



Landbird Monitoring 2014 Annual Report

Channel Islands National Park

Natural Resource Data Series NPS/MEDN/NRDS—2015/975



ON THE COVER

Song Sparrow (*Melospiza melodia*) on San Miguel Island. Photo by Brad Sillasen with permission.

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The Natural Resource Data Series is intended for the timely release of basic data sets and data summaries. Care has been taken to assure accuracy of raw data values, but a thorough analysis and interpretation of the data has not been completed. Consequently, the initial analyses of data in this report are provisional and subject to change.

All manuscripts in the series receive the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner.

Data in this report were collected and analyzed using methods based on established, peer-reviewed protocols and were analyzed and interpreted within the guidelines of the protocols.

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Introduction

Channel Islands National Park (CHIS) comprises 5 of the 8 Channel Islands that lie off the coast of southern California. The park islands range in size from $<3 \text{ km}^2$ (Anacapa and Santa Barbara Islands) to $>200 \text{ km}^2$ (Santa Rosa and Santa Cruz Islands). Forty-five landbird species are known to breed regularly or occasionally on the park islands (Collins and Jones 2015) and 11 endemic bird taxa occur in the park (Johnson 1972, Coonan et al. 2011b, Collins and Jones 2015).

The National Park Service (NPS) began monitoring landbirds at CHIS in 1993 as part of its long-term ecological monitoring program for the park (Davis et al. 1994). Data were originally collected on line transects (van Riper III et al. 1988), until the program shifted to point count methods as a result of a program review in 2000 (McEachern 2000, Coonan et al. 2011a). The monitoring is conducted by CHIS staff, experienced interns and volunteers. The overall objective of the landbird monitoring program is to detect changes in the abundance and distribution of the breeding landbirds in the park (van Riper III et al. 1988, Coonan et al. 2011a).

This WASO I&M-approved data series report is a standardized and automated report run in R Code. In this report we summarize data collected during landbird monitoring in 2014.

Methods

In 2014, landbird monitoring at Channel Islands National Park was conducted on both line transects (as per van Riper et al. 1998) and point counts (as per Coonan et al. 2011a). Although the program sifted to point counts in 2002 and 2003, we retained the line transects on the smaller islands because they have great utility in lower-height vegetation communities and continual sampling of line transects allows us to evaluate landbird trends over a 20+ year time period. Monitoring of landbirds was conducted between March 05, 2014 and June 10, 2014. Tour dates are summarized in Table 1. Using distance-based sampling methods, we surveyed birds on 8 line transects (2 on Santa Barbara Island, 1 on East Anacapa Island, and 5 on San Miguel Island), and at 336 point count sites (25 on Santa Barbara, 8 on Anacapa, 118 on Santa Cruz, 145 on Santa Rosa, and 40 on San Miguel). In 2014, we began a second year of monitoring on Santa Cruz Island, at 100 point count sites established by R. C. Klinger of The Nature Conservancy in 1993, and at 10 point count sites we established using the method used by Klinger (1998) on East Santa Cruz Island. Access points to the plots were spaced 1/2 mile apart along the major roads and trails on the island, and a random compass bearing and distance (within 150 m) to the plot were selected at these access points. The data reported also include those from the 8 point counts monitored in the Prisoner's Harbor wetland restoration area for spring of 2014.

On transects, observers estimated the perpendicular distance from the transect midline to each bird detected. Similarly, on point counts, observers estimated the radial distance from the point to each bird detected. Counts were conducted for 10 minutes at each point count site. Observations began at sunrise and continued until four hours after sunrise. A total of 8 observers conducted landbird monitoring in 2014 (Appendix A).

The methodology used in 2014 did not deviate from the protocol (Coonan et al. 2011a), except for the following:

- The minimum visibility distance necessary to conduct monitoring was reduced from 400 m to 150 m. This is a matter of practicality; fog can often restrict visibility, but not necessarily detectability. Most birds are detected at distances <150 m. This change allows more point counts and transects to be monitored, particularly on San Miguel Island.

Data were entered into the CHIS Landbird Database and quality checked and verified for errors by program staff. Validation queries were run to highlight field values that were not consistent with expected results (i.e., out-of-range values). These values were double-checked against field datasheets and discrepancies were corrected as appropriate and/or noted in the database. All data collected in 2014 were verified, validated, and certified to ensure they are error-free to the greatest extent possible.

Table 1. Start and end dates of landbird monitoring survey tours on each island in 2014, with the number of line transects or 10-minute point counts listed for each tour.

Island	Start Date	End Date	# Transects	# Point Counts
Anacapa	03/12/2014	03/18/2014	1	8
Santa Barbara	03/05/2014	03/12/2014	2	25
Santa Cruz	03/21/2014	03/23/2014	0	8
Santa Cruz	03/25/2014	04/01/2014	0	102
Santa Cruz	04/02/2014	04/15/2014	0	8
Santa Cruz	05/10/2014	05/11/2014	0	9*
San Miguel	04/08/2014	04/22/2014	3	24
San Miguel	05/27/2014	06/10/2014	2	16
Santa Rosa	04/23/2014	04/30/2014	0	81
Santa Rosa	05/20/2014	05/27/2014	0	25
Santa Rosa	05/06/2014	05/13/2014	0	39

* Prisoners site (Santa Cruz Island) duplicate samples were not included in data calculations

Results

The total number of individuals of each species detected on all islands in 2014 is given in Table 2. Indices of abundance on point counts (number of birds counted and mean number of birds per station) are given for Anacapa Island (Table 3), Santa Barbara Island (Table 4), Santa Cruz Island (Table 5), San Miguel Island (Table 6), and Santa Rosa Island (Table 7). An index of abundance on transects is presented in Table 8.

Parkwide, the most commonly detected landbirds in 2014 were, in descending order, Song Sparrow, Orange-crowned Warbler, Spotted Towhee, Western Meadowlark, Bewick's Wren and Horned Lark (Table 2). The most common birds differed by island. Species that occurred at $\geq 33\%$ of point count sites included two on Anacapa Island (Song Sparrow, White-crowned Sparrow; Table 3); three on Santa Barbara Island (Horned Lark, Orange-crowned Sparrow and White-crowned Sparrow; Table 4); six on Santa Cruz Island (Bewick's Wren, Spotted Towhee, Northern Flicker, Orange-crowned Warbler, Island Scrub-Jay and Song Sparrow; Table 5); six on San Miguel Island (Song Sparrow, Orange-crowned Warbler, Western Meadowlark, Horned Lark, Common Raven, and House Finch; Table 6) and nine on Santa Rosa Island (Orange-

crowned Warbler, Western Meadowlark, Spotted Towhee, Bewick's Wren, Song Sparrow, Chipping Sparrow, Pacific-sloped Flycatcher, House Finch and Allen's Hummingbird; Table 7).

Line transect sampling was conducted on the smaller islands (Table 8). On the one East Anacapa Island transect, White - crowned Sparrows and Western Meadowlarks were the most common birds detected. For Santa Barbara Island (two transects), the most commonly detected birds were Horned Larks, Orange-crowned Sparrows and White-crowned Sparrows. On the five San Miguel Island transects, the most commonly detected birds were Song Sparrows, Orange-crowned Sparrows and Horned Larks.

Figures 1-5 present, for each species on each island, the mean number of birds per station in 2014 compared to the average number of birds per station in all years of sampling. On Anacapa Island, Orange-crowned Warblers were less abundant than in the past, whereas Song Sparrows and White-crowned sparrows were more abundant. Song Sparrows may have returned to regularly breeding on the island. On Santa Barbara Island, Western Meadowlarks were less abundant and Horned Larks and Orange-crowned Warblers were more abundant in 2014. Horned Larks and Orange-crowned Warblers were relatively more abundant on San Miguel Island, while Common Ravens and Song Sparrows were less abundant. Bewick's Wren, Orange-crowned Warblers, Song Sparrows, and Western Meadowlarks were more abundant on Santa Rosa Island; House Finches were less abundant on Santa Rosa in 2014.

The species richness graphics in Figure 6-10 summarize patterns of species occurrences on each island since 1993. This particular analysis includes data from both line transects and point counts, but does not include incidental observations of species that occurred outside of the formal line transect or 10-minute point counts (e.g., species observed while en route between counting stations are not included). These graphs can be used to determine whether species are appearing on or disappearing from the islands. On Anacapa Island, Yellow-rumped Warblers have not been detected during counts since 1996, European Starlings were last detected in 1998, and American Kestrels were last detected in 2001. On Santa Barbara Island, European Starlings were last detected in 1997, Burrowing Owls in 1995, Merlins in 1998; Lesser Goldfinch were first observed on Santa Barbara Island in 2014. On San Miguel Island, Wilson's Warblers first started showing up in 2006, and Townsend's Warblers began being detected on counts in 2007. On Santa Rosa Island, Acorn Woodpeckers and Grasshopper Sparrows have been observed since 2006 and Blue-grey Gnatcatchers and Virginia Rail since 2009. Bushtits, which breed on neighboring Santa Cruz Island, have been detected since 2009, and may now be breeding on Santa Rosa. Sharp-shinned Hawk, Townsend's Solitaire, Warbling Vireo and Western Tanager were first observed during monitoring on Santa Rosa Island in 2014.

No non-native birds were observed during the landbird monitoring program surveys on any of the five park islands in 2014. However, anecdotal observations by park staff and others documented non-native birds on the islands in 2014 (Paul Collins, Santa Barbara Museum of Natural History, unpubl. data). There were regular sightings of Eurasian Collared Doves (*Streptopelia decaocto*) on all islands but Anacapa in 2014, and European Starlings were observed on Santa Rosa and Santa Cruz. A lone Black-billed Magpie (*Pica hudsonia*), a North American native heretofore unknown on the islands, was repeatedly observed in the ranch area of Santa Rosa Island. There was one sighting of a Scaly-breasted Munia (*Lonchura punctulata*) on Santa Cruz Island. A Rock Pigeon (*Columba livia*) was observed on Santa Barbara Island in

late 2014, and a number were observed on Santa Cruz throughout the year. A House Sparrow (*Passer domesticus*) was observed on Santa Cruz in April.

Table 2. Number of individuals of each species detected during bird surveys on all islands in 2014. Data include detections on both line transects and point counts, and do not include birds observed before or after the counts.

