		Notes	January	February	March
North of Cape Falcon	Confirmed Sightings	Multiple sources (1986-2016)		4	9
	Acoustic Recorder	4 sites (2006-2011)[1]	22	21	29
		16 sites (2011-2016)[2]	Average monthly detection rates: 0.24, Westport Inshore = 1.75, We		
	Satellite Tag	% Time Spent[3]	49%	44%	74%
Cape Falcon to Humbug Mtn	Confirmed Sightings	Multiple sources (1986-2016)	3	1	1
	Acoustic Recorder	1 site (2006-2011)[1]		1	
		1 site (2011-2013)[2]			
	Satellite Tag	% Time Spent[3]	20%	23%	16%
Klamath Management Zone	Confirmed Sightings	Multiple sources (1986-2016)			
	Acoustic Recorder	1 site (2013-2015)[2]			
	Satellite Tag	% Time Spent[3]	12%	11%	8%
Humboldt South Jetty to Horse Mountain Area Closure	Confirmed Sightings	Multiple sources (1986-2016)			
	Acoustic Recorder				
	Satellite Tag	% Time Spent[3]	6%	6%	2%
Fort Bragg	Confirmed Sightings	Multiple sources (1986-2016)			1
	Acoustic Recorder	1 site (2006-2011)[1]		1	
		1 site (2011-2013)[2]			
	Satellite Tag	% Time Spent[3]	6%	8%	0%
San Francisco	Confirmed Sightings	Multiple sources (1986-2016)	2	2	1
	Acoustic Recorder	1 site (2006-2011)[1]		3	
		2 sites (2011-2015)[2]			
	Satellite Tag	% Time Spent[3]	8%	8%	0%
Monterey	Confirmed Sightings	Multiple sources (1986-2016)	2	2	3
	Acoustic Recorder				
	Satellite Tag	% Time Spent[3]	0%	0%	0%
Coast[4]	Acoustic Recorders	2005 - 2017	67	104	103

No sampling occurred

[1] Hanson et al. 2013

[2] Hanson et al. 2018

[3] % Time Spent is the percent of time K25/L84 spent in areas for each month (see Sat tag worksheet)

[4] see Acoustic recordes worksheet for summary of detections by month for each year in coastal waters (

April	May	June	July	August	September	October	November	December
5		2	1	1	2	2		
23	18	11						

WJDF = 0.91, Cape Flattery offshore = 0.28, Sand Point/Ozette =0.83, LaPush = 1.27, Quinault Inshore =
estport Mid Shelf = 0.58, Columbia R. North = 1.57, Columbia R. South 0.50

