basin Redwoods State Park, and locations of murrelet nest and observations of murrelet predation in 2002.

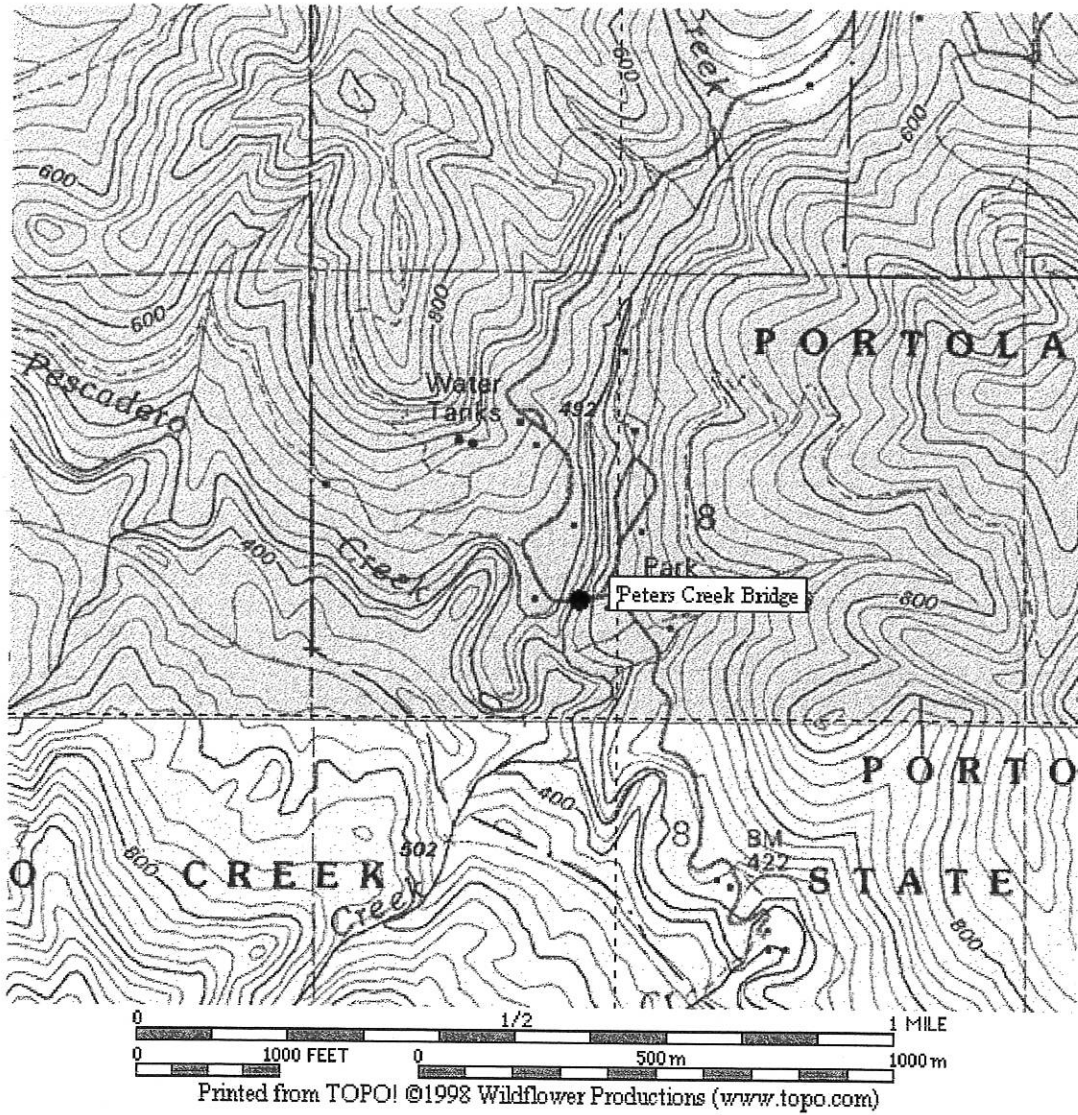


Figure 2. Location of monitoring station at Portola Redwoods State Park.