Common Name	Scientific Name	Total # Detected	Anacapa	Santa Barbara	Santa Cruz	San Miguel	Santa Rosa
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	28			24		4
Allen's Hummingbird	<i>Selasphorus sasin</i>	95			19	7	69
American Kestrel	<i>Falco sparverius</i>	12		9	3		
American Robin	<i>Turdus migratorius</i>	1			1		
Anna's Hummingbird	<i>Calypte anna</i>	57			18	4	35
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	5			5		
Bald Eagle	<i>Haliaeetus leucocephalus</i>	2					2
Barn Owl	<i>Tyto alba</i>	2				1	1
Barn Swallow	<i>Hirundo rustica</i>	27			13	3	11
Bewick's Wren	<i>Thryomanes bewickii</i>	456	5		176		275
Black Phoebe	<i>Sayornis nigricans</i>	17	2		12		3
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	10			6		4
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	25			24		1
Bushtit	<i>Psaltiriparus minimus</i>	32			24		8
California Quail	<i>Callipepla californica</i>	57			44		13
Chipping Sparrow	<i>Spizella passerina</i>	168		2	25	1	140
Common Raven	<i>Corvus corax</i>	299			82	122	95
Common Yellowthroat	<i>Geothlypis trichas</i>	3			2		1
Cooper's Hawk	<i>Accipiter cooperii</i>	1			1		
Dark-eyed Junco	<i>Junco hyemalis</i>	7			6		1
Fox Sparrow	<i>Passerella iliaca</i>	12			12		
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	11		1	5	5	
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	11			3	6	2
Hermit Thrush	<i>Catharus guttatus</i>	8			7		1
Horned Lark	<i>Eremophila alpestris</i>	358		216	6	110	26
House Finch	<i>Carpodacus mexicanus</i>	297	1	9	92	51	144
Hutton's Vireo	<i>Vireo huttoni</i>	45			33		12
Island Scrub-Jay	<i>Aphelocoma insularis</i>	113			113		
Lesser Goldfinch	<i>Carduelis psaltria</i>	88		1	21	2	64
Loggerhead Shrike	<i>Lanius ludovicianus</i>	11			1		10
Mallard	<i>Anas platyrhynchos</i>	7			7		
Mourning Dove	<i>Zenaida macroura</i>	5			4	1	
Northern Flicker	<i>Colaptes auratus</i>	100			100		
Northern Harrier	<i>Circus cyaneus</i>	4		2	1	1	

Common Name	Scientific Name	Total # Detected	Anacapa	Santa Barbara	Santa Cruz	San Miguel	Santa Rosa
Northern Mockingbird	<i>Mimus polyglottos</i>	24			6		18
Orange-crowned Warbler	<i>Vermivora celata</i>	633	9	43	107	193	281
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	156			10		146
Peregrine Falcon	<i>Falco peregrinus</i>	4		2	1		1
Red-breasted Nuthatch	<i>Sitta canadensis</i>	1					1
Red-tailed Hawk	<i>Buteo jamaicensis</i>	12			2	3	7
Rock Wren	<i>Salpinctes obsoletus</i>	26	3	5	4	6	8
Ruby-crowned Kinglet	<i>Regulus calendula</i>	14			14		
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	50			50		
Savannah Sparrow	<i>Passerculus sandwichensis</i>	13		8	3		2
Say's Phoebe	<i>Sayornis saya</i>	9		7	2		
Sharp-shinned Hawk	<i>Accipiter striatus</i>	3			1	1	1
Song Sparrow	<i>Melospiza melodia</i>	708	10		116	225	357
Spotted Towhee	<i>Pipilo maculatus</i>	569			204		365
Townsend's Solitaire	<i>Myadestes townsendi</i>	1					1
Townsend's Warbler	<i>Dendroica townsendi</i>	3					3
Vaux's Swift	<i>Chaetura vauxi</i>	5			5		
Virginia Rail	<i>Rallus limicola</i>	2					2
Warbling Vireo	<i>Vireo gilvus</i>	3					3
Western Meadowlark	<i>Sturnella neglecta</i>	543	13	28	74	115	313
Western Tanager	<i>Piranga ludoviciana</i>	2			1		1
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	111	35	37	33	6	
White-throated Swift	<i>Aeronautes saxatalis</i>	1					1
Wilson's Warbler	<i>Wilsonia pusilla</i>	4				2	2
Yellow-rumped Warbler	<i>Dendroica coronata</i>	8		1	4		3

Table 3. Anacapa Island point-count sampling results: number of individuals detected, mean per station and standard error, frequency (number of stations) and percent of stations detected for bird species recorded in 2014 (8 stations).

Species	Common Name	#Detected	Mean per Stn	S.E.	# Stns	% Stns
BEWR	Bewick's Wren	4	0.50	0.39	2	25.0
BLPH	Black Phoebe	2	0.25	0.19	2	25.0
HOFI	House Finch	1	0.12	0.16	1	12.5
OCWA	Orange-crowned Warbler	3	0.38	0.32	2	25.0
ROWR	Rock Wren	2	0.25	0.19	2	25.0
SOSP	Song Sparrow	5	0.62	0.43	3	37.5
WEME	Western Meadowlark	3	0.38	0.47	1	12.5
WCSP	White-crowned Sparrow	9	1.12	0.88	3	37.5

Table 4. Santa Barbara Island point-count sampling results: number of individuals detected, mean per station and standard error, frequency (number of stations) and percent of stations detected for bird species recorded in 2014 (25 stations).

Species	Common Name	#Detected	Mean per Stn	S.E.	# Stns	% Stns
AMKE	American Kestrel	7	0.28	0.21	2	8
GCSP	Golden-crowned Sparrow	1	0.04	0.04	1	4
HOLA	Horned Lark	148	5.92	0.77	23	92
HOFI	House Finch	6	0.24	0.12	4	16
LEGO	Lesser Goldfinch	1	0.04	0.04	1	4
NOHA	Northern Harrier	1	0.04	0.04	1	4
OCWA	Orange-crowned Warbler	26	1.04	0.32	10	40
PEFA	Peregrine Falcon	2	0.08	0.06	2	8
ROWR	Rock Wren	4	0.16	0.16	1	4
SAVS	Savannah Sparrow	5	0.20	0.12	3	12
SAPH	Say's Phoebe	6	0.24	0.09	6	24
WEME	Western Meadowlark	24	0.96	0.33	8	32
WCSP	White-crowned Sparrow	23	0.92	0.32	9	36

Table 5. Number of individuals detected, mean per station and standard error, frequency (number of stations) and percent of stations detected for bird species recorded during point count sampling on Santa Cruz Island in 2014 (118 stations).

Species	Common Name	#Detected	Mean per Stn	S.E.	# Stns	% Stns
ACWO	Acorn Woodpecker	24	0.19	0.05	15	12.0
ALHU	Allen's Hummingbird	18	0.14	0.04	15	12.0
AMKE	American Kestrel	1	0.01	0.01	1	0.8
AMRO	American Robin	1	0.01	0.01	1	0.8
ANHU	Anna's Hummingbird	15	0.12	0.03	13	10.4
ATFL	Ash-throated Flycatcher	5	0.04	0.02	4	3.2
BARS	Barn Swallow	13	0.10	0.06	5	4.0
BEKI	Belted Kingfisher	1	0.01	0.01	1	0.8
BEWR	Bewick's Wren	176	1.41	0.11	94	75.2
BHGR	Black-headed Grosbeak	6	0.05	0.02	6	4.8
BLPH	Black Phoebe	12	0.10	0.03	9	7.2

Species	Common Name	#Detected	Mean per Stn	S.E.	# Stns	% Stns
BGGN	Blue-gray Gnatcatcher	24	0.19	0.05	17	13.6
BUSH	Bushtit	24	0.19	0.08	7	5.6
CAQU	California Quail	44	0.35	0.08	26	20.8
CHSP	Chipping Sparrow	20	0.16	0.05	15	12.0
CORA	Common Raven	68	0.54	0.16	31	24.8
COYE	Common Yellowthroat	2	0.02	0.01	2	1.6
COHA	Cooper's Hawk	1	0.01	0.01	1	0.8
DEJU	Dark-eyed Junco	6	0.05	0.03	4	3.2
FOSP	Fox Sparrow	12	0.10	0.04	7	5.6
GCSP	Golden-crowned Sparrow	5	0.04	0.03	3	2.4
GRSP	Grasshopper Sparrow	3	0.02	0.01	3	2.4
HETH	Hermit Thrush	7	0.06	0.02	7	5.6
HOLA	Horned Lark	6	0.05	0.02	5	4.0
HOFI	House Finch	79	0.63	0.17	33	26.4
HUVI	Hutton's Vireo	33	0.26	0.05	28	22.4
ISJA	Island Scrub-Jay	113	0.90	0.09	65	52.0
LEGO	Lesser Goldfinch	20	0.16	0.04	14	11.2
LOSH	Loggerhead Shrike	1	0.01	0.01	1	0.8
MALL	Mallard	7	0.06	0.04	2	1.6
MODO	Mourning Dove	4	0.03	0.02	3	2.4
NOFL	Northern Flicker	100	0.80	0.08	66	52.8
NOMO	Northern Mockingbird	6	0.05	0.02	6	4.8
OCWA	Orange-crowned Warbler	107	0.86	0.09	66	52.8
PSFL	Pacific-slope Flycatcher	10	0.08	0.03	9	7.2
PEFA	Peregrine Falcon	1	0.01	0.01	1	0.8
ROWR	Rock Wren	4	0.03	0.02	2	1.6
RCKI	Ruby-crowned Kinglet	14	0.11	0.04	11	8.8
RCSP	Rufous-crowned Sparrow	50	0.40	0.07	32	25.6
SAVS	Savannah Sparrow	3	0.02	0.01	3	2.4
SAPH	Say's Phoebe	2	0.02	0.01	2	1.6
SSHA	Sharp-shinned Hawk	1	0.01	0.01	1	0.8
SOSP	Song Sparrow	116	0.93	0.11	61	48.8
SPTO	Spotted Towhee	204	1.63	0.11	104	83.2
VASW	Vaux's Swift	5	0.04	0.04	1	0.8
WEME	Western Meadowlark	74	0.59	0.12	29	23.2
WETA	Western Tanager	1	0.01	0.01	1	0.8
WCSP	White-crowned Sparrow	33	0.26	0.11	12	9.6
YRWA	Yellow-rumped Warbler	1	0.01	0.01	1	0.8

Table 6. Number of individuals detected, mean per station and standard error, frequency (number of stations) and percent of stations detected for bird species recorded during point count sampling on San Miguel Island in 2014 (40 stations).

Species	Common Name	#Detected	Mean per Stn	S.E.	# Stns	% Stns
ALHU	Allen's Hummingbird	7	0.18	0.09	5	12.5
ANHU	Anna's Hummingbird	1	0.02	0.02	1	2.5
BARS	Barn Swallow	1	0.02	0.02	1	2.5
CHSP	Chipping Sparrow	1	0.02	0.02	1	2.5
CORA	Common Raven	31	0.78	0.16	20	50.0
GCSP	Golden-crowned Sparrow	4	0.10	0.10	1	2.5
HOLA	Horned Lark	67	1.68	0.31	23	57.5
HOFI	House Finch	22	0.55	0.13	15	37.5
LEGO	Lesser Goldfinch	2	0.05	0.03	2	5.0
NOHA	Northern Harrier	1	0.02	0.02	1	2.5
OCWA	Orange-crowned Warbler	122	3.05	0.33	33	82.5
ROWR	Rock Wren	6	0.15	0.06	6	15.0
SSHA	Sharp-shinned Hawk	1	0.02	0.02	1	2.5
SOSP	Song Sparrow	123	3.08	0.25	39	97.5
WEME	Western Meadowlark	71	1.77	0.28	26	65.0
WCSP	White-crowned Sparrow	2	0.05	0.03	2	5.0
WIWA	Wilson's Warbler	1	0.02	0.02	1	2.5

Overall trends in the data are not readily apparent from the 2014 results, and are better revealed by long term trend analysis (Coonan et al. 2011b, Davidson et al. in prep.). One might expect some signature of the three-year drought that has affected the islands, as well as the rest of California, since 2012. However, a drought signature is not apparent in spring landbird abundance. Of the 32 island-species combinations with sufficient data (those with box-and-whisker plots in Figs. 1-5), 11 had 2014 abundance values above the longterm average, and only 5 had 2014 abundance values below the longterm average.