97%

2 1

2

0.72 average monthly detection rate

3%

0.18 average monthly detection rate

0%

1

0%

0.32 average monthly detection rate

0%

Average monthly detection rates: Point Reyes = 0.17 ; Sea Ranch = 0.00

0%

1

0%

99	82	37	10	5	18	26	25	9

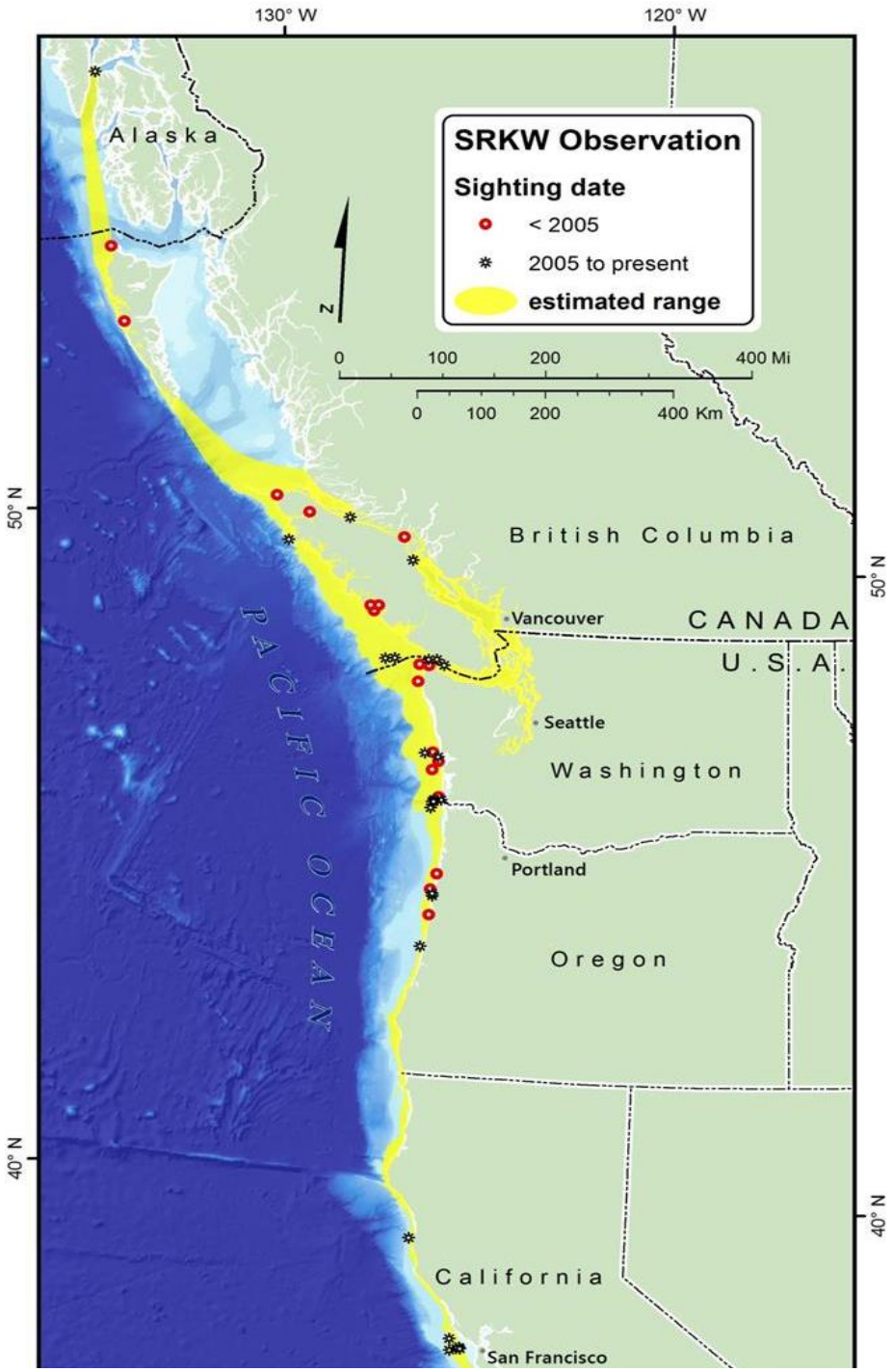
(all recorders combined)

Confirmed opportunistic coastal sightings of Southern Resident killer whales along the outer Pacific O

Date	Location	PFMC Management Area
4-Apr-86	Off Westport/Grays Harbor, WA	North of Cape Falcon
13-Sep-89	West of Cape Flattery, WA	North of Cape Falcon
17-Mar-96	3 km off Grays Harbor, WA	North of Cape Falcon
20-Sep-96	Off Sand Point, WA (29 km south of Cape Flattery)	North of Cape Falcon
Apr-99	Off Depoe Bay, OR	Cape Falcon to Humbug Mtn
29-Jan-00	Monterey Bay, CA	Monterey
21-Mar-00	Off Yaquina Bay, OR	Cape Falcon to Humbug Mtn
14-Apr-00	Off Depoe Bay, OR	Cape Falcon to Humbug Mtn
15-Apr-02	Long Beach, WA	North of Cape Falcon
13-Mar-03	Monterey Bay, CA	Monterey
11-Mar-04	Off Grays Harbor, WA	North of Cape Falcon
13-Mar-04	Off Cape Flattery, WA	North of Cape Falcon
16-Feb-05	Farallon Islands, CA	San Francisco
22-Mar-05	Fort Canby-North Head, WA	North of Cape Falcon
23-Oct-05	Off Columbia River	North of Cape Falcon
29-Oct-05	Off Columbia River	North of Cape Falcon