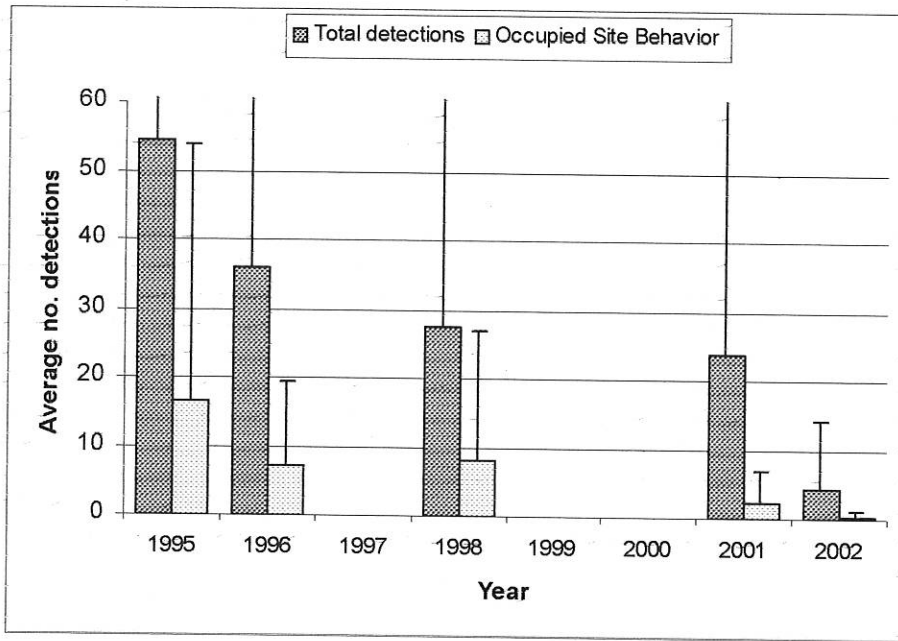


Figure 3. Summary of results from all five Big Basin stations combined. Note: no data from 1997, 1999 or 2000.

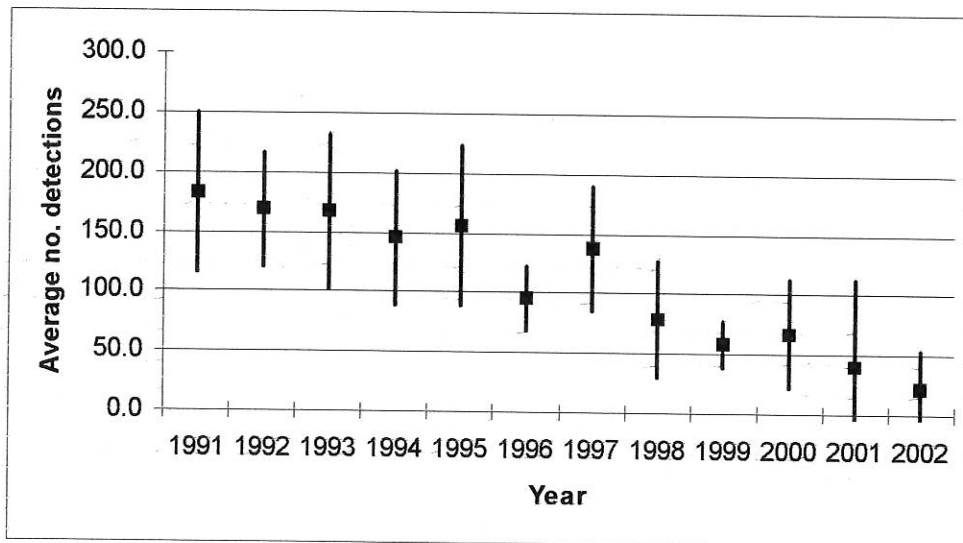


Figure 4. Average number of detections (\pm s.d) on dawn surveys at Redwood Meadow and Park HQ, 1991-2002. See text for sample sizes for each year. Surveys occurred between April 5 and August 1 each year.

