



**Humboldt
Redwood™**

Pacific Fisher Annual Report 2015

June 1, 2015



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Cover photo: Pacific Fisher at bait pack at Yager Creek (unit 43).

Project Description

Title: Pacific Fisher Annual Report 2015

Purpose: Habitat conservation plan monitoring

Date Initiated: March 1999

Projected End Date: Ongoing

Managers: Sal Chinnici, Manager Forest Science, and Brad Mauney, Lead Wildlife Biologist

Executive Summary:

The Pacific fisher (*Pekania pennanti*) is a medium-sized carnivore in the weasel family. It is one of 17 covered species of the HRC Habitat Conservation Plan (HCP). The fisher is currently both a Federal and State candidate for listing under the respective Endangered Species Acts, and is a California Species of Special Concern.

The HCP conservation strategy for the Pacific fisher is a combination of a habitat-based approach with an additional structural component element. The management objective is to maintain enough suitable habitat to contribute to a sustainable population of the species in the northern California coastal province. Conservation measures include retention of late seral habitat, aquatic resource protection, measures to retain and recruit habitat structural components, and old growth habitat reserves (i.e., the Marbled Murrelet Conservation Areas or MMCAs).

Monitoring for this species is through forest carnivore surveys to establish continued occupancy of HRC lands, and tracking of seral stage distribution in Watershed Assessment Areas (WAAs). No changes in the monitoring strategy are recommended at this time.

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INTRODUCTION

PURPOSE

The HCP conservation strategy for the Pacific fisher (*Pekania pennanti*) is a combination of a habitat-based approach with an additional structural component element. The management objective (HCP 6.8.1) is to maintain enough suitable habitat to contribute to a sustainable population of the species in the northern California coastal province. Conservation measures (HCP 6.8.2) include retention of late seral habitat, aquatic resource protection, measures to retain and recruit habitat structural components, and old growth habitat reserves (i.e., the Marbled Murrelet Conservation Areas or MMCAs). Seral stage distribution is to be tracked and reported.

In order to generate more robust information about fisher distribution in the HCP area, a forest carnivore survey methodology was developed in 1999-2000, and implementation of the strategy began in 2000. Remote baited camera sets were used according to the methods of Zielinski and Kucera (1995). The 2000-2005 baseline survey established the occupancy of fisher in survey units in most WAAs across HRC lands. Beginning in 2010 a second survey cycle of HRC lands was initiated according to the same methods. This report summarizes the 2000-2005 survey, current results of the second cycle, compares occupancy of the survey units, and reports seral stage distribution.

BASELINE SURVEY (2000-2005)

METHODS

In accordance with the methods developed for the Pacific fisher research/monitoring project, a property-wide assessment to determine possible fisher presence and distribution on HRC lands was completed in 2005. The assessment occurred over a five-year period (2000-2005), including a total of 119 sample units, according to Zielinski and Kucera (1995) methods. All lands covered under the HCP (approximately 210,000 acres) comprised the pool from which the sample units were selected for the duration of the project (Table 1).

The sample units are four square mile areas, following the alignment of section lines. This unit size was designed to take in the known variations in Pacific fisher home range, and to be consistent with other studies being conducted within the Pacific Northwest (Zielinski and Kucera 1995). Each of these sample units received either two TrailMaster 1500 single sensor photographic stations, two TrailMaster 550 dual sensor photographic stations, or a combination of the two, for a minimum of 35 sample nights.

RESULTS

The sample units scheduled for the final season of the initial assessment were completed by April 2005 (Table 2). This completed the requirements of the HCP for the property-wide assessment for Pacific fisher monitoring.

Results of the baseline survey included the establishment of Pacific fisher presence in all of the large Watershed Assessment Areas (WAAs) on HRC lands, with the exception of the Van Duzen WAA. Subsequently we found that Green Diamond Resource Company had reported presence of fisher in this WAA.

“Incidental detections” consist of documented fisher sightings within the sample unit, but not at the camera trap.

There were relatively few detections overall, with presence established in 15 sample units. There were 118 sample units completed during the initial five year survey, at a rate of 70 camera nights per unit (2 cameras per unit), for a total of 6,370 sample nights. Survey unit 118 could not be done as the PALCO property in that unit was sold prior to the survey. The 15 detections from 118 sample units resulted in a detection rate of 0.13. Thus, fisher may be well distributed spatially on HRC lands, but may occur in relatively low numbers based on the sample results.

Table 1. Order of units sampled over the initial five-year period for the Pacific fisher (*Pekania pennanti*).

Unit Sampling Order				
(2000-2001)	(2001-2002)	(2002-2003)	(2003-2004)	(2004-2005)
10	19	18	114	57
111	53	67	54	60
116	88	59	24	74
23	71	94	72	9
22	110	4	16	103
96	40	64	15	65
80	90	45	76	2
107	115	55	75	69
87	68	83	41	79
105	92	34	11	102
33	97	32	66	77
7	6	117	31	30
112	20	118*	106	13
49	27	46	43	14
29	8	89	108	26
28	85	37	5	36
73	109	17	101	82
50	44	52	70	38
42	3	100	48	12
58	56	84	95	
61	119	104	62	
1	47	21	93	
81	35	25	39	
91	98	99	113	
63	51	86	78	

Units not surveyed due to active harvesting, access problems, or end of survey season. These units were sampled at the end of successive years in numerical order, time and weather permitting, or they were sampled in the 5th year of the study (except 118).