26-Jan-06	Pt. Reyes, CA	San Francisco
30-Mar-06	Off Columbia River	North of Cape Falcon
6-Apr-06	Off Westport, WA	North of Cape Falcon
24-Jan-07	Off San Francisco, CA	San Francisco
18-Mar-07	Off Fort Bragg, CA	Fort Bragg
24-25 Mar 2007	Monterey Bay, CA	Monterey
30-Oct-07	Bodega Bay, CA	San Francisco
27-Jan-08	Monterey Bay, CA and Cypress Point, Carmel Bay, CA	Monterey
2-Feb-08	Monterey Bay, CA	Monterey
31-Jul-08	Between Cape Alava and Cape Flattery, WA	North of Cape Falcon
21-Jan-09	Off Depoe Bay, OR	Cape Falcon to Humbug Mtn
24-Jan-09	Off Depoe Bay, OR	Cape Falcon to Humbug Mtn
5-Mar-09	Monterey Bay, CA	Monterey
7-Mar-09	Farallon Islands, CA	San Francisco
26-Mar-09	Off Westport, WA	North of Cape Falcon
27-Mar-09	Off Columbia River	North of Cape Falcon
4-Jun-09	Off WA coast west of Lake Ozette	North of Cape Falcon
24-Jan-10	3.2 mi west of Sea Lion Caves near Florence , OR	Cape Falcon to Humbug Mtn
15-Apr-10	Off Taholah, WA	North of Cape Falcon
10-Feb-11	Monterey Bay, CA	Monterey
14-Feb-11	Off San Francisco, CA	San Francisco
24-Mar-11	WA coast near Umatilla Reef	North of Cape Falcon
29-Apr-12	Off Westport, WA	North of Cape Falcon
21-May-12	Off Depoe Bay, OR	Cape Falcon to Humbug Mtn
15-Jun-12	WA coast, 20 nmi offshore of La Push	North of Cape Falcon