On the other hand, continued vegetation recovery on Santa Rosa, following removal of non-native ungulate grazers and browsers, may be apparent in some of the 2014 landbird data. A number of species had 2014 abundance estimates higher than their longterm averages. These included Bewick's Wren, Orange-crowned Warbler, Pacific-slope flycatcher, Song Sparrow, Spotted Towhee and Western Meadowlark (Fig. 5). These values may reflect continued recovery of the chaparral and coastal sage scrub habitats which these species prefer (Coonan et al 2011b). Only one species on Santa Rosa, the House Finch, had a 2014 abundance estimate lower than the longterm average. House Finch numbers on all islands have been extremely variable over time (T. Coonan, NPS, unpubl. data).

Table 7. Number of individuals detected, mean per station and standard error, frequency (number of stations) and percent of stations detected for bird species recorded during point count sampling on Santa Rosa Island in 2014 (145 stations).

Species	Common Name	#Detected	Mean per Stn	S.E.	# Stns	% Stns
ACWO	Acorn Woodpecker	4	0.03	0.01	4	2.8
ALHU	Allen's Hummingbird	69	0.48	0.06	48	33.1
ANHU	Anna's Hummingbird	32	0.22	0.04	26	17.9
BAEA	Bald Eagle	2	0.01	0.01	2	1.4
BAOW	Barn Owl	1	0.01	0.01	1	0.7
BARS	Barn Swallow	11	0.08	0.03	6	4.1
BEWR	Bewick's Wren	275	1.90	0.11	119	82.1
BHGR	Black-headed Grosbeak	4	0.03	0.02	2	1.4
BLPH	Black Phoebe	3	0.02	0.01	3	2.1
BGGN	Blue-gray Gnatcatcher	1	0.01	0.01	1	0.7
BUSH	Bushtit	8	0.06	0.03	3	2.1
CAQU	California Quail	13	0.09	0.03	9	6.2
CHSP	Chipping Sparrow	140	0.97	0.08	88	60.7
CORA	Common Raven	70	0.48	0.06	50	34.5
COYE	Common Yellowthroat	1	0.01	0.01	1	0.7
DEJU	Dark-eyed Junco	1	0.01	0.01	1	0.7
GRSP	Grasshopper Sparrow	2	0.01	0.01	2	1.4
HETH	Hermit Thrush	1	0.01	0.01	1	0.7
HOLA	Horned Lark	26	0.18	0.06	13	9.0
HOFI	House Finch	136	0.94	0.11	60	41.4
HUVI	Hutton's Vireo	12	0.08	0.03	10	6.9
LEGO	Lesser Goldfinch	60	0.41	0.07	34	23.4
LOSH	Loggerhead Shrike	10	0.07	0.02	9	6.2
NOMO	Northern Mockingbird	18	0.12	0.04	14	9.7
OCWA	Orange-crowned Warbler	281	1.94	0.10	127	87.6
PSFL	Pacific-slope Flycatcher	146	1.01	0.10	77	53.1
PEFA	Peregrine Falcon	1	0.01	0.01	1	0.7
RBNU	Red-breasted Nuthatch	1	0.01	0.01	1	0.7
RTHA	Red-tailed Hawk	6	0.04	0.02	5	3.4
ROWR	Rock Wren	8	0.06	0.03	5	3.4
SAVS	Savannah Sparrow	2	0.01	0.01	1	0.7
SSHA	Sharp-shinned Hawk	1	0.01	0.01	1	0.7
SOSP	Song Sparrow	357	2.46	0.18	115	79.3
SPTO	Spotted Towhee	365	2.52	0.13	125	86.2
TOSO	Townsend's Solitaire	1	0.01	0.01	1	0.7
TOWA	Townsend's Warbler	3	0.02	0.01	3	2.1
VIRA	Virginia Rail	2	0.01	0.01	2	1.4
WAVI	Warbling Vireo	3	0.02	0.02	1	0.7
WEME	Western Meadowlark	312	2.15	0.12	127	87.6
WETA	Western Tanager	1	0.01	0.01	1	0.7
WIWA	Wilson's Warbler	2	0.01	0.01	2	1.4
YRWA	Yellow-rumped Warbler	3	0.02	0.02	1	0.7

Table 8. Number of individuals of each species detected on line transects 2014.

Species	AN- TRLS	SB- ARCH	SB- SGNL	SM- HRRS	SM- LKBD	SM- NDVR	SM- SMHL	SM- WLLW
American Kestrel		1	1					
Anna's Hummingbird						1		1
Barn Swallow								2
Bewick's Wren	1							
Chipping Sparrow			2					
Common Raven				4	5	2	3	11
Golden-crowned Sparrow								1
Grasshopper Sparrow					6			
House Finch			2		3	3		15
Horned Lark		22	46	2	24		11	2
Northern Harrier			1					
Orange-crowned Warbler	6	10	6	10	11	15	5	30
Rock Wren	1		1					
Say's Phoebe			1					
Savannah Sparrow		1	2					
Song Sparrow	5			26	29	8	11	28
Unknown Species					2			
White-crowned Sparrow	26	9	5					4
Western Meadowlark	10	4			28	2	13	1
Wilson's Warbler					1			
Yellow-rumped Warbler		1						

TRLS=trails, ARCH=Arch Point, SGNL=Signal, HRRS=Harris Point, LKBD=Lakebed, NDVR=Nidever, SMHL=San Miguel Hill, WLLW=Willow.

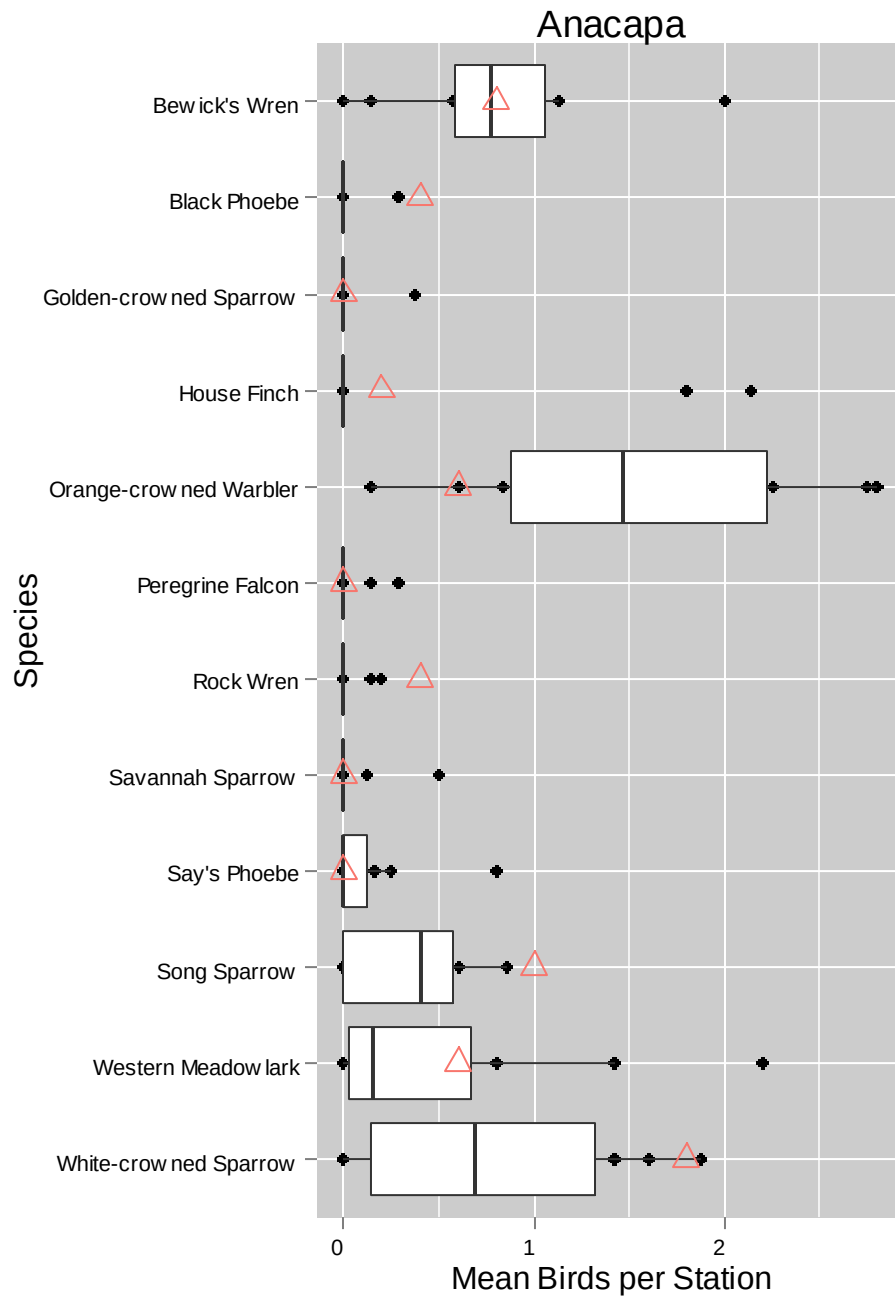


Figure 1. Mean birds per station for species detected on Anacapa Island in 2014, compared to means for previous years. The triangle shows the mean value for 2014. Boxplots for each species summarize data for past years.