Surveyed in year 2

Surveyed in year 3

* Unit 118 (Redway) was sold by PALCO, and was not surveyed.

Table 2. Fisher detections, all methods, 2000 - 2005.

Sample Unit	Detection Year	Zone	Sample Order	Contact Type
32	2000	II	11	Incidental
43	2000	II	14	Incidental
97	2001	IV	11	Incidental
24	2002	I	3	Incidental
27	2002	II	14	Camera
85	2002	IV	16	Camera
115	2002	V	8	Incidental
17	2003	I	17	Camera
25	2003	I	23	Camera
37	2003	II	16	Camera
37	2003	II	16	Incidental
41	2003	II	9	Incidental
5	2004	I	16	Camera
11	2004	I	10	Camera
95	2004	IV	20	Camera

SECOND SURVEY CYCLE 2010-2015

METHODS

The methods for this resurvey begun in 2010 are similar to the initial property-wide survey of 2000-2005. The schedule of the resurvey mirrors the original survey (Table 3).

During the 2010-2011 season each of the sample units received either two Bushnell Trophy Trailcam monitoring systems, two TrailMaster 550 dual sensor photographic stations, or a combination of the two, for a minimum of 35 sample nights. Bait packs (~10kg) were wired to a tree in a suitable location within the four square mile units. Gusto (added to lanolin for ease of field application) was also used as an extra attractant or lure. Camera stations were checked weekly and bait packs replaced as necessary and any adjustments, repair, camera film, SD card or battery replacement would occur at that time.

During this period, five sample units were surveyed using the older style Trailmaster 550 cameras. No fishers were detected using these trail monitoring systems. Black bear activity was very high in November through December 2010, but tapered off significantly by mid-January 2011. Damage to the Trailmaster camera sets from black bears is common (e.g. severed cords) and can reduce camera effectiveness, possibly leading to false negatives.

To reduce such problems, in January 2011 we purchased Bushnell Trophy Trailcam camera monitoring systems to phase in and eventually replace the Trailmaster 550 cameras. The Bushnell Trailcams are a digital camera without the peripheral equipment (e.g. connecting cords) that can lead to problems with the Trailmaster systems.

The new camera traps appeared to yield positive results almost immediately. We used the first two Bushnell cameras in the upper watershed of Bear River in unit 96. There was a fisher detection on 22 February 2011 that occurred in plot 96 B (just north of the Chisum Pond) and appeared to be a female or juvenile based on the relatively small size. Another fisher was detected on 20 May 2011 in the Larabee Creek drainage at unit 80 B. The new camera systems seemed to work efficiently, required less maintenance, and appeared to provide excellent feedback.

By the 2011-2012 survey season we had converted our camera traps entirely to the Bushnell Trophy Trailcam systems. Other than the change in camera systems, surveys have continued during the current reporting period using the same methods as for the previous surveys.

Table 3. Proposed order of units to be sampled over a five-year period (2010 – 2015) for the Pacific

Species	Scientific Name	# of Traps Where Detected	Trap Detection Rate	# of Units Where Detected	Unit Detection Rate
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fisher (*Pekania pennanti*) on HRC property.

Unit Sampling Order				
(2010-2011)	(2011-2012)	(2012-2013)	(2013-2014)	(2014-2015)
10	19	18	114	57
111	53	67	54	60
116	88	59	24	74
23	71	94	72	9
22	110	4	16	103
96	40	64	15	65
80	90	45	76	2
107	115	55	75	69
87	68	83	41	79
105	92	34	11	102
33	97	32	66	77
7	6	117	31	30
112	20	118*	106	13
49	27	46*	43	14
29	8	89	108	26
28	85	37	5	36
73	109	17	101	82
50	44	52	70	38
42	3	100	48	12
58	56	84	95	
61	119	104	62	
1	47	21	93	
81	35	25	39	
91	98	99	113	
63	51	86	78	

* Units 46 and 118 are no longer part of HRC property and will not be surveyed.

RESULTS

During the 2010 - 2015 survey period 86 units (172 camera traps) have been surveyed to date for a total of 6,020 camera nights. Camera trap results from 2010 - 2015 surveys include detections of 29 different species (