2-Aug-12	23 nm WNW of Cape Alava, WA	North of Cape Falcon
2-Feb-13	25 km southwest of Willapa Bay, WA	North of Cape Falcon
14-Feb-13	Off Yaquina Head Lighthouse, OR	Cape Falcon to Humbug Mtn
28-Apr-14	CA coast, 9 km west of Eel River mouth	Humbolt S Jetty to Horse Mtn
17-Feb-15	Off Cape Flattery, WA	North of Cape Falcon
23-Feb-16	Off La Push, WA	North of Cape Falcon
27-Feb-16	WA coast just north of Columbia River	North of Cape Falcon
7-Mar-16	Off Cape Flattery, WA	North of Cape Falcon

Figure 1 from Hanson et al. 2017. Locations of visual sightings of SRKW outside the Salish Sea during f




120° W

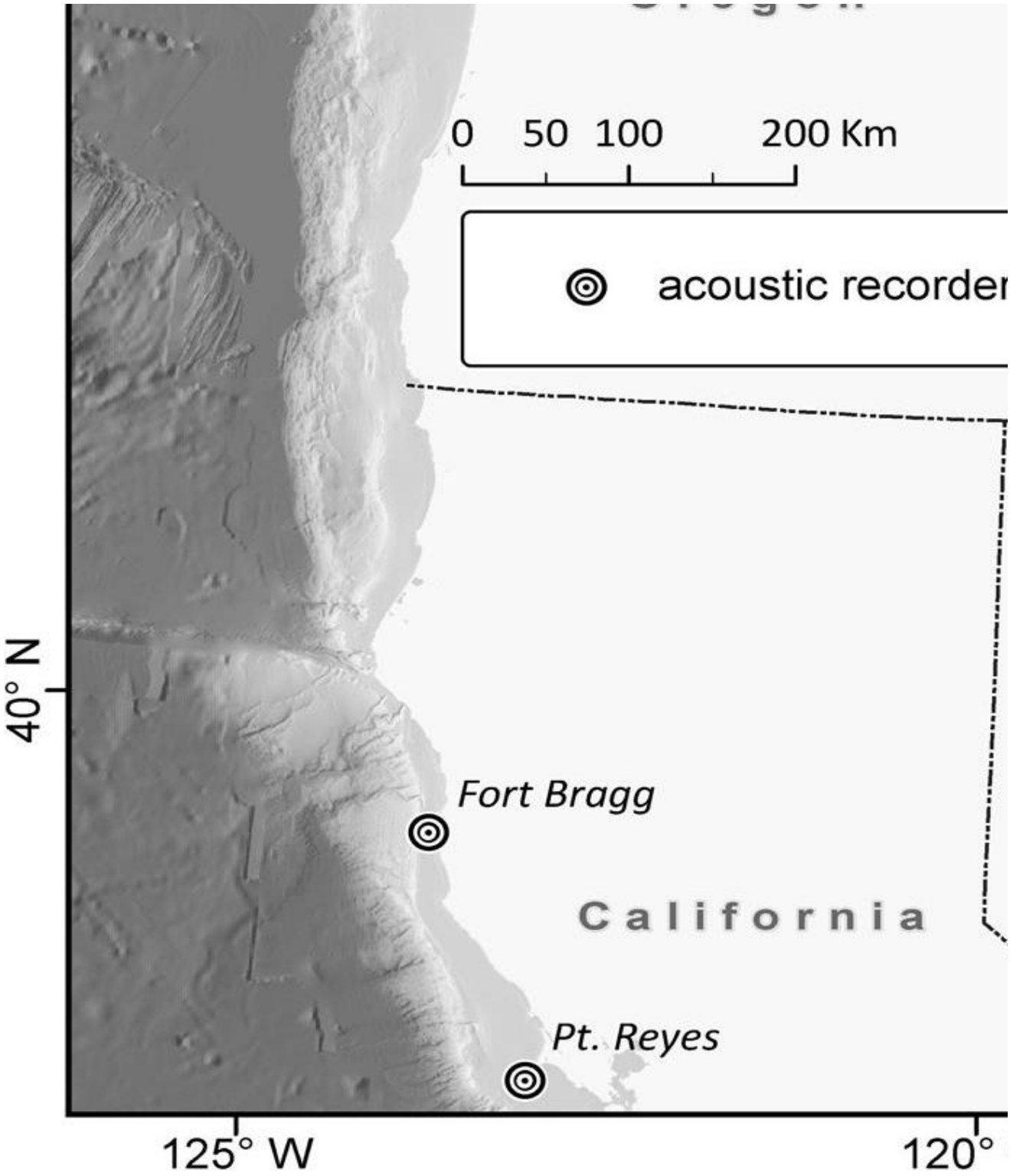
cean coast from California to Alaska, 1982-2016. Units of search effort are considered unknown

all, winter, and spring, from 1975 to 2016.

Acoustic detections by month/year indicates detections occurred throughout the year, each month. This tabl

Month	2005	2006	2007	2008	2009	2010
1	0	0	1	0	16	NA
2	0	2	4	0	26	NA
3	0	6	1	4	12	NA
4	0	0	0	6	13	NA
5	2	2	2	6	2	NA
6	0	2	4	4	0	NA
7	0	0	1	3	0	NA
8	0	0	0	0	0	NA
9	0	0	2	0	0	1
10	0	0	2	7	0	1
11	0	0	0	5	0	0
12	0	0	0	0	0	1

Figure 1 from Hanson et al. 2013. Locations of acoustic recorders from 2006-2011.