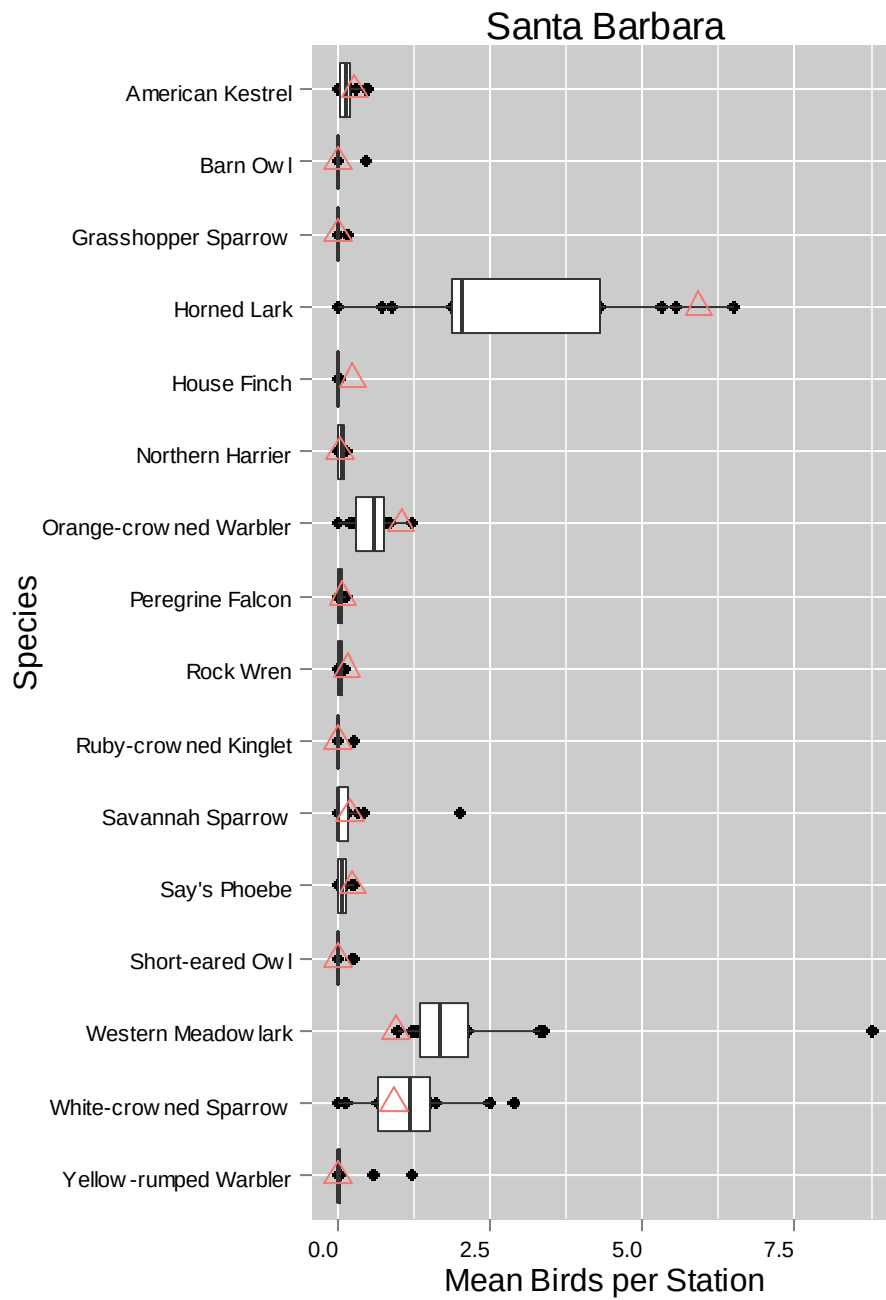


Figure 2. Mean birds per station for species detected on Santa Barbara Island in 2014, compared to means for previous years. The triangle shows the mean value for 2014. Boxplots for each species summarize data for past years.

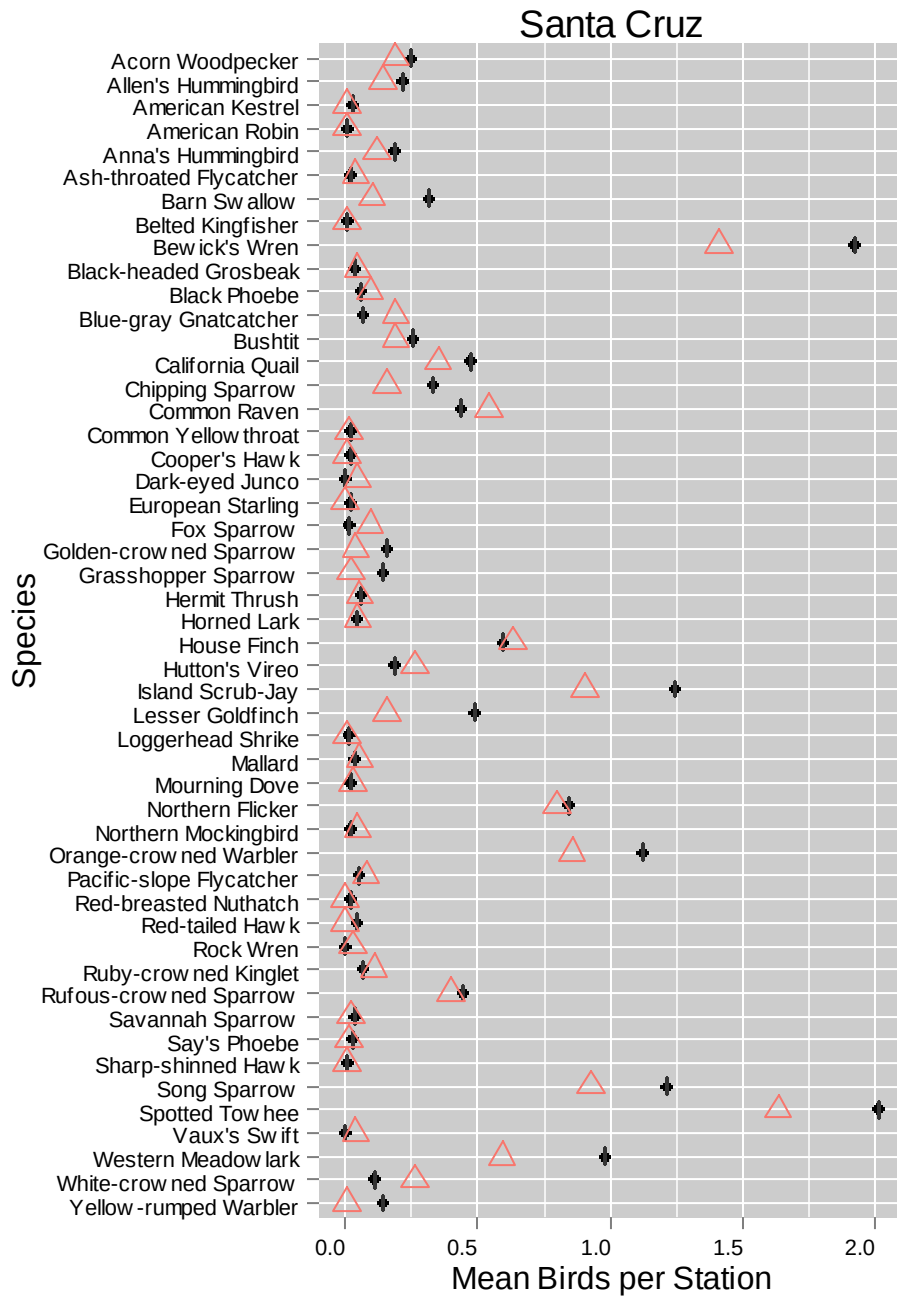


Figure 3. Mean birds per station for species detected on Santa Cruz Island in 2014, compared to means for previous years. The triangle shows the mean value for 2014. Boxplots for each species summarize data for past years.

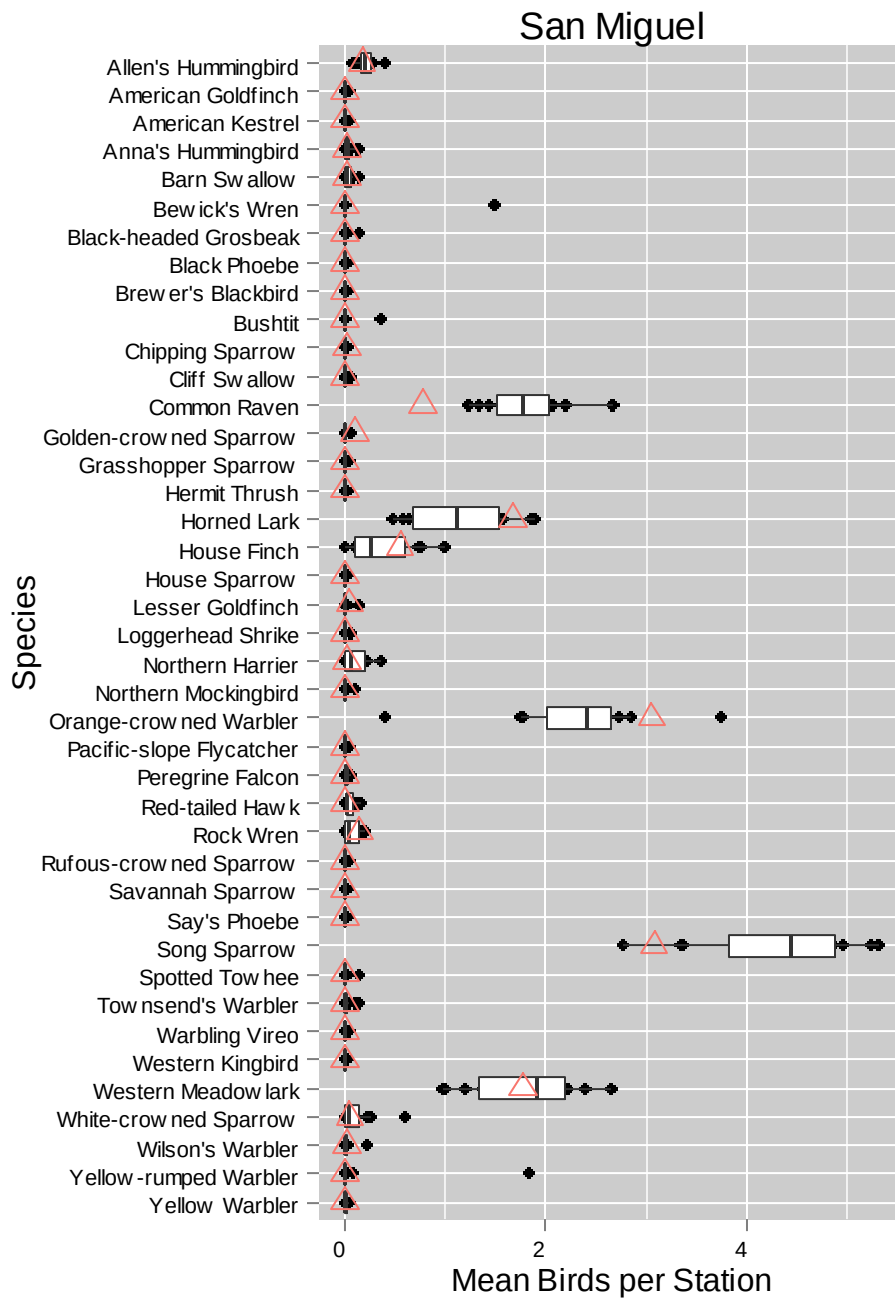


Figure 4. Mean birds per station for species detected on San Miguel Island in 2014, compared to means for previous years. The triangle shows the mean value for 2014. Boxplots for each species summarize data for past years.