Black Bear	<i>Ursus americanus</i>	92	0.53	60	0.70
Gray Fox	<i>Urocyon cinereoargenteus</i>	48	0.28	39	0.45
Blacktail Deer	<i>Odocoileus hemionus</i>	48	0.28	37	0.43
Pacific Fisher	(<i>Pekania pennanti</i>)	41	0.24	33	0.38
None	NA	25	0.15	19	0.22
Bobcat	<i>Lynx rufus</i>	24	0.14	18	0.21
Virginia Opossum	<i>Didelphis virginiana</i>	23	0.13	18	0.21
Western Spotted Skunk	<i>Spilogale gracilis</i>	19	0.11	17	0.20
Coyote	<i>Canis latrans</i>	20	0.12	17	0.20
Turkey Vulture	<i>Cathartes aura</i>	16	0.09	12	0.14
Western Gray Squirrel	<i>Sciurus griseus</i>	15	0.09	12	0.14
Mountain Lion	<i>Puma concolor</i>	10	0.06	10	0.12
Raccoon	<i>Procyon lotor</i>	8	0.05	8	0.09
Ringtail	<i>Bassariscus astutus</i>	5	0.03	5	0.06
Wild Pig	<i>Sus scrofa</i>	5	0.03	4	0.05
Roosevelt Elk	<i>Cervus canadensis roosevelti</i>	4	0.02	3	0.03
Douglas' Squirrel	<i>Tamiasciurus douglasii</i>	4	0.02	4	0.05
Steller's Jay	<i>Cyanocitta stelleri</i>	3	0.02	3	0.03
Unknown Rodent	NA	3	0.02	3	0.03
Gray Jay	<i>Perisoreus canadensis</i>	3	0.02	3	0.03
Varied Thrush	<i>Ixoreus naevius</i>	2	0.01	2	0.02
Common Raven	<i>Corvus corax</i>	2	0.01	2	0.02
Domestic Dog	<i>Canis familiaris</i>	2	0.01	2	0.02
Domestic Cattle	<i>Bos taurus</i>	2	0.01	2	0.02
Least Chipmunk	<i>Tamias minimus</i>	1	0.01	1	0.01
Red-tailed Hawk	<i>Buteo jamecensis</i>	1	0.01	1	0.01
Wild Turkey	<i>Meleagris gallopavo</i>	1	0.01	1	0.01
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	1	0.01	1	0.01
Unknown	NA	1	0.01	1	0.01

Table 4). There were no observable detections at 25 traps (nineteen units). Unidentifiable rodent (three traps) and unidentifiable other species (one trap) were also detected.

Pacific fishers were detected at 41 of the camera traps, covering 33 of the 86 surveyed sample units, for a trap detection rate of 0.24, a slight decrease compared to the 2014 rate of 0.26, but a significant increase to the 0.13 rate for the total baseline survey results. The fisher unit detection rate is now 0.38, compared to the 0.40 reported in 2014. There have been a total of ten Pacific fisher detections during the 2014 – 2015 season to date. The Pacific fisher trap detection rate is now second only to black bear, blacktail deer

and gray fox (same trap detection rate). Black bears (*Ursus americanus*) were the most commonly detected species (0.53 trap, 0.70 unit), followed by blacktail deer (*Odocoileus hemionus*, 0.28, 0.43), gray fox (*Urocyon cinereoargenteus*, 0.28, 0.45) and then fisher (0.24, 0.38). Gray fox detection rates increased slightly to 0.28, 0.45. The Virginia opossum (*Didelphis virginiana*) trap detection rate showed a slight decrease from 0.15 to 0.13, and from 0.23 to 0.21 for the unit detection rate. Bobcat (*Lynx rufus*) trap detections decreased slightly with this report, from a trap detection rate of 0.17 to 0.14, and decreases slightly from 0.24 to 0.21 at the unit level. Bobcats are a known predator of fishers (e.g. Lofroth et al. 2010).

The only new species detected this year was a red-tailed hawk (*Buteo jamaicensis*)



Bushnell

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Figure 1. Photo of elk at camera trap in Yager Creek unit 44.

Table 4. Species Detected by Camera Trap and Unit 2010-2015.

Species	Scientific Name	# of Traps Where Detected	Trap Detection Rate	# of Units Where Detected	Unit Detection Rate
Black Bear	<i>Ursus americanus</i>	92	0.53	60	0.70
Gray Fox	<i>Urocyon cinereoargenteus</i>	48	0.28	39	0.45
Blacktail Deer	<i>Odocoileus hemionus</i>	48	0.28	37	0.43
Pacific Fisher	(<i>Pekania pennanti</i>)	41	0.24	33	0.38
None	NA	25	0.15	19	0.22
Bobcat	<i>Lynx rufus</i>	24	0.14	18	0.21
Virginia Opossum	<i>Didelphis virginiana</i>	23	0.13	18	0.21
Western Spotted Skunk	<i>Spilogale gracilis</i>	19	0.11	17	0.20
Coyote	<i>Canis latrans</i>	20	0.12	17	0.20
Turkey Vulture	<i>Cathartes aura</i>	16	0.09	12	0.14
Western Gray Squirrel	<i>Sciurus griseus</i>	15	0.09	12	0.14
Mountain Lion	<i>Puma concolor</i>	10	0.06	10	0.12
Raccoon	<i>Procyon lotor</i>	8	0.05	8	0.09
Ringtail	<i>Bassariscus astutus</i>	5	0.03	5	0.06
Wild Pig	<i>Sus scrofa</i>	5	0.03	4	0.05
Roosevelt Elk	<i>Cervus canadensis roosevelti</i>	4	0.02	3	0.03
Douglas' Squirrel	<i>Tamiasciurus douglasii</i>	4	0.02	4	0.05
Steller's Jay	<i>Cyanocitta stelleri</i>	3	0.02	3	0.03
Unknown Rodent	NA	3	0.02	3	0.03
Gray Jay	<i>Perisoreus canadensis</i>	3	0.02	3	0.03
Varied Thrush	<i>Ixoreus naevius</i>	2	0.01	2	0.02
Common Raven	<i>Corvus corax</i>	2	0.01	2	0.02
Domestic Dog	<i>Canis familiaris</i>	2	0.01	2	0.02
Domestic Cattle	<i>Bos taurus</i>	2	0.01	2	0.02
Least Chipmunk	<i>Tamias minimus</i>	1	0.01	1	0.01
Red-tailed Hawk	<i>Buteo jamecensis</i>	1	0.01	1	0.01
Wild Turkey	<i>Meleagris gallopavo</i>	1	0.01	1	0.01
Northern Flying Squirrel	<i>Glaucomys sabrinus</i>	1	0.01	1	0.01
Unknown	NA	1	0.01	1	0.01