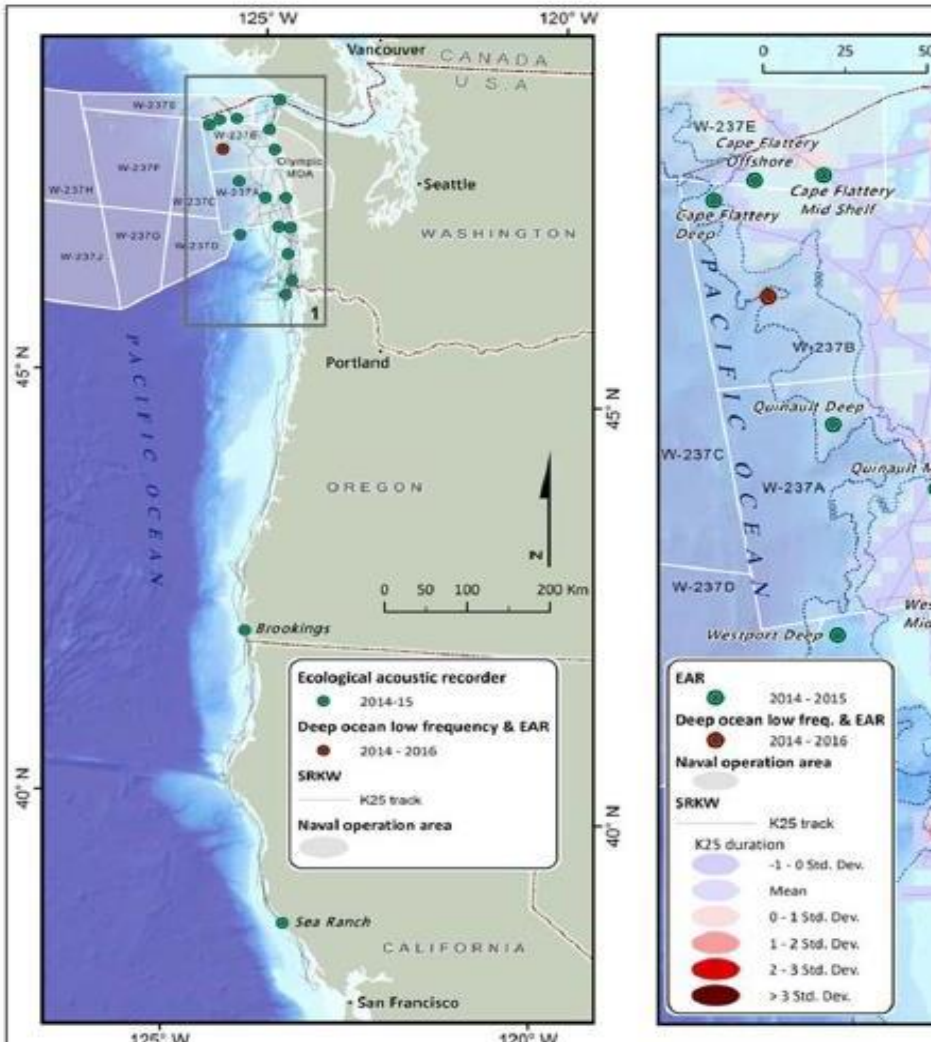

0 50 100 200 Km
acoustic recorder
40° N
Fort Bragg
California
Pt. Reyes
125° W
120°

e is not corrected for variable effort (recorders are deployed/recovered on different dates in each year and ha

2011	2012	2013	2014	2015	2016	2017
12	4	7	6	8	5	8
10	4	11	6	14	20	7
11	12	13	5	13	13	13
9	10	13	10	16	17	5
8	11	1	13	14	12	9
9	1	2	8	6	0	1
1	1	0	2	2	0	0
0	4	1	0	0	0	0
1	5	0	1	8	0	0
4	1	3	2	3	3	0
2	1	4	7	2	4	0
2	2	0	3	0	1	0

Figure 1 from Hanson et al. 2018

Figure 1. Locations of 2014 -2016 season acoustic recorders and 2013 track satellite-tagged SRKW K25 relative to Navy training ranges. Density 5x5 km cells based on duration of occurrence are shown in red.



