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Landbird Monitoring at Channel Islands National Park

2023 Annual Report



Sunrise atop Cherry Canyon overlooking Becher's Bay, Santa Rosa Island, 2023.

NPS / WESTERN FOUNDATION OF VERTEBRATE ZOOLOGY / PETER LARRAMENDY

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Science Report NPS/SR—2026/378

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Abstract

The National Park Service (NPS) has monitored landbirds at Channel Islands National Park (CHIS) since 1993 as part of its long-term inventory and monitoring program. Later, the landbird monitoring program became part of the NPS Inventory and Monitoring Division's Mediterranean Coast Network long-term monitoring programs. In this report, we summarize landbird data collected during the 2023 breeding season and analyze trends since data collection began in 1993 for a select number of species.

Landbird monitoring was conducted between 28 February and 16 May 2023. Using distance-based sampling methods in a standardized protocol, birds were counted at 334 of 335 permanent point count stations (99% of all stations) across CHIS. These surveys were conducted at 29 of 30 points on Santa Barbara Island, 8 of 8 on East Anacapa Islet, 112 of 112 on Santa Cruz Island, 40 of 40 on San Miguel Island, and 145 of 145 on Santa Rosa Island. Counts were not made at one station on Santa Barbara Island due to the presence of nesting California Brown Pelicans. For the first time, repeat visits were made to stations on Santa Barbara Island and East Anacapa Islet in 2023 to improve detection rates. Visits were spaced a month apart and all stations with access (i.e., no nesting seabirds) were counted twice.

In 2023, a total of 53 bird species was counted at point count stations across all five islands, and parkwide, 40 of these species were breeders in CHIS. The ten most highly counted landbirds were, in descending order: Spotted Towhee, Song Sparrow, Horned Lark, Bewick's Wren, White-crowned Sparrow, Orange-crowned Warbler, Western Meadowlark, House Finch, Common Raven, and Island Scrub-Jay. On Santa Rosa Island, Chipping Sparrow continued to show signs of overall decline and European Starlings continued to be detected.

Recommendations for the 2024 landbird monitoring effort in CHIS include (1) changing monitoring on East Anacapa Islet to a spring area search rather than continuing the point counts, (2) conducting only one count timed either before or after seabirds nest on Santa Barbara Island (the best timing should be evaluated in the 2024 season), (3) adding a second count period on Santa Rosa Island to better determine Chipping Sparrow density, and (4) purchasing and deploying starling traps on Santa Rosa Island.

Acknowledgments

Stacey Ostermann-Kelm provided a critical review and Jolie Gareis provided editing and formatting support. In addition to the data collected by author P. Larramendy of the Western Foundation of Vertebrate Zoology (WVZ) Bird Museum and Research Center on Santa Barbara, Santa Cruz, Santa Rosa and San Miguel islands, data also were gathered by Stacy Baker of the National Park Service (NPS; East Anacapa, Santa Cruz, and San Miguel islands), Jim Howard of the California Institute of Environmental Studies (Santa Barbara Island), Lyndal Laughrin (LL) of the University of California (UC) Reserve (Santa Cruz Island), Nick Todd (Santa Cruz and Santa Rosa islands), and Sangeet Khalsa (Santa Cruz and Santa Rosa islands). NPS staff were instrumental in getting observers on, off, and around the islands safely. The UC Reserve on Santa Cruz Island provided lodging and vehicles, and LL assisted with all logistics on this island. Island Packers provided additional transportation on and off island. The WVZ generously provided additional logistical and technical support. Thanks to all!

Introduction

Channel Islands National Park (CHIS) comprises five of the eight Channel Islands that lie off the coast of southern California. The park islands range in size from <300 hectares (East Anacapa and Santa Barbara islands) to >20,000 hectares (Santa Rosa and Santa Cruz islands). Fifty-four terrestrial bird species (hereafter “landbird species”), not including exclusively marine species, have been confirmed as breeding regularly or occasionally on the park islands (Appendix A; Collins and Jones 2015).

The National Park Service (NPS) began monitoring landbirds at CHIS in 1993 as part of its long-term inventory and monitoring program (Davis et al. 1994). The park’s landbird monitoring later became part of the NPS Inventory and Monitoring Division’s Mediterranean Coast Network (MEDN) long-term monitoring programs (Cameron et al. 2005). Data were originally collected on line transects (van Riper et al. 1988) until the program shifted primarily to the point count method starting in 2001 because of a program review in 2000 (Coonan et al. 2011; Fancy 2000). Following the program review, a total of 335 point count stations was sampled across all five islands.

Prior to 2016, monitoring was conducted by experienced CHIS staff, partners, interns, and volunteers. Because of a loss of institutional knowledge due to a reduction in staffing and retirement of key park personnel, the park partnered with the Western Foundation of Vertebrate Zoology (WVZ) to coordinate and conduct the landbird monitoring from 2016 to 2023.