A complete summary of the 2010-2015 surveys to date is provided in Table 5. Unit locations are shown on the Pacific Fisher Map accompanying this report. Table 5. 2010-2015 Pacific fisher survey summary (fisher detections in bold font).

Unit	Order	Setup Date	Pull Date	Fisher Detections	Species Detected
10A	1	12/3/2010	1/7/2011	No	black bear, gray fox
10B	1	12/3/2010	1/7/2011	No	black bear, gray fox
111A	2	12/7/2010	1/11/2011	No	blacktail deer, gray fox, black bear
111B	2	12/7/2010	1/11/2011	No	black bear
116A	3	12/9/2010	1/13/2011	No	black bear, gray fox, blacktail deer
116B	3	12/9/2010	1/13/2011	No	black bear
22A	4	12/10/2010	1/14/2011	No	black bear, gray fox
22B	4	12/10/2010	1/14/2011	No	black bear, gray fox
23A	5	12/13/2010	1/17/2011	No	none
23B	5	12/13/2010	1/17/2011	No	black bear, gray fox
105A	10	1/26/2011	3/2/2011	No	mountain lion, spotted skunk, gray fox
105B	10	1/26/2011	3/2/2011	No	gray fox
96A	6	2/3/2011	4/7/2011	No	mountain lion, gray fox, ringtail
96B	6	2/3/2011	4/7/2011	Yes	mouse spp., gray squirrel, Pacific fisher
80A	7	5/17/2011	6/21/2011	Yes	black bear, Pacific fisher
80B	7	5/17/2011	6/21/2011	Yes	opossum, black bear, Pacific fisher
107A	8	6/3/2011	7/8/2011	No	opossum, black bear
107B	8	6/3/2011	7/8/2011	No	opossum, black bear
87A	9	7/18/2011	8/22/2011	No	black bear, Stellers jay, bobcat, northern flying squirrel
87B	9	7/18/2011	8/22/2011	No	black bear
33A	11	9/7/2011	10/12/2011	No	none
33B	11	9/7/2011	10/12/2011	No	none
112A	13	9/8/2011	10/13/2011	No	raccoon, gray squirrel, opossum, black bear, spotted skunk
112B	13	9/8/2011	10/13/2011	No	black bear, gray squirrel, blacktail deer, wild pig, opossum
49A	14	11/1/2011	12/6/2011	Yes	black bear, blacktail deer, Pacific fisher
49B	14	11/2/2011	12/7/2011	No	black bear, bobcat
29A	15	11/7/2011	12/12/2011	No	black bear
29B	15	11/8/2011	12/13/2011	No	blacktail deer, gray fox, black bear
28B	16	11/15/2011	12/20/2011	No	blacktail deer, unk spp., black bear, bobcat
28A	16	11/15/2011	12/20/2011	Yes	black bear, bobcat, Pacific fisher, blacktail deer, Stellers jay, Douglas' squirrel
73A	17	12/16/2011	1/20/2012	No	bobcat, black bear, varied thrush, gray squirrel, spotted skunk, blacktail deer, opossum
73B	17	12/17/2011	1/21/2012	No	opossum
42A	19	12/27/2011	1/31/2012	No	opossum, blacktail deer
42B	19	1/3/2012	2/7/2012	No	blacktail deer, spotted skunk
58A	20	1/12/2012	3/5/2012	No	spotted skunk