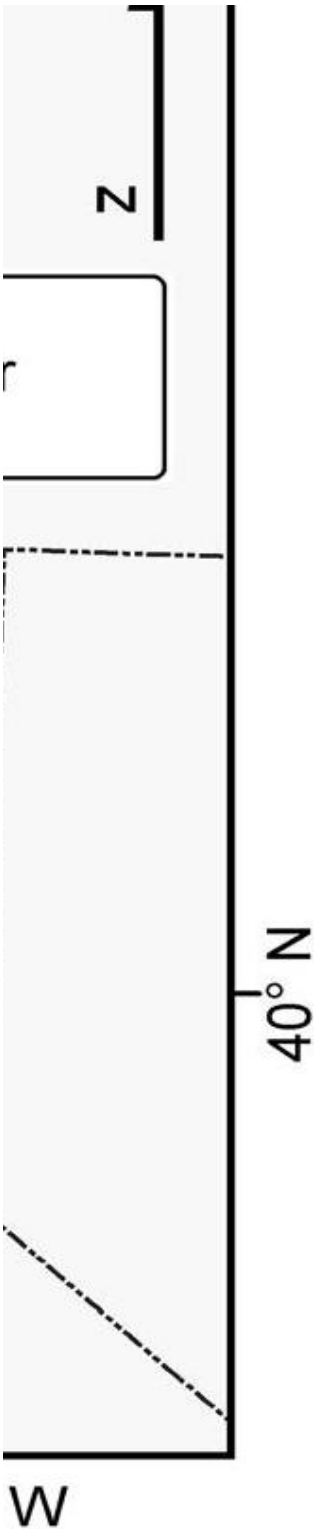


Table 2 from Hanson et al. 2018

Table 2. Acoustic recorder deployment effort, 2011-

Year		2011-2012			2012-201
	Start Date	End date	# days	Start Date	End date
Location					
Juan de Fuca					
Cape Flattery Inshore	01-Oct-11	04-Apr-12	187	22-Aug-12	30-Nov
Cape Flattery Midshelf					
Cape Flattery Offshore	01-Oct-11	22-Aug-12	327	22-Aug-12	01-Sep
Cape Flattery Deep					
Sand Point/Ozette					
La Push					
Quinault Inshore					
Quinault Midshelf					
Quinault Deep					
Westport Inshore	30-Sep-11	23-Aug-12	343	09-Nov-12	06-Jun
Westport Mid Shelf					
Westport Deep					
Willapa					
Columbia River North	30-Sep-11	22-Nov-11	53	09-Nov-12	19-Nov
Columbia River South					
Newport	13-Sep-11	14-Sep-12	368	14-Sep-12	05-Mar
Brookings					
Fort Bragg	27-Oct-11	12-Sep-12	322	12-Sep-12	20-Aug
Sea Ranch					
Point Reyes	24-Oct-11	12-Sep-12	325	12-Sep-12	12-Sep

Table 3 from Hanson et al. 2018

Table 3. Number of days with acoustic detections ('detection days') of SRK
2016.

Year	2011-12	2012-13	2013-14	2014-15	2015-
EAR Location					
Western Juan de Fuca			2	9	14
Cape Flattery Inshore	0	0			
Cape Flattery Midshelf				NR	0
Cape Flattery Offshore	3	6	2	1	3
Cape Flattery Deep				NR	ND
Sand Point/Ozette			9	7	ND
La Push				16	10
Quinault Inshore				4	1
Quinault Midshelf				NR	NR
Quinault Deep				0	0

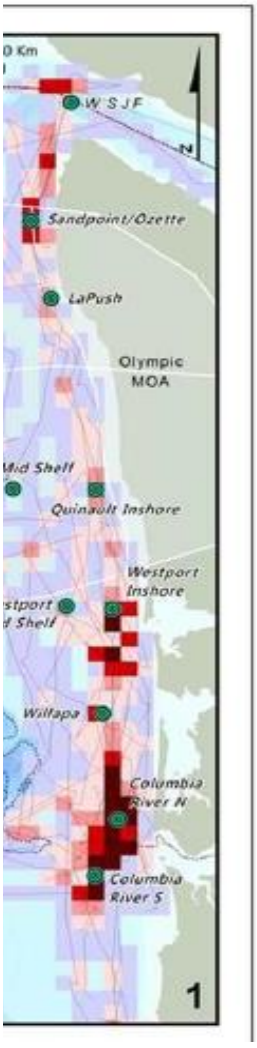
Westport Inshore	21	22	20	ND	11
Westport Mid Shelf				3	6
Westport Deep				NR	0
Willapa				ND	ND
Columbia River North	0	0	11	27	NR
Columbia River South			7	3	NR
Newport	7	6			
Brookings			3	1	
Fort Bragg	2	5			
Sea Ranch			0	0	
Point Reyes	4	0			
Total	37	39	54	71	

NR – Recorder not recovered ND- No data recovered Gray boxes – no recorder d

ave different acoustic sampling rates)

Total
67
104
103
99
82
37
10
5
18
26
25
9

t of
grid



-2016.