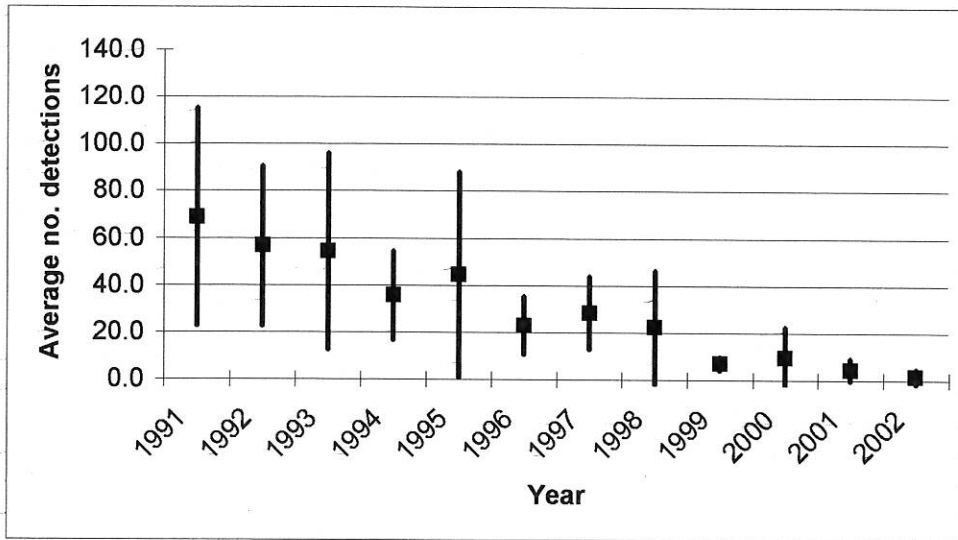


Figure 5. Average number of occupied behavior detections (\pm s.d) on dawn surveys at Redwood Meadow and Park HQ, 1991-2002. See text for sample sizes. Surveys occurred between April 5 and August 1 each year.

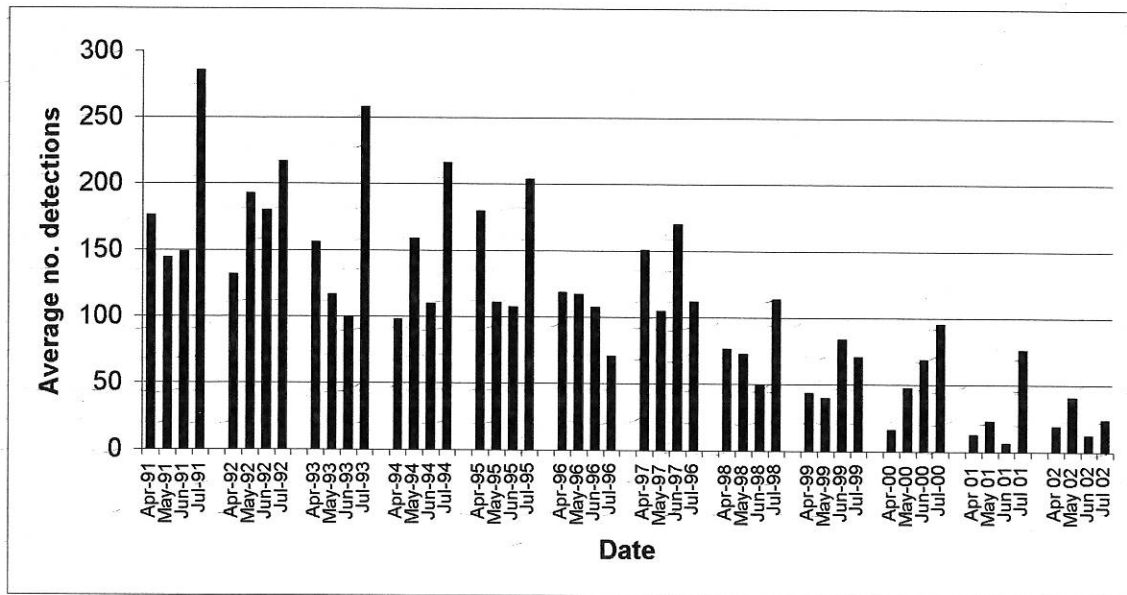


Figure 6. Average number of detections on dawn surveys at Redwood Meadow and Park HQ by month, 1991-2002.