Unit	Order	Setup Date	Pull Date	Fisher Detections	Species Detected
58B	20	1/12/2012	3/5/2012	No	spotted skunk, gray squirrel, bear or deer, mountain lion
7A	12	2/28/2012	4/3/2012	Yes	spotted skunk, Pacific fisher
7B	12	2/28/2012	4/3/2012	Yes	Pacific fisher
61A	21	3/16/2012	4/20/2012	No	turkey vulture
61B	21	3/16/2012	4/20/2012	No	blacktail deer, turkey vulture
1B	22	3/21/2012	4/25/2012	Yes	Pacific fisher
1A	22	3/21/2012	4/25/2012	No	none
81A	23	3/26/2012	4/30/2012	No	black bear
81B	23	3/26/2012	4/30/2012	Yes	Pacific fisher, ringtail cat, black bear, blacktail deer
63A	25	4/13/2012	5/18/2012	No	coyote, opossum
63B	25	4/13/2012	5/18/2012	Yes	Pacific fisher, coyote, raccoon, blacktail deer, turkey vulture
91A	24	5/25/2012	6/29/2012	No	black bear
91B	24	5/25/2012	6/29/2012	No	black bear, raccoon, turkey vulture
50A	18	7/13/2012	8/17/2012	No	Roosevelt elk, blacktail deer, black bear, gray fox
50B	18	7/13/2012	8/17/2012	No	Roosevelt elk, blacktail deer, bobcat, coyote
19A	1	8/8/2012	9/12/2012	No	black bear
19B	1	8/8/2012	9/12/2012	No	black bear, bobcat
53A	2	10/11/2012	11/15/2012	No	black bear
53B	2	10/11/2012	11/15/2012	No	none
88A	3	10/23/2012	11/27/2012	No	gray fox, blacktail deer, opossum, bobcat
88B	3	10/23/2012	11/27/2012	Yes	black bear, gray fox, Pacific fisher
71B	4	10/26/2012	11/30/2012	No	black bear, opossum, blacktail deer, spotted skunk
71A	4	10/26/2012	11/30/2012	Yes	black bear, gray fox, gray squirrel, blacktail deer, Roosevelt elk, coyote, Pacific fisher
110A	5	12/7/2012	1/11/2013	No	black bear
110B	5	12/7/2012	1/11/2013	No	blacktail deer, black bear, Stellers jay
40A	6	12/12/2012	1/16/2013	Yes	black bear, coyote, bobcat, Pacific fisher
40B	6	12/12/2012	1/16/2013	Yes	black bear, spotted skunk, gray fox, coyote, Pacific fisher
90A	7	12/18/2012	1/22/2013	Yes	Pacific fisher, ringtail cat, black bear, gray fox
90B	7	12/18/2012	1/22/2013	Yes	Pacific fisher
60A	8	1/22/2013	2/26/2013	No	none
60B	8	1/22/2013	2/26/2013	No	none
115A	9	2/4/2013	3/11/2013	No	wild pig, wild turkey, bobcat, coyote
115B	9	2/4/2013	3/11/2013	No	wild pig, bobcat
92A	11	2/5/2013	3/12/2013	No	gray fox, spotted skunk
92B	11	2/5/2013	3/12/2013	Yes	Pacific fisher
97B	10	2/6/2013	3/13/2013	No	none

Unit	Order	Setup Date	Pull Date	Fisher Detections	Species Detected
97A	10	2/6/2013	3/13/2013	Yes	Pacific fisher, mountain lion
6A	12	3/5/2013	4/9/2013	No	gray jay
6B	12	3/5/2013	4/9/2013	No	gray jay, turkey vulture, common raven
20A	13	3/20/2013	4/24/2013	Yes	Pacific fisher, bobcat, black bear
20B	13	3/20/2013	4/24/2013	Yes	Pacific fisher
27A	14	3/20/2013	4/24/2013	Yes	Pacific fisher, bobcat, black bear
27B	14	3/20/2013	4/24/2013	Yes	Pacific fisher, black bear
20B	13	3/20/2013	4/24/2013	No	black bear, bobcat, blacktail deer
85A	16	5/14/2013	6/18/2013	No	black bear
85B	16	5/14/2013	6/18/2013	Yes	Pacific fisher, black bear, coyote, mountain lion
3A	19	7/31/2013	9/4/2013	No	black bear
3B	19	7/31/2013	9/4/2013	No	black bear
44A	18	8/12/2013	9/16/2013	No	black bear
44B	18	8/12/2013	9/16/2013	No	black bear, Roosevelt elk
56A	20	9/17/2013	10/22/2013	No	none
56B	20	9/17/2013	10/22/2013	No	black bear, coyote, gray fox, spotted skunk, turkey vulture, common raven
47A	22	9/19/2013	10/24/2013	No	dog (Lab), blacktail deer, opossum
47B	22	9/19/2013	10/24/2013	No	black bear
35A	23	10/15/2013	11/19/2013	No	raccoon, coyote
35B	23	10/15/2013	11/19/2013	No	blacktail deer, black bear
51A	25	11/11/2013	12/16/2013	No	bobcat, raccoon, opossum
51B	25	11/11/2013	12/16/2013	No	dogs, bobcat, coyote, blacktail deer, raccoon, opossum
18B	1	11/13/2013	12/18/2013	Yes	Pacific fisher, gray squirrel, blacktail deer, bobcat
18A	1	11/13/2013	12/18/2013	No	black bear, bobcat, varied thrush, gray squirrel
98A	24	11/19/2013	12/24/2013	No	blacktail deer, gray squirrel, coyote, opossum, black bear
98B	24	11/19/2013	12/24/2013	No	none
67A	2	11/21/2013	12/26/2013	No	blacktail deer, bobcat, Douglas' squirrel, least chipmunk
67B	2	11/21/2013	12/26/2013	No	blacktail deer, bobcat, coyote, mountain lion, gray fox
94A	4	11/22/2013	12/27/2013	No	blacktail deer
94B	4	11/22/2013	12/27/2013	No	black bear, blacktail deer, coyote, gray fox
59A	3	12/26/2013	1/30/2014	Yes	bobcat, Pacific fisher
59B	3	12/26/2013	1/30/2014	No	none
4A	5	1/3/2014	2/7/2014	No	none
4B	5	1/3/2014	2/7/2014	No	none
64A	6	1/6/2014	2/10/2014	No	gray fox, spotted skunk
64B	6	1/6/2014	2/10/2014	No	opossum