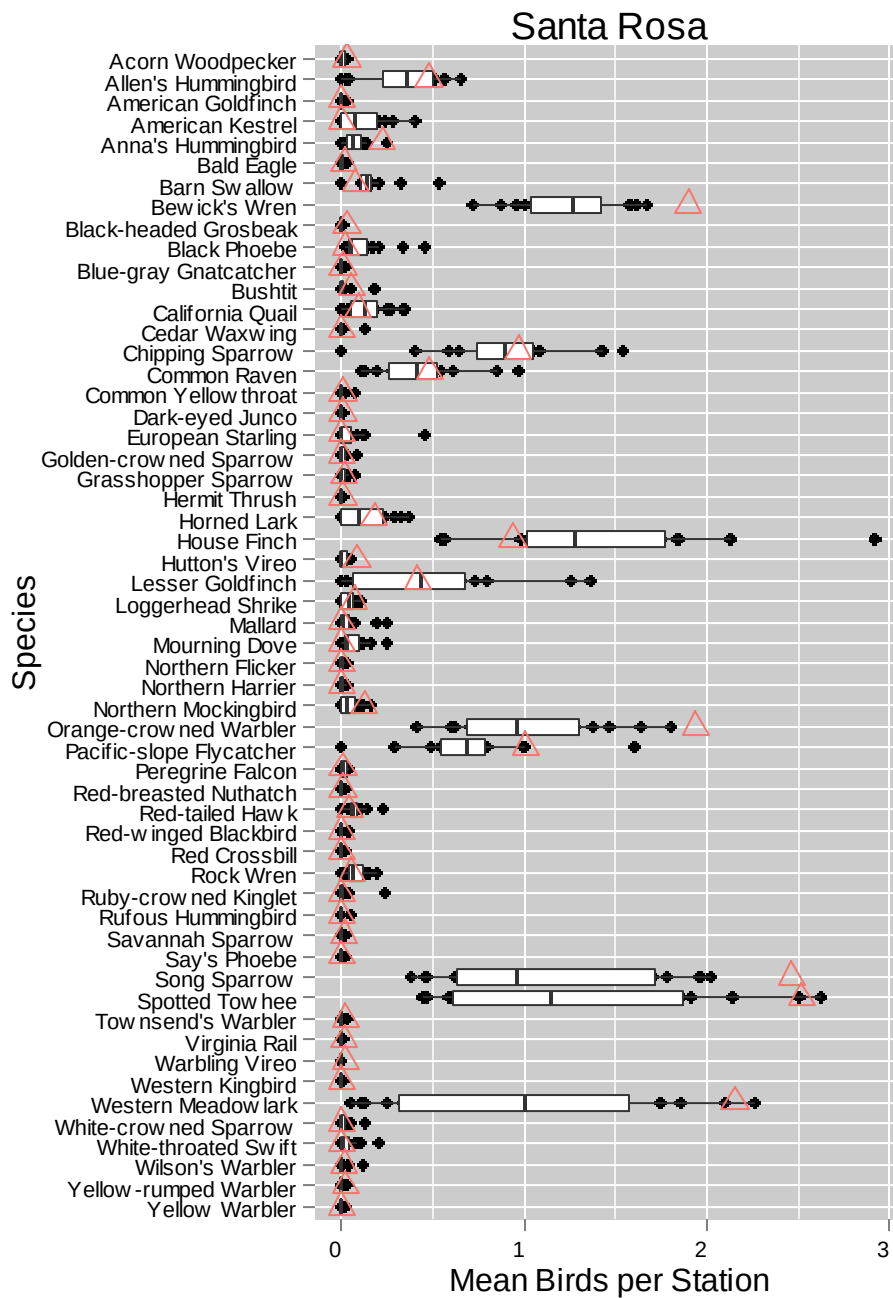


Figure 5. Mean birds per station for species detected on Santa Rosa Island in 2014, compared to means for previous years. The triangle shows the mean value for 2014. Boxplots for each species summarize data for past years.

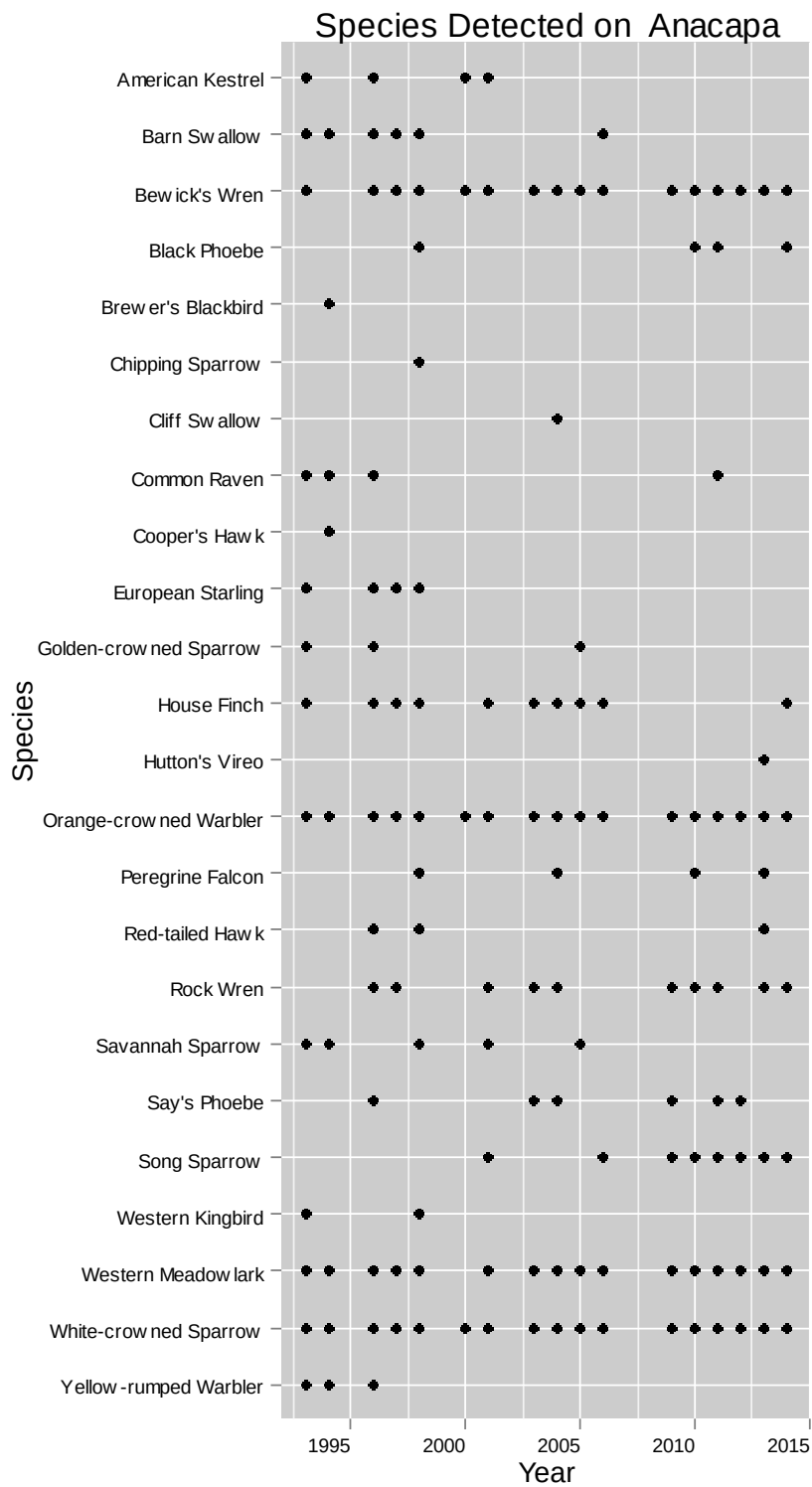


Figure 6. Species occurrence from 1993 –2014 for Anacapa Island. A dot for a particular species and year indicates that the species was detected on either a line transect or point count during that year.

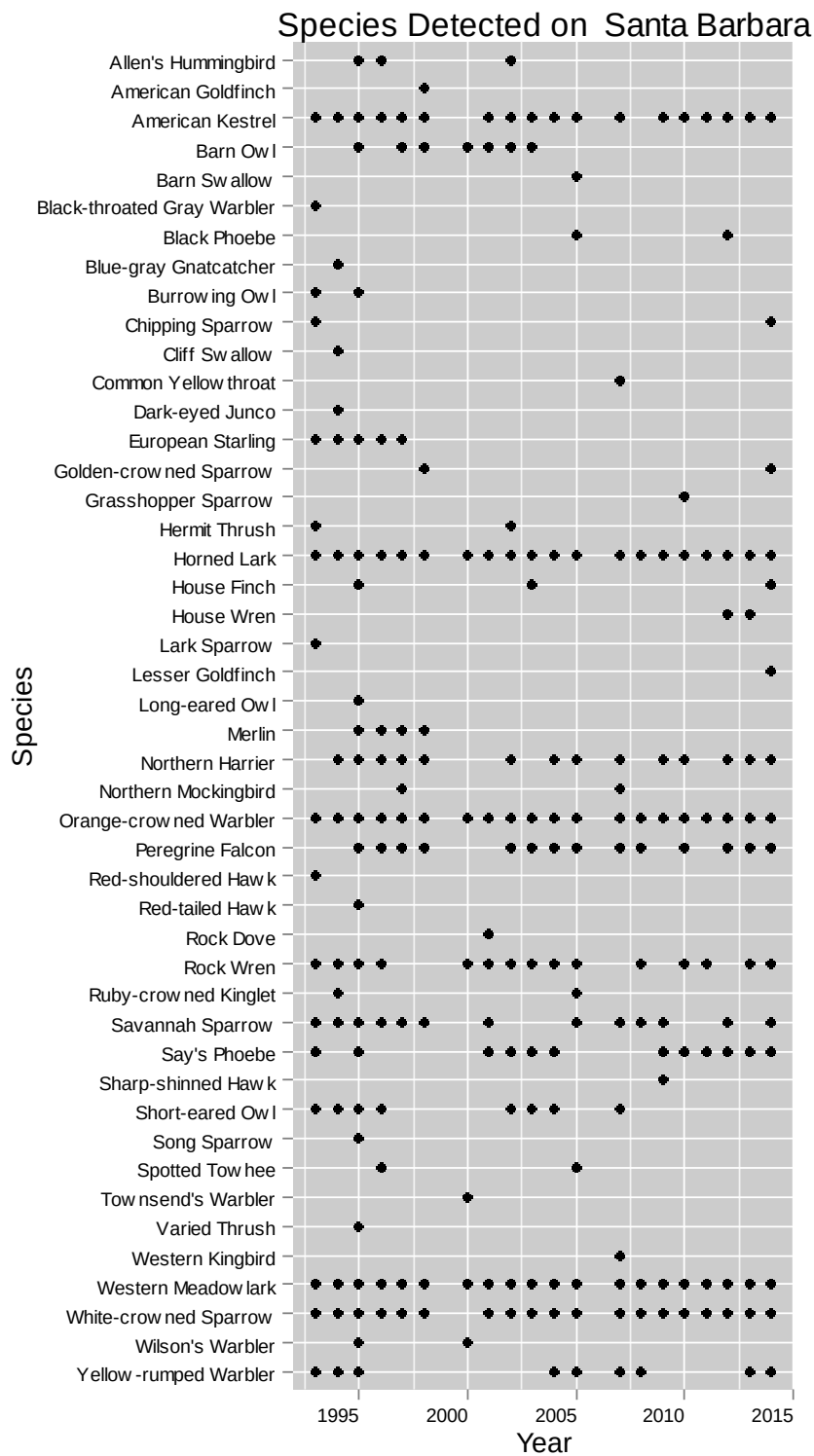


Figure 7. Species occurrence from 1993 – 2014 for Santa Barbara Island. A dot for a particular species and year indicates that the species was detected on either a line transect or point count during that year.