The objectives of the landbird monitoring program (Coonan et al. 2011; van Riper et al. 1988) are as follows:

1. Determine long-term trends in species composition, distribution, and abundance of native and non-native landbird species in selected areas of Channel Islands National Park.
2. Improve our understanding of breeding bird–habitat relationships and the effects of management actions such as non-native plant and animal control on bird populations by correlating changes in landbird species composition, distribution, and abundance with changes in specific habitat variables.

In this report, we summarize data collected during landbird monitoring in 2023. We present simple summaries of raw counts and presence/absence for detected species, as well as historic trends in species abundances for all species counted, and we provide specific recommendations for changes to the program for the 2024 season.

Methods

In 2023, landbird monitoring was conducted on established point count sites called “stations” (Coonan et al. 2011). This was the third monitoring season that the permanent line transects on Santa Barbara, East Anacapa, and San Miguel islands were not surveyed. Based on the 2020 program review (George 2022), it was decided that line transects would no longer be monitored, and eventually, point counts will be established to replace the line transects. A statistical power analysis is currently underway to inform additional modifications to the sampling design.

Distance-based point counts (Buckland et al. 2015) occurred in the morning, beginning as soon as it was light enough to see a distance of at least 150 m and ending no later than four hours after official sunrise. Counts were conducted for 10 minutes at each point count site and were not conducted during high winds (wind strength on the Beaufort scale is sustained at 4 or greater) or heavy rain. Observations were made by sight and sound of either perched or flying birds and included horizontal distances in meters from the observer to the bird.

Overall, a total of 335 permanent point count stations are monitored across the Channel Islands for landbirds: 30 points on Santa Barbara Island (Figure 1), 8 on East Anacapa Islet (Figure 2), 112 on Santa Cruz Island (including 100 sites established by Klinger Figure 3), 40 on San Miguel Island (Figure 4), and 145 on Santa Rosa Island (Figure 5). Prior to the start of the 2023 monitoring season, WFVZ and CHIS decided to remove three stations from monitoring on Santa Barbara Island (17, 19, 20). These stations have been inaccessible for monitoring since 2016 due to nesting California Brown Pelicans (*Pelecanus occidentalis californicus*).

On Santa Cruz Island, we conducted a tenth year of monitoring at 100 non-random point count sites along trails and roads established by R.C. Klinger of The Nature Conservancy in 1991. In addition, we conducted a tenth year of monitoring at 12 non-random point count sites established by NPS in 2013 on the east side of Santa Cruz Island.

The methodology used in 2023 followed Coonan et al. (2011), except for the fog modification that was adopted in 2015 and repeated during the 2016–2023 seasons: the minimum visibility distance necessary to conduct monitoring was reduced from 400 m to 150 m. For a complete description of methods see the *Landbird Monitoring Protocol for Channel Islands National Park – Version 2.0* (Coonan et al. 2011).

One change from all previous years was that two visits were conducted on Santa Barbara Island and East Anacapa Islet for the first time per recommendations from previous technical reports and protocol reviews (George 2022; Larramendy et al. 2023, 2025). We did this to test if an additional count allowed for detection of more species and improved abundance estimates for both islands. Both counts were conducted following the protocol.