Unit	Order	Setup Date	Pull Date	Fisher Detections	Species Detected
45B	7	1/16/2014	2/20/2014	Yes	Pacific fisher, Douglas' squirrel, mouse spp.
45A	7	1/16/2014	2/20/2014	No	blacktail deer
109A	17	2/3/2014	3/10/2014	No	pig
109B	17	2/3/2014	3/10/2014	No	spotted skunk
32A	11	3/5/2014	3/25/2014	Yes	coyote, Pacific fisher
32B	11	3/5/2014	3/25/2014	Yes	blacktail deer, turkey vulture, Pacific fisher
55A	8	3/14/2014	4/18/2014	No	opossum
55B	8	3/14/2014	4/18/2014	No	none
83B	9	3/18/2014	4/23/2014	Yes	black bear, turkey vulture, blacktail deer, Pacific fisher
83A	9	3/18/2014	4/23/2014	No	mountain lion, spotted skunk, gray squirrel, mouse spp.
34B	10	3/25/2014	5/7/2014	No	black bear, gray fox, blacktail deer, domestic cow
117A	12	3/26/2014	4/30/2014	No	turkey vulture, black bear
117B	12	3/26/2014	4/30/2014	No	turkey vulture, black bear
34A	10	3/27/2014	5/8/2014	Yes	Ringtail cat, opossum, gray fox, Pacific fisher
89A	15	4/21/2014	5/26/2014	No	turkey vulture, black bear, blacktail deer
89B	15	4/22/2014	5/27/2014	No	none
37A	12	4/24/2014	5/29/2014	Yes	black bear, Pacific fisher
37B	12	4/24/2014	5/29/2014	Yes	black bear, Pacific fisher, gray jay
52A	18	5/8/2014	7/8/2014	No	black bear, blacktail deer, elk, coyote
52B	18	5/8/2014	7/8/2014	No	black bear, raccoon, spotted skunk, coyote
84A	20	5/19/2014	6/18/2014	Yes	Pacific fisher, black bear
104A	21	6/19/2014	7/28/2014	No	black bear, blacktail deer
104B	21	6/19/2014	7/28/2014	No	gray fox, blacktail deer, 2 blacktail deer fawns, black bear, black bear cub
100A	19	6/20/2014	8/15/2014	No	black bear, coyote, blacktail deer, turkey vulture, domestic cow
17A	17	6/25/2014	8/18/2014	No	black bear, turkey vulture
17B	17	6/25/2014	8/18/2014	No	mountain lion, black bear, turkey vulture, raccoon
100B	19	6/27/2014	8/6/2014	No	Ringtail cat, black bear
99A	24	7/18/2014	8/22/2014	No	black bear, coyote, gray fox, raccoon, turkey vulture, red-tailed hawk,
99B	24	7/18/2014	8/22/2014	No	black bear, gray fox, turkey vulture
86A	25	8/5/2014	9/9/2014	Yes	black bear, gray fox, Pacific fisher
86B	25	8/5/2014	9/9/2014	No	black bear, gray fox
54A	2	8/6/2014	9/10/2014	No	blacktail deer
54B	2	8/6/2014	9/10/2014	No	black bear
114A	1	8/27/2014	10/8/2014	No	gray squirrel, wild pig (piglet), black bear, opossum
114B	1	8/27/2014	10/8/2014	No	Douglas' squirrel, spotted skunk, opossum, black bear, striped skunk, mountain lion, gray fox, blacktail deer

Unit	Order	Setup Date	Pull Date	Fisher Detections	Species Detected
24A	3	9/4/2014	10/9/2014	No	black bear
24B	3	9/4/2014	10/9/2014	Yes	Pacific fisher
72A	4	9/9/2014	10/14/2014	Yes	black bear, gray squirrel, Pacific fisher
72B	4	9/9/2014	10/14/2014	No	gray fox, gray squirrel, black bear
16A	5	9/16/2014	10/21/2014	No	black bear
16B	5	9/16/2014	10/21/2014	No	gray fox, gray squirrel, blacktail deer
15A	6	9/29/2014	11/3/2014	No	black bear
15B	6	9/29/2014	11/3/2014	No	black bear, spotted skunk
76A	7	10/10/2014	11/14/2014	Yes	black bear, blacktail deer, spotted skunk, Pacific fisher
76B	7	10/10/2014	11/14/2014	Yes	blacktail deer, spotted skunk, coyote, bobcat, gray squirrel, Douglas' squirrel, Pacific fisher
41A	9	11/3/2014	12/8/2014	Yes	opossum, black bear, bobcat, Pacific fisher
41B	9	11/3/2014	12/8/2014	No	black bear, blacktail deer
75A	8	11/7/2014	12/12/2014	Yes	Pacific fisher, black bear
75B	8	11/7/2014	12/12/2014	No	none
11A	10	11/12/2014	12/17/2014	No	blacktail deer
11B	10	11/12/2014	12/17/2014	No	none
66A	11	12/19/2014	1/23/2015	No	opossum
66B	11	12/19/2014	1/23/2015	No	bobcat, mountain lion, black bear
31A	12	12/22/2014	1/26/2015	Yes	Pacific fisher
31B	12	12/22/2014	1/26/2015	No	none
43A	15	12/26/2014	1/30/2015	Yes	gray fox, Pacific fisher, blacktail deer
43B	15	12/26/2014	1/30/2015	Yes	Pacific fisher, blacktail deer
108A	15	4/13/2015	5/18/2015	No	none
108B	15	4/13/2015	5/18/2015	No	none
5A	16	4/13/2015	5/18/2015	No	black bear
5B	16	4/13/2015	5/18/2015	No	none
70A	18	4/13/2015	5/18/2015	No	none
70B	18	4/13/2015	5/18/2015	No	none
101A	17	5/13/2015	6/17/2015	No	none
101B	17	5/15/2015	6/19/2015	No	none