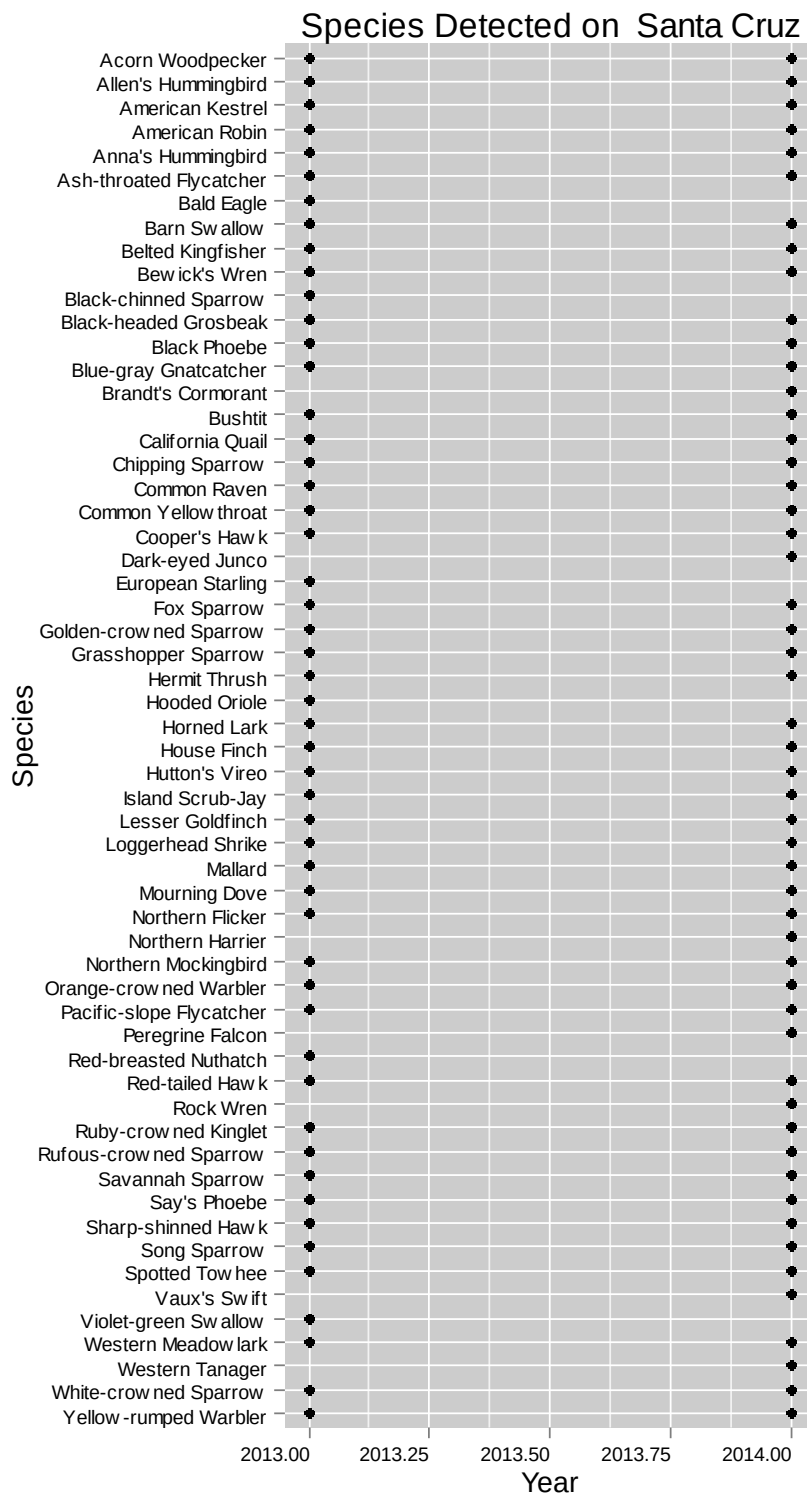


Figure 8. Species occurrence from 1993 – 2014 for Santa Cruz Island. A dot for a particular species and year indicates that the species was detected on either a line transect or point count during that year.

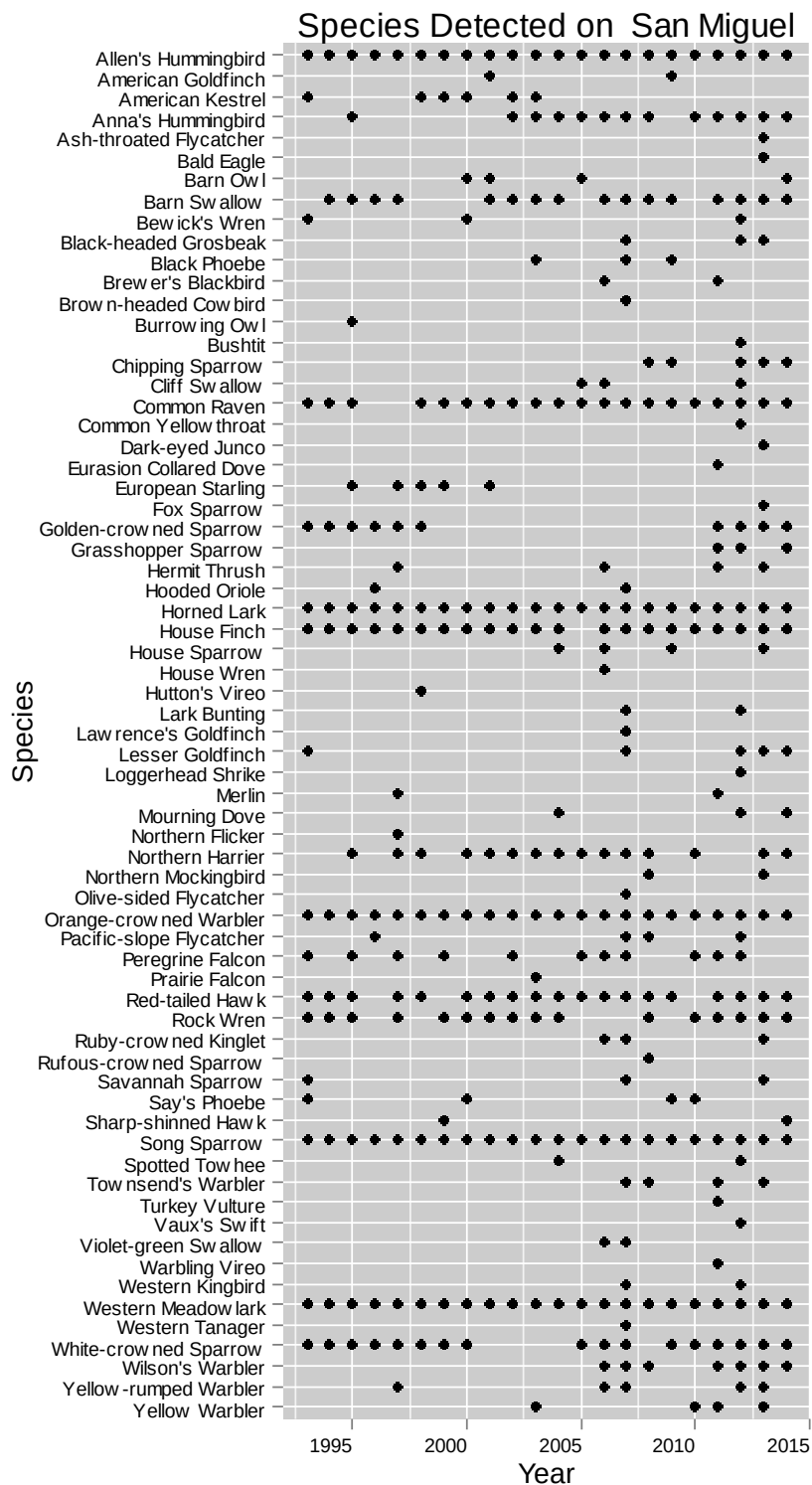


Figure 9. Species occurrence from 1993 – 2014 for San Miguel Island. A dot for a particular species and year indicates that the species was detected on either a line transect or point count during that year.

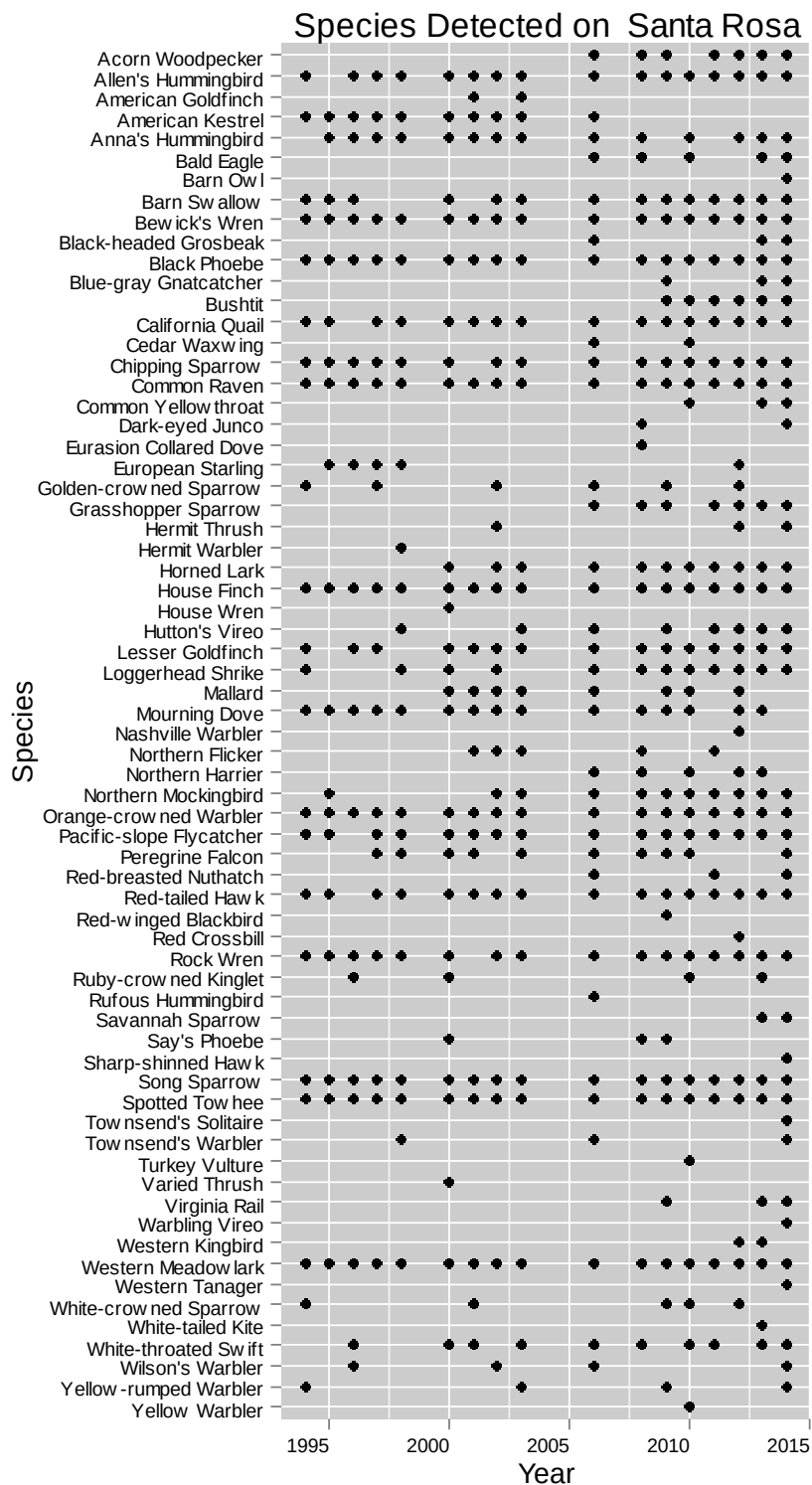


Figure 10. Species occurrence from 1993 – 2014 for Santa Rosa Island. A dot for a particular species and year indicates that the species was detected on either a line transect or point count during that year.