13			2013-2014			2014-2015			2015-2016	
e	# days	Start Date	End date	# days	Start Date	End date	# days	Start Date	End date	# days
		30-Oct-13	23-Jul-14	266	02-Oct-14	23-Jul-15	294	05-Sep-15	28-May-16	267
v-12	100									
o-13	374	30-Oct-13	01-Oct-14	336	02-Oct-14	15-Aug-15	317	05-Sep-15	12-Jun-16	282
								06-Sep-15	19-May-16	257
		30-Oct-13	17-Jul-14	260	02-Oct-14	15-Aug-15	317	05-Sep-15	08-Sep-15	3
					02-Oct-14	26-Jul-15	297	05-Sep-15	18-Jul-16	318
					31-Oct-14	23-Jul-15	265	05-Sep-15	20-Jul-16	365
					01-Nov-14	24-Jul-15	265	09-Mar-16	22-Apr-16	44
n-13	208	22-Oct-13	02-Jan-14	374	31-Oct-14	15-Nov-14	15	15-Sep-15	08-Aug-16	329
					31-Oct-14	23-Jul-15	265	08-Jan-16	28-Jul-16	202
								19-Mar-16	07-Sep-16	172
					31-Oct-14	11-Jan-15	72			
v-12	10	22-Oct-13	01-Oct-14	344	01-Nov-14	07-Sep-15	320			
		23-Oct-13	01-Nov-14	374	01-Nov-14	04-Jun-15	225			
r-13	171									
		23-Sep-13	27-Jan-14	126	31-Dec-14	01-Jun-15	200			
g-13	341	04-Feb-14	30-Dec-14	329						
		22-Sep-13	18-Oct-14	391	20-Nov-14	13-Oct-15	334			
o-13	364									

Table 4 from Hanson et al 2018

W, 2011-

-16	Total
	25
	0
	0
	15
)	NR/ND
)	16
)	26
	5
R	NR
	0

Table 4. Monthly detection rate of SRWK at each recorder location by year
2016.

Year	2011-12	2012-13	2013-14	2014-15	2015-16
EAR Location					
Western Juan de Fuca			0.23	0.92	1.57
Cape Flattery Inshore	0.00	0.00			
Cape Flattery Midshelf				NR	0.00
Cape Flattery Offshore	0.28	0.48	0.18	0.09	0.35
Cape Flattery Deep				NR	ND
Sand Point/Ozette			1.04	0.66	ND
La Push				1.62	0.94
Quinault Inshore				0.45	0.08
Quinault Midshelf				NR	NR
Quinault Deep				0.00	0.00

	74
	9
	0
	ND
	38
	10
	13
	4
	7
	0
	4
45	246

leployed

Quinault Deep					
Westport Inshore	1.84	3.17	1.60	ND	1.00
Westport Mid Shelf				0.34	0.89
Westport Deep				NR	0.00
Willapa				ND	ND
Columbia River North	0.00		0.96	2.53	NR
Columbia River South			0.56	0.40	NR
Newport	0.57	1.05			
Brookings			0.20	0.15	
Fort Bragg	0.19	0.44			
Sea Ranch			0.00	0.00	
Point Reyes	0.37	0.00			
Annual	0.58	0.75	0.58	0.67	0.60

NR – Recorder not recovered ND- No data recovered Gray boxes – no recorder d

; 2011-

Average
0.91
0.00
0.00
0.28
0.83
1.27
0.24
0.00

1.75
0.58
0.00
1.57
0.50
0.72
0.18
0.32
0.00
0.17

leployed

NMFS NWFSC deployed satellite-linked tags on SRKW between 2012 and 2016. -refer to Hanson et al. 2017 and
Each month in the table below has a density from K25 and L84 tags that sums to 1, and is further stratified by ar

	region	month	k25l84
1	North of Cape Falcon	1	0.494176
2	Cape Falcon to Humbug Mountair	1	0.195116
3	KMZ	1	0.117384
4	Horse Mountain to KMZ	1	0.05802
5	Fort Bragg	1	0.055556
6	San Francisco	1	0.079749
7	Monterey	1	0
8	North of Cape Falcon	2	0.435764
9	Cape Falcon to Humbug Mountair	2	0.225074
10	KMZ	2	0.109623
11	Horse Mountain to KMZ	2	0.064236
12	Fort Bragg	2	0.082837
13	San Francisco	2	0.082465
14	Monterey	2	0
15	North of Cape Falcon	3	0.740815
16	Cape Falcon to Humbug Mountair	3	0.160618
17	KMZ	3	0.082325
18	Horse Mountain to KMZ	3	0.016241
19	Fort Bragg	3	0
20	San Francisco	3	0
21	Monterey	3	0
22	North of Cape Falcon	4	0.971991
23	Cape Falcon to Humbug Mountair	4	0.028009
24	KMZ	4	0
25	Horse Mountain to KMZ	4	0
26	Fort Bragg	4	0
27	San Francisco	4	0
28	Monterey	4	0

Hanson et al. 2018
ea.