Error! Reference source not found. provides a comparison of results of the baseline (2000 - 2005) surveys and current (2010-2015) surveys. As discussed above, 86 of the 118 sample units have been resurveyed to date, with a total of 33 fisher detections. Nine sample units (1, 24, 27, 32, 37, 41, 43, 85, and 97) were occupied by fisher on the baseline and have also shown current occupancy (1.00 occupancy rate). Forty-five sample units had negative results on both the baseline and current survey. Interestingly, 24 sample units had negative results on the baseline survey, but had fisher detections on the current survey. Conversely, three units (11, 17, and 115) were occupied on the baseline survey, but did not have

fisher detections on the current survey. This seeming increase in detections may be related, at least in part, to the improvement in camera equipment, but bears further review and investigation as the current survey continues.

Table 6. Comparison of Baseline (2000 - 2005) and Current (2010 - 2015) Surveys.

Pacific fisher Sample Unit #	Pacific fisher detections 2000-2005 surveys	Pacific fisher detections 2010-2015 surveys
1	Yes	Yes
2	Yes	Not Surveyed
3	No	Not Surveyed
4	No	No
5	Yes	in progress
6	No	No
7	No	Yes
8	No	Not Surveyed
9	Yes	Not Surveyed
10	No	No
11	Yes	No
12	No	Not Surveyed
13	No	Not Surveyed
14	No	Not Surveyed
15	No	No
16	No	No
17	Yes	No
18	No	Yes
19	No	No
20	No	Yes
21	No	Not Surveyed
22	No	No
23	No	No
24	Yes	Yes
25	Yes	Not Surveyed
26	No	Not Surveyed
27	Yes	Yes
28	No	Yes
29	No	No
30	No	Not Surveyed
31	No	Yes
32	Yes	Yes

Pacific fisher Sample Unit #	Pacific fisher detections 2000-2005 surveys	Pacific fisher detections 2010-2015 surveys
33	No	No
34	No	Yes
35	No	No
36	No	Not Surveyed
37	Yes	Yes
38	No	Not Surveyed
39	No	Not Surveyed
40	No	Yes
41	Yes	Yes
42	No	No
43	Yes	Yes
44	No	No
45	No	Yes
46	No	Not Surveyed
47	No	No
48	No	Not Surveyed
49	No	Yes
50	No	No
51	No	No
52	No	Not Surveyed
53	No	No
54	No	No
55	No	No
56	No	No
57	No	Not Surveyed
58	No	No
59	No	Yes
60	No	No
61	No	No
62	No	Not Surveyed
63	No	Yes
64	No	No
65	No	Not Surveyed
66	No	No
67	No	No
68	No	Not Surveyed
69	No	Not Surveyed

70	No	in progress
Pacific fisher Sample Unit #	Pacific fisher detections 2000-2005 surveys	Pacific fisher detections 2010-2015 surveys
71	No	Yes
72	No	Yes
73	No	No
74	No	Not Surveyed
75	No	Yes
76	No	Yes
77	No	Not Surveyed
78	No	Not Surveyed
79	No	Not Surveyed
80	No	Yes
81	No	Yes
82	No	Not Surveyed
83	No	Yes
84	No	Yes
85	Yes	Yes
86	No	Yes
87	No	No
88	No	Yes
89	No	No
90	No	Yes
91	No	No
92	No	Yes
93	No	Not Surveyed
94	No	No
95	Yes	Not Surveyed
96	No	Yes
97	Yes	Yes
98	No	No
99	No	No
100	No	No
101	No	No
102	No	Not Surveyed
103	No	Not Surveyed
104	No	No
105	No	No
106	No	Not Surveyed

107	No	No
Pacific fisher Sample Unit #	Pacific fisher detections 2000-2005 surveys	Pacific fisher detections 2010-2015 surveys
108	No	No
109	No	No
110	No	Not Surveyed
111	No	No
112	No	No
113	No	Not Surveyed
114	No	No
115	Yes	No
116	No	No
117	No	No
118	Not Surveyed	Not Surveyed
119	No	Not Surveyed

HABITAT SUMMARY

Regarding maintenance of habitat for the Pacific fisher, the HCP states:

“Retention of late seral habitat on the ownership through the life of the permit is expected to provide sufficient habitat in terms of quantity, quality, and distribution to contribute to a viable population. Channel Migration Zones (CMZs) and Riparian Management Zones (RMZs) are expected to provide connectivity across the landscape. In many locations, CMZs and RMZs will intersect with other RMZs or be augmented by habitat subject to silvicultural restrictions (e.g. NSO activity sites, mass-wasting sites, or steep slopes adjacent to RMZs). These areas, MMCA, and adjoining public lands will form an interconnecting network of habitat which is expected to provide opportunities for denning and resting sites in the Humboldt, Yager, and Van Duzen WAAs. HRC land within the Bear, Mattole, and Eel WAAs is not expected to provide blocks of late seral habitat through the life of the permit. Late seral and old growth habitat on public lands adjacent to HRC ownership in these two WAAs is expected to provide suitable habitat for the species.