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Appendix A 2014 Landbird Monitoring Site Observers

Anacapa Island

Site	Point Count or Line Transect	Survey Date	Observer
AE01	PC	3/15/2014	Larramendy_Peter
AE02	PC	3/15/2014	Larramendy_Peter
AE03	PC	3/15/2014	Larramendy_Peter
AE04	PC	3/15/2014	Larramendy_Peter
AE05	PC	3/15/2014	Larramendy_Peter
AE06	PC	3/15/2014	Larramendy_Peter
AE07	PC	3/15/2014	Larramendy_Peter
AE08	PC	3/15/2014	Larramendy_Peter
TRLS	LT	3/15/2014	Larramendy_Peter

San Miguel Island

Site	Point Count or Line Transect	Survey Date	Observer
HRRS	LT	4/14/2014	Larramendy_Peter
LKBD	LT	5/29/2014	Larramendy_Peter
NDVR	LT	4/9/2014	Larramendy_Peter
SM01	PC	4/10/2014	Larramendy_Peter
SM02	PC	4/10/2014	Larramendy_Peter
SM03	PC	5/29/2014	Larramendy_Peter
SM04	PC	4/11/2014	Larramendy_Peter
SM05	PC	4/14/2014	Larramendy_Peter
SM06	PC	4/14/2014	Larramendy_Peter
SM07	PC	4/14/2014	Larramendy_Peter
SM08	PC	4/14/2014	Larramendy_Peter
SM09	PC	4/13/2014	Larramendy_Peter
SM10	PC	4/13/2014	Larramendy_Peter
SM11	PC	4/13/2014	Larramendy_Peter
SM12	PC	4/13/2014	Larramendy_Peter
SM13	PC	5/28/2014	Larramendy_Peter
SM14	PC	4/9/2014	Larramendy_Peter
SM15	PC	5/28/2014	Larramendy_Peter
SM16	PC	5/28/2014	Larramendy_Peter
SM17	PC	5/28/2014	Larramendy_Peter
SM18	PC	5/28/2014	Larramendy_Peter
SM19	PC	4/12/2014	Larramendy_Peter
SM20	PC	4/12/2014	Larramendy_Peter
SM21	PC	4/12/2014	Larramendy_Peter
SM22	PC	4/12/2014	Larramendy_Peter
SM23	PC	4/11/2014	Larramendy_Peter
SM24	PC	4/10/2014	Larramendy_Peter
SM25	PC	4/10/2014	Larramendy_Peter
SM26	PC	4/11/2014	Larramendy_Peter
SM27	PC	4/10/2014	Larramendy_Peter
SM28	PC	4/10/2014	Larramendy_Peter
SM29	PC	4/10/2014	Larramendy_Peter
SM30	PC	4/12/2014	Larramendy_Peter
SM31	PC	5/28/2014	Larramendy_Peter
SM32	PC	5/28/2014	Larramendy_Peter
SM33	PC	6/1/2014	Larramendy_Peter
SM34	PC	6/1/2014	Larramendy_Peter
SM35	PC	6/1/2014	Larramendy_Peter
SM36	PC	6/1/2014	Larramendy_Peter

Site	Point Count or Line Transect	Survey Date	Observer
SM37	PC	5/29/2014	Larramendy_Peter
SM38	PC	5/29/2014	Larramendy_Peter
SM39	PC	5/29/2014	Larramendy_Peter
SM40	PC	5/29/2014	Larramendy_Peter
SMHL	LT	5/28/2014	Larramendy_Peter
WLLW	LT	4/11/2014	Larramendy_Peter

Santa Barbara Island

Site	Point Count or Line Transect	Survey Date	Observer
ARCH	LT	3/9/2014	Larramendy_Peter
SB01	PC	3/6/2014	Larramendy_Peter
SB04	PC	3/6/2014	Larramendy_Peter
SB05	PC	3/6/2014	Larramendy_Peter
SB07	PC	3/6/2014	Larramendy_Peter
SB08	PC	3/6/2014	Larramendy_Peter
SB09	PC	3/6/2014	Larramendy_Peter
SB11	PC	3/8/2014	Larramendy_Peter
SB13	PC	3/6/2014	Larramendy_Peter
SB14	PC	3/6/2014	Larramendy_Peter
SB15	PC	3/9/2014	Larramendy_Peter
SB16	PC	3/6/2014	Larramendy_Peter
SB18	PC	3/6/2014	Larramendy_Peter
SB21	PC	3/7/2014	Larramendy_Peter
SB22	PC	3/8/2014	Larramendy_Peter
SB23	PC	3/8/2014	Larramendy_Peter
SB24	PC	3/7/2014	Larramendy_Peter
SB25	PC	3/8/2014	Larramendy_Peter
SB26	PC	3/8/2014	Larramendy_Peter
SB27	PC	3/8/2014	Larramendy_Peter
SB28	PC	3/8/2014	Larramendy_Peter
SB29	PC	3/8/2014	Larramendy_Peter
SB30	PC	3/7/2014	Larramendy_Peter
SB31	PC	3/7/2014	Larramendy_Peter
SB32	PC	3/7/2014	Larramendy_Peter
SB33	PC	3/8/2014	Larramendy_Peter
SGNL	LT	3/9/2014	Larramendy_Peter

Santa Cruz Island

Site	Point Count or Line Transect	Survey Date	Observer
SC001	PC	4/14/2014	Laughrin_Lyndal
SC002	PC	4/14/2014	Laughrin_Lyndal
SC003	PC	4/14/2014	Laughrin_Lyndal
SC004	PC	4/14/2014	Laughrin_Lyndal
SC005	PC	4/14/2014	Laughrin_Lyndal
SC006	PC	4/14/2014	Laughrin_Lyndal
SC007	PC	3/27/2014	Dye_Linda_C
SC008	PC	3/27/2014	Dye_Linda_C
SC009	PC	3/27/2014	Greene_Carolyn
SC010	PC	3/27/2014	Greene_Carolyn
SC011	PC	3/27/2014	Greene_Carolyn
SC012	PC	3/27/2014	Greene_Carolyn
SC013	PC	3/27/2014	Greene_Carolyn
SC014	PC	3/27/2014	Greene_Carolyn
SC015	PC	3/27/2014	Dye_Linda_C
SC016	PC	3/27/2014	Dye_Linda_C
SC019	PC	3/29/2014	Dye_Linda_C
SC020	PC	3/29/2014	Dye_Linda_C
SC021	PC	3/29/2014	Dye_Linda_C
SC022	PC	3/29/2014	Dye_Linda_C
SC023	PC	3/26/2014	Dye_Linda_C
SC024	PC	3/26/2014	Dye_Linda_C
SC025	PC	3/26/2014	Dye_Linda_C
SC026	PC	3/26/2014	Laughrin_Lyndal
SC027	PC	3/27/2014	Laughrin_Lyndal
SC028	PC	3/27/2014	Laughrin_Lyndal
SC029	PC	3/27/2014	Laughrin_Lyndal
SC030	PC	3/27/2014	Larramendy_Peter
SC031	PC	3/27/2014	Laughrin_Lyndal
SC032	PC	3/27/2014	Larramendy_Peter
SC033	PC	3/27/2014	Laughrin_Lyndal
SC034	PC	3/27/2014	Larramendy_Peter
SC035	PC	3/27/2014	Larramendy_Peter
SC036	PC	3/27/2014	Larramendy_Peter
SC037	PC	3/27/2014	Larramendy_Peter
SC038	PC	3/27/2014	Larramendy_Peter
SC039	PC	3/27/2014	Larramendy_Peter
SC040	PC	3/27/2014	Larramendy_Peter
SC041	PC	3/27/2014	Larramendy_Peter
SC042	PC	3/26/2014	Larramendy_Peter
SC043	PC	3/26/2014	Larramendy_Peter
SC044	PC	3/28/2014	Dye_Linda_C
SC045	PC	3/28/2014	Dye_Linda_C
SC046	PC	3/28/2014	Dye_Linda_C
SC047	PC	3/28/2014	Dye_Linda_C
SC048	PC	3/28/2014	Larramendy_Peter
SC049	PC	3/28/2014	Larramendy_Peter
SC050	PC	3/28/2014	Larramendy_Peter
SC051	PC	3/28/2014	Larramendy_Peter
SC052	PC	3/28/2014	Larramendy_Peter
SC053	PC	3/28/2014	Larramendy_Peter
SC054	PC	3/28/2014	Larramendy_Peter
SC055	PC	3/28/2014	Larramendy_Peter
SC056	PC	3/28/2014	Larramendy_Peter
SC057	PC	3/29/2014	Larramendy_Peter
SC058	PC	3/29/2014	Larramendy_Peter
SC059	PC	3/29/2014	Larramendy_Peter