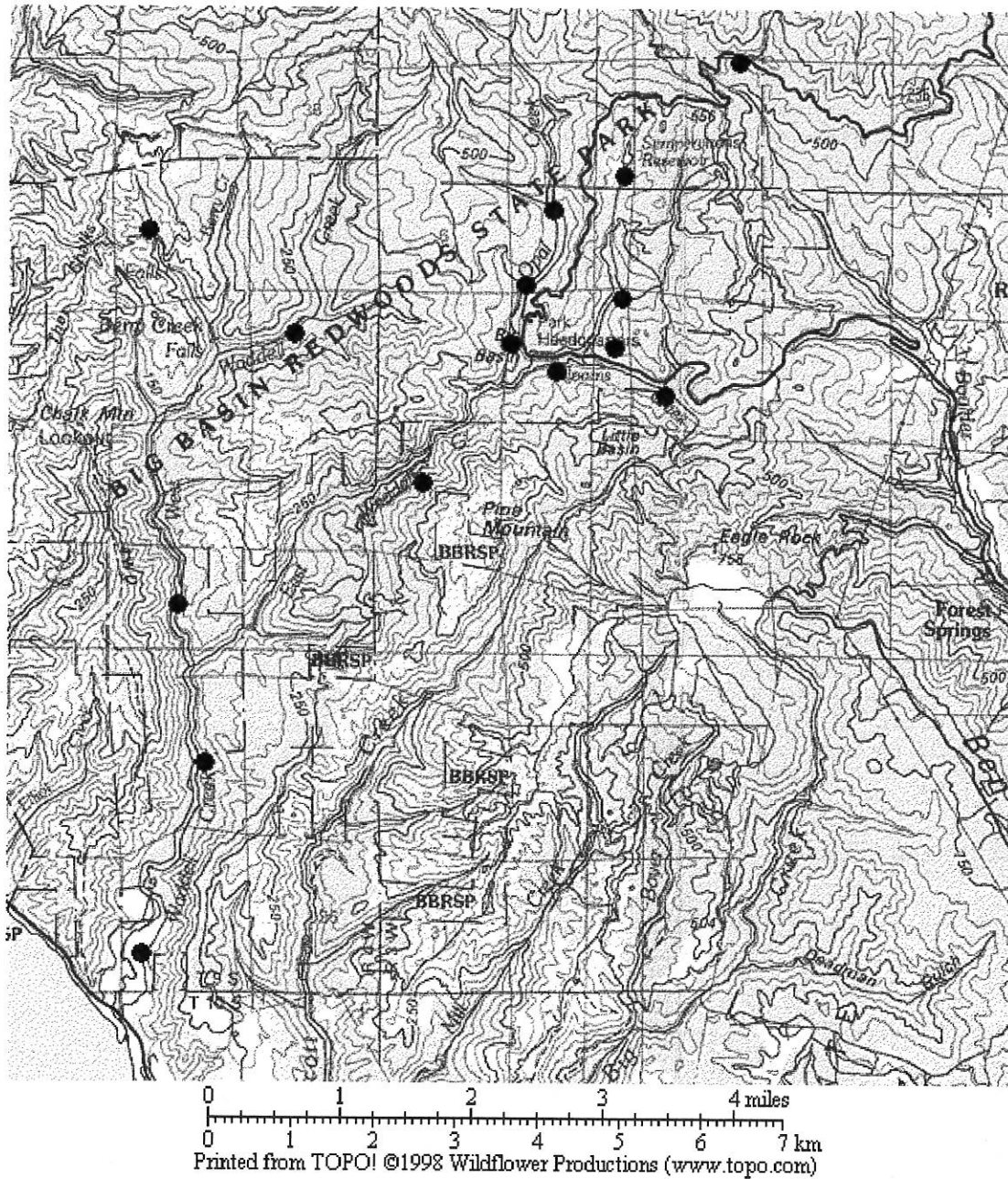


Figure 7. Distribution of nesting pairs of Common Ravens in Big Basin Redwoods State Park in 2002. Notes: (1) dots indicate general locations or areas where pairs focused activities, (2) only pairs shown in the Waddell Creek watershed, including East and West Forks and tributaries, are shown.

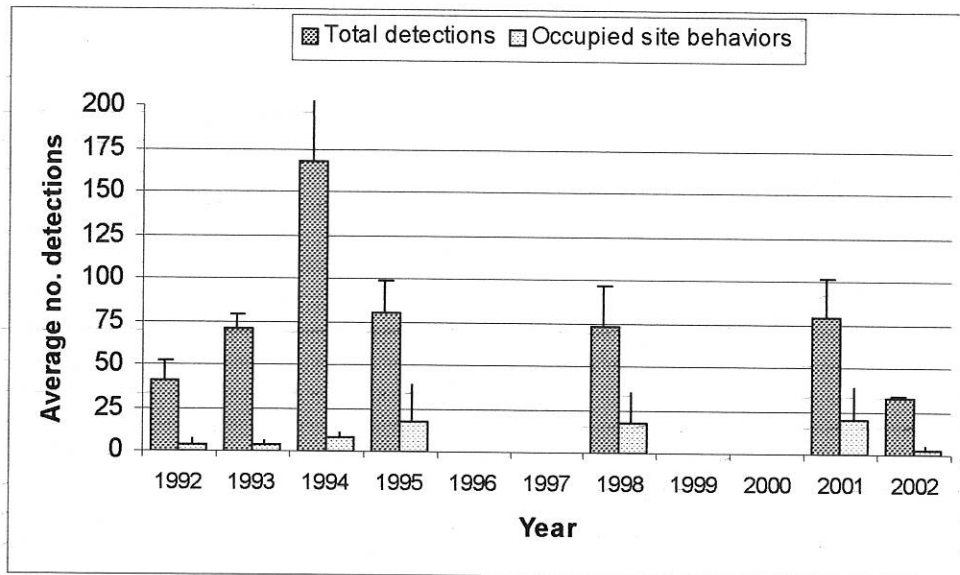


Figure 8. Average detections for surveys at Peter's Creek Bridge on 3 consecutive mornings (late June or early July).