The conservation measures to retain and recruit habitat structural components within and outside of RMZs across the ownership is expected to provide older forest legacies in younger stands when these stands reach a mid-successional seral stage. These legacy components are expected to provide suitable substrate for Pacific fisher denning and resting sites.”

The quantity and distribution of late seral habitat as of January 2015, according to the most recent stand inventory information as cross-walked to California Wildlife Habitat Relationships System (CWHR) types, and thus seral stage for the Watershed Assessment Areas (WAAs), is shown in Table 7. HRC’s HCP commitment is to maintain at least 10% late seral of forested lands by WAA (HCP 6.11). CMZs, RMZs, NSO activity sites, mass-wasting sites, and steep slope areas are tracked separately through other HCP programs and applied on each Timber Harvesting Plan (THP). In addition, the retention and recruitment of habitat structural components are tracked via individual THPs.

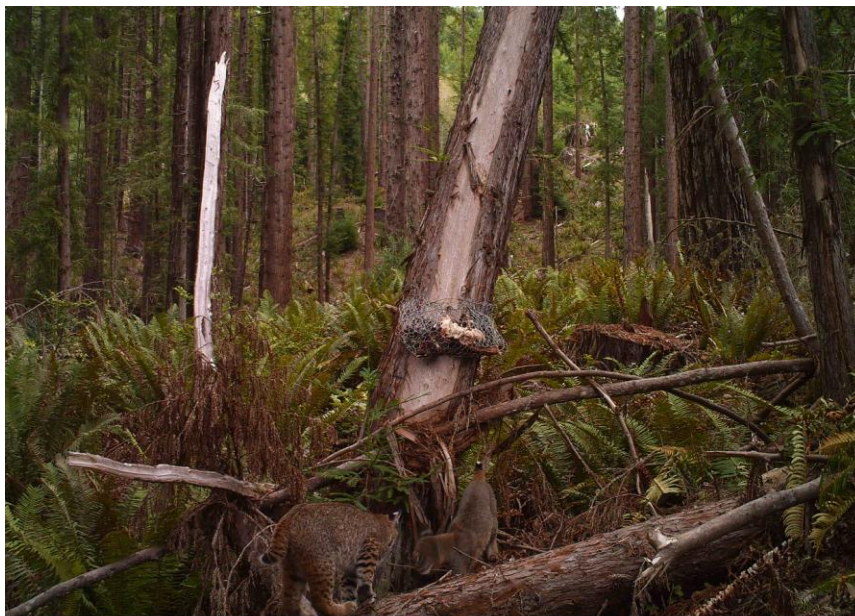
Pacific fisher habitat should also benefit over time as a result of the HRC conservation measure of retention of all old growth trees meeting the company’s policy, and use of uneven-aged silviculture, two additional measures not contemplated during the writing of the HCP and Biological Opinion. In addition, HRC continues to designate stands meeting the definition of High Conservation Value Forest (HCVF) according to the requirements of Forest Stewardship Council (FSC) certification, including an

approximately 200 acre late seral forest on the north side of Long Ridge in the North Fork of the Mattole River watershed.

Table 7. Seral Types by Watershed Assessment Area (WAA), Acres by Seral Type (not including Mad River).

WAA	Grass	Hardwood	Open	Young	Mid	Late	Totals	% Late Seral*
Humboldt Bay		413	211	11,472	15,541	10,690	38,327	27.89%
Yager Creek	89	529	839	17,150	10,877	4,538	34,021	13.34%
Van Duzen River	79	401	832	7,005	13,950	3,189	25,455	12.53%
Eel River	568	5,488	2,136	31,390	21,094	14,047	74,722	18.80%
Bear/Mattole River	3,309	8,927	551	6,171	3,681	12,044	34,683	34.73%
Total	4,217	17,051	4,576	73,560	65,728	45,402	210,534	

*Percent of forested lands (i.e., excluding grasslands, HCP 6.11.2.1)



Bushnell

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Figure 2. Pair of Bobcat at camera trap in Wolverton Gulch unit 41.

SUMMARY AND RECOMMENDATIONS

HRC will continue to use remote camera survey efforts over time in the study area (HCP lands) to develop an index of occupancy, and will continue to track habitat per WAA. The 2014 - 2015 survey season is year five of the current cycle of property-wide surveys. The current cycle should be completed by the 2015 - 2016 season (Table 4) when a complete resurvey of the property will be finished and a full comparison to the baseline can be done. No changes in monitoring strategy are proposed at this time.

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- Zielinski, W.J. and T.E. Kucera, editors. 1995. American marten, fisher, lynx and wolverine: survey methods for their detection. U.S. Forest Service General Technical Report PSW-GTR-157. 163 pp.