Site	Point Count or Line Transect	Survey Date	Observer
SC060	PC	3/29/2014	Larramendy_Peter
SC061	PC	3/29/2014	Larramendy_Peter
SC062	PC	3/29/2014	Larramendy_Peter
SC063	PC	3/29/2014	Larramendy_Peter
SC064	PC	3/29/2014	Larramendy_Peter
SC065	PC	3/29/2014	Larramendy_Peter
SC066	PC	3/29/2014	Larramendy_Peter
SC067	PC	3/28/2014	Laughrin_Lyndal
SC068	PC	3/28/2014	Laughrin_Lyndal
SC069	PC	3/29/2014	Dye_Linda_C
SC070	PC	3/28/2014	Greene_Carolyn
SC071	PC	4/2/2014	Larramendy_Peter
SC072	PC	3/26/2014	Laughrin_Lyndal
SC073	PC	3/28/2014	Greene_Carolyn
SC074	PC	3/29/2014	Dye_Linda_C
SC075	PC	3/29/2014	Greene_Carolyn
SC076	PC	3/29/2014	Greene_Carolyn
SC077	PC	3/29/2014	Greene_Carolyn
SC078	PC	3/29/2014	Greene_Carolyn
SC079	PC	3/29/2014	Greene_Carolyn
SC080	PC	3/29/2014	Greene_Carolyn
SC081	PC	3/26/2014	Greene_Carolyn
SC082	PC	3/26/2014	Greene_Carolyn
SC083	PC	3/26/2014	Greene_Carolyn
SC084	PC	3/26/2014	Greene_Carolyn
SC085	PC	3/26/2014	Larramendy_Peter
SC086	PC	3/26/2014	Larramendy_Peter
SC087	PC	3/26/2014	Larramendy_Peter
SC088	PC	3/26/2014	Larramendy_Peter
SC089	PC	3/28/2014	Greene_Carolyn
SC090	PC	3/28/2014	Greene_Carolyn
SC091	PC	3/28/2014	Greene_Carolyn
SC092	PC	3/28/2014	Greene_Carolyn
SC093	PC	3/28/2014	Greene_Carolyn
SC094	PC	3/26/2014	Larramendy_Peter
SC095	PC	3/31/2014	Laughrin_Lyndal
SC096	PC	3/28/2014	Laughrin_Lyndal
SC097	PC	3/28/2014	Laughrin_Lyndal
SC098	PC	4/14/2014	Laughrin_Lyndal
SC099	PC	5/10/2014	Laughrin_Lyndal
SC100	PC	5/10/2014	Laughrin_Lyndal
SC109	PC	3/25/2014	Larramendy_Peter
SC110	PC	3/25/2014	Larramendy_Peter
SC111	PC	3/25/2014	Larramendy_Peter
SC112	PC	3/25/2014	Larramendy_Peter
SC113	PC	3/25/2014	Larramendy_Peter
SC114	PC	3/25/2014	Larramendy_Peter
SC115	PC	3/25/2014	Larramendy_Peter
SC116	PC	3/25/2014	Larramendy_Peter
SC117	PC	3/25/2014	Larramendy_Peter
SC118	PC	3/25/2014	Larramendy_Peter
SC119	PC	3/25/2014	Larramendy_Peter
SC120	PC	3/25/2014	Larramendy_Peter
SCP4	PC	3/23/2014	Laughrin_Lyndal
SCP5	PC	3/21/2014	Laughrin_Lyndal
SCP6	PC	3/21/2014	Larramendy_Peter
SCP6	PC	3/23/2014	Laughrin_Lyndal
SCP7	PC	3/21/2014	Laughrin_Lyndal
SCP8	PC	3/21/2014	Laughrin_Lyndal

Santa Rosa Island

Site	Point Count or Line Transect	Survey Date	Observer
SR001	PC	4/27/2014	Dye_Linda_C
SR002	PC	4/27/2014	Dye_Linda_C
SR003	PC	4/27/2014	Dye_Linda_C
SR004	PC	4/29/2014	Harrity_Eamond
SR005	PC	4/29/2014	Harrity_Eamond
SR006	PC	4/29/2014	Harrity_Eamond
SR007	PC	5/23/2014	Dye_Linda_C
SR008	PC	5/23/2014	Dye_Linda_C
SR009	PC	5/23/2014	Dye_Linda_C
SR010	PC	4/27/2014	Harrity_Eamond
SR011	PC	4/27/2014	Dye_Linda_C
SR012	PC	4/27/2014	Dye_Linda_C
SR013	PC	5/12/2014	Larramendy_Peter
SR014	PC	5/12/2014	Larramendy_Peter
SR015	PC	5/12/2014	Larramendy_Peter
SR016	PC	4/25/2014	Dye_Linda_C
SR017	PC	4/25/2014	Dye_Linda_C
SR018	PC	4/25/2014	Dye_Linda_C
SR019	PC	4/24/2014	Dye_Linda_C
SR020	PC	4/24/2014	Dye_Linda_C
SR021	PC	4/24/2014	Dye_Linda_C
SR022	PC	5/12/2014	Larramendy_Peter
SR023	PC	5/12/2014	Larramendy_Peter
SR024	PC	5/12/2014	Larramendy_Peter
SR025	PC	5/22/2014	Sorenson_Graham_H
SR026	PC	5/22/2014	Sorenson_Graham_H
SR027	PC	5/22/2014	Sorenson_Graham_H
SR028	PC	4/23/2014	Dye_Linda_C
SR029	PC	4/23/2014	Gamboa_Maybelline_P
SR030	PC	4/23/2014	Gamboa_Maybelline_P
SR031	PC	4/23/2014	Gamboa_Maybelline_P
SR032	PC	4/23/2014	Gamboa_Maybelline_P
SR033	PC	4/23/2014	Gamboa_Maybelline_P
SR034	PC	5/23/2014	Sorenson_Graham_H
SR035	PC	5/23/2014	Sorenson_Graham_H
SR036	PC	5/23/2014	Sorenson_Graham_H
SR037	PC	5/23/2014	Sorenson_Graham_H
SR038	PC	4/24/2014	Gamboa_Maybelline_P
SR039	PC	4/24/2014	Gamboa_Maybelline_P
SR040	PC	5/22/2014	Hague_Michael_C
SR041	PC	5/22/2014	Hague_Michael_C
SR042	PC	5/22/2014	Hague_Michael_C
SR043	PC	4/24/2014	Harrity_Eamond
SR044	PC	4/24/2014	Harrity_Eamond
SR045	PC	4/24/2014	Harrity_Eamond
SR046	PC	4/29/2014	Harrity_Eamond
SR047	PC	4/29/2014	Harrity_Eamond
SR048	PC	4/29/2014	Harrity_Eamond
SR049	PC	4/24/2014	Dye_Linda_C
SR050	PC	4/24/2014	Dye_Linda_C
SR051	PC	4/24/2014	Dye_Linda_C
SR052	PC	4/25/2014	Gamboa_Maybelline_P
SR053	PC	4/25/2014	Gamboa_Maybelline_P
SR054	PC	4/25/2014	Gamboa_Maybelline_P
SR055	PC	5/8/2014	Larramendy_Peter
SR056	PC	5/8/2014	Larramendy_Peter
SR057	PC	5/8/2014	Larramendy_Peter

Site	Point Count or Line Transect	Survey Date	Observer
SR058	PC	5/8/2014	Larramendy_Peter
SR059	PC	5/8/2014	Larramendy_Peter
SR060	PC	5/8/2014	Larramendy_Peter
SR061	PC	4/25/2014	Gamboa_Maybelline_P
SR062	PC	4/25/2014	Gamboa_Maybelline_P
SR063	PC	4/25/2014	Gamboa_Maybelline_P
SR064	PC	4/25/2014	Harrity_Eamond
SR065	PC	4/25/2014	Harrity_Eamond
SR066	PC	4/25/2014	Harrity_Eamond
SR067	PC	4/25/2014	Harrity_Eamond
SR068	PC	4/25/2014	Dye_Linda_C
SR069	PC	4/25/2014	Harrity_Eamond
SR070	PC	4/25/2014	Dye_Linda_C
SR071	PC	4/25/2014	Harrity_Eamond
SR072	PC	4/25/2014	Dye_Linda_C
SR073	PC	5/11/2014	Larramendy_Peter
SR074	PC	5/11/2014	Larramendy_Peter
SR075	PC	5/11/2014	Larramendy_Peter
SR076	PC	4/24/2014	Gamboa_Maybelline_P
SR077	PC	4/24/2014	Larramendy_Peter
SR078	PC	4/24/2014	Gamboa_Maybelline_P
SR079	PC	4/27/2014	Dye_Linda_C
SR080	PC	4/27/2014	Gamboa_Maybelline_P
SR081	PC	4/27/2014	Gamboa_Maybelline_P
SR082	PC	4/27/2014	Gamboa_Maybelline_P
SR083	PC	4/27/2014	Harrity_Eamond
SR084	PC	4/27/2014	Harrity_Eamond
SR085	PC	4/27/2014	Harrity_Eamond
SR086	PC	4/29/2014	Gamboa_Maybelline_P
SR087	PC	4/29/2014	Gamboa_Maybelline_P
SR088	PC	4/29/2014	Gamboa_Maybelline_P
SR089	PC	5/11/2014	Larramendy_Peter
SR090	PC	5/11/2014	Larramendy_Peter
SR091	PC	4/29/2014	Dye_Linda_C
SR092	PC	5/11/2014	Larramendy_Peter
SR093	PC	5/11/2014	Larramendy_Peter
SR094	PC	5/11/2014	Larramendy_Peter
SR095	PC	5/13/2014	Larramendy_Peter
SR096	PC	5/11/2014	Larramendy_Peter
SR097	PC	5/13/2014	Larramendy_Peter
SR098	PC	5/13/2014	Larramendy_Peter
SR099	PC	5/13/2014	Larramendy_Peter
SR100	PC	5/11/2014	Larramendy_Peter
SR101	PC	5/23/2014	Dye_Linda_C
SR102	PC	5/23/2014	Dye_Linda_C
SR103	PC	5/8/2014	Larramendy_Peter
SR104	PC	4/29/2014	Dye_Linda_C
SR105	PC	4/29/2014	Dye_Linda_C
SR106	PC	5/23/2014	Hague_Michael_C
SR107	PC	5/23/2014	Hague_Michael_C
SR108	PC	5/23/2014	Hague_Michael_C
SR109	PC	5/23/2014	Hague_Michael_C
SR110	PC	5/23/2014	Hague_Michael_C
SR111	PC	5/9/2014	Larramendy_Peter
SR112	PC	5/9/2014	Larramendy_Peter
SR113	PC	5/9/2014	Larramendy_Peter
SR114	PC	5/9/2014	Larramendy_Peter
SR115	PC	5/9/2014	Larramendy_Peter
SR116	PC	4/24/2014	Harrity_Eamond
SR117	PC	4/24/2014	Harrity_Eamond

Site	Point Count or Line Transect	Survey Date	Observer
SR118	PC	4/24/2014	Harrity_Eamond
SR119	PC	4/24/2014	Harrity_Eamond
SR120	PC	4/24/2014	Harrity_Eamond
SR121	PC	5/12/2014	Larramendy_Peter
SR122	PC	5/12/2014	Larramendy_Peter
SR123	PC	5/12/2014	Larramendy_Peter
SR124	PC	5/12/2014	Larramendy_Peter
SR125	PC	5/12/2014	Larramendy_Peter
SR126	PC	4/23/2014	Harrity_Eamond
SR127	PC	4/23/2014	Harrity_Eamond
SR128	PC	4/23/2014	Harrity_Eamond
SR129	PC	4/23/2014	Harrity_Eamond
SR130	PC	4/23/2014	Harrity_Eamond
SR131	PC	4/25/2014	Harrity_Eamond
SR132	PC	4/27/2014	Harrity_Eamond
SR133	PC	4/27/2014	Harrity_Eamond
SR134	PC	4/27/2014	Harrity_Eamond
SR135	PC	4/27/2014	Gamboa_Maybelline_P
SR136	PC	4/27/2014	Gamboa_Maybelline_P
SR137	PC	5/22/2014	Dye_Linda_C
SR138	PC	5/22/2014	Hague_Michael_C
SR139	PC	5/22/2014	Hague_Michael_C
SR140	PC	5/22/2014	Dye_Linda_C
SR141	PC	5/22/2014	Dye_Linda_C
SR142	PC	5/12/2014	Larramendy_Peter
SR143	PC	4/25/2014	Gamboa_Maybelline_P
SR144	PC	4/29/2014	Gamboa_Maybelline_P
SR145	PC	5/11/2014	Larramendy_Peter

The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

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National Park Service
U.S. Department of the Interior



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