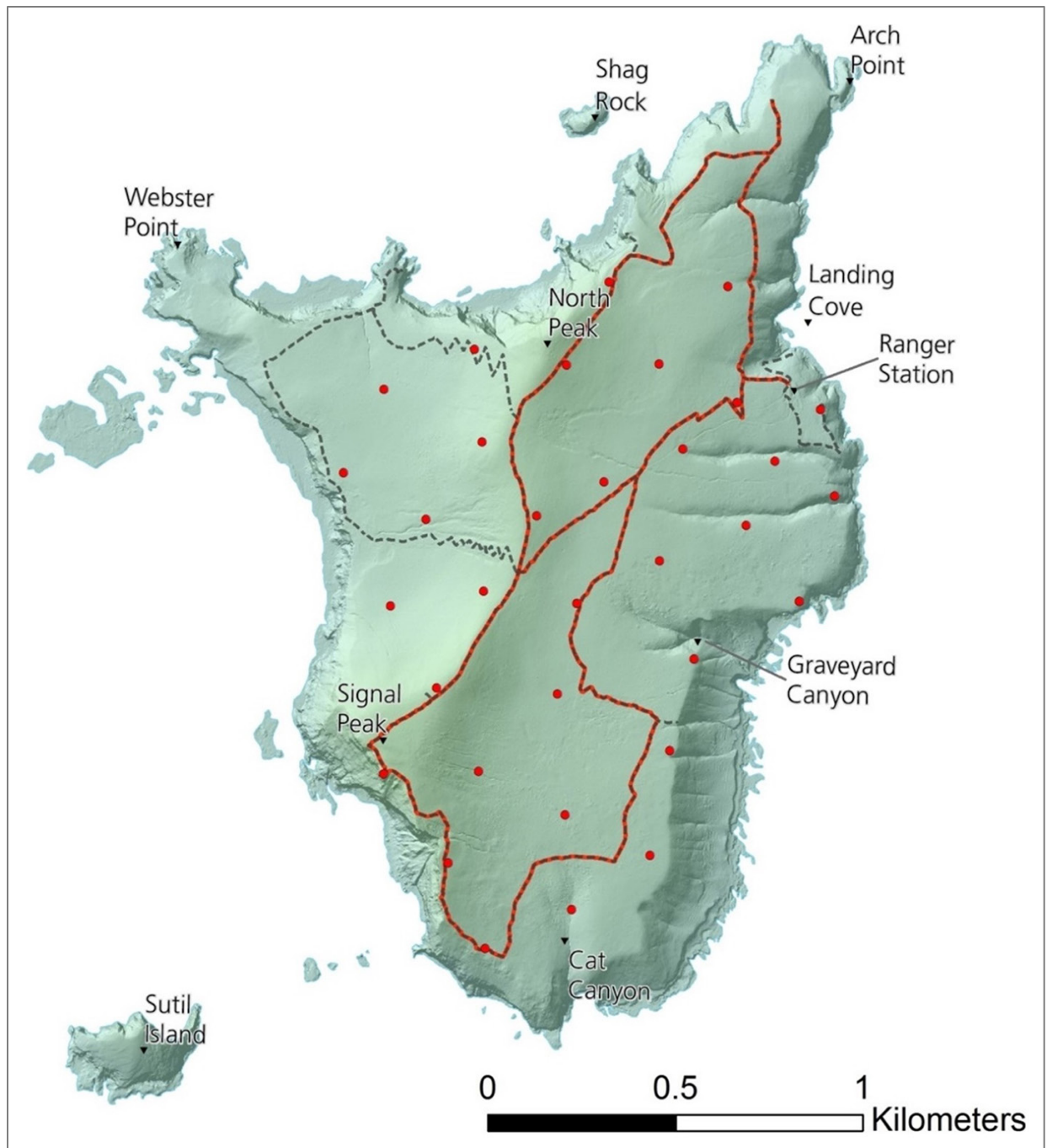


Figure 1. Landbird monitoring point count stations (red dots) and line transects (red lines) on Santa Barbara Island. Line transect surveys were eliminated after 2020.

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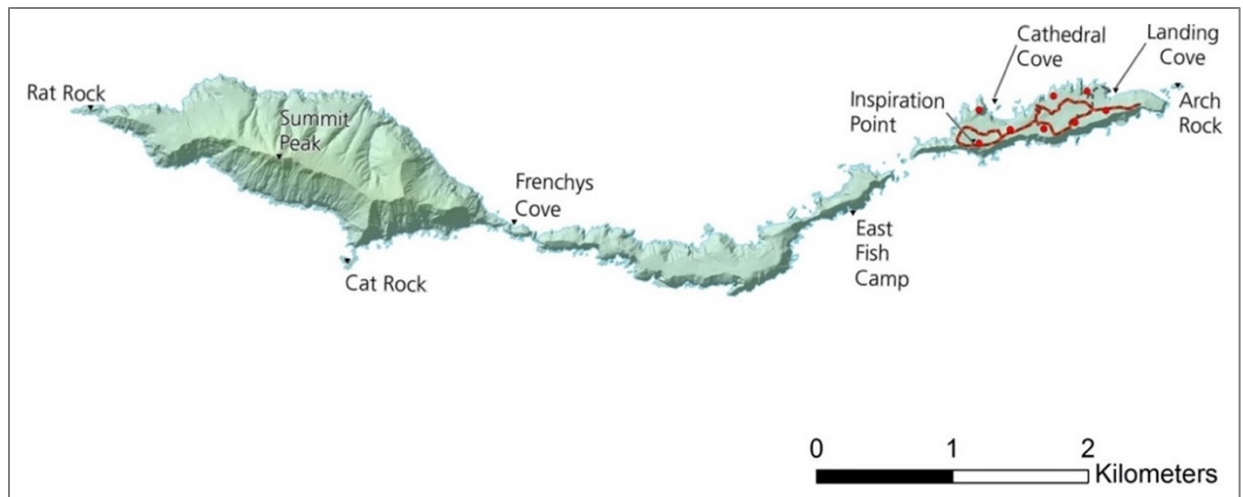


Figure 2. Landbird monitoring point count stations (red dots) and line transects (red lines) on East Anacapa Islet. Line transect surveys were eliminated after 2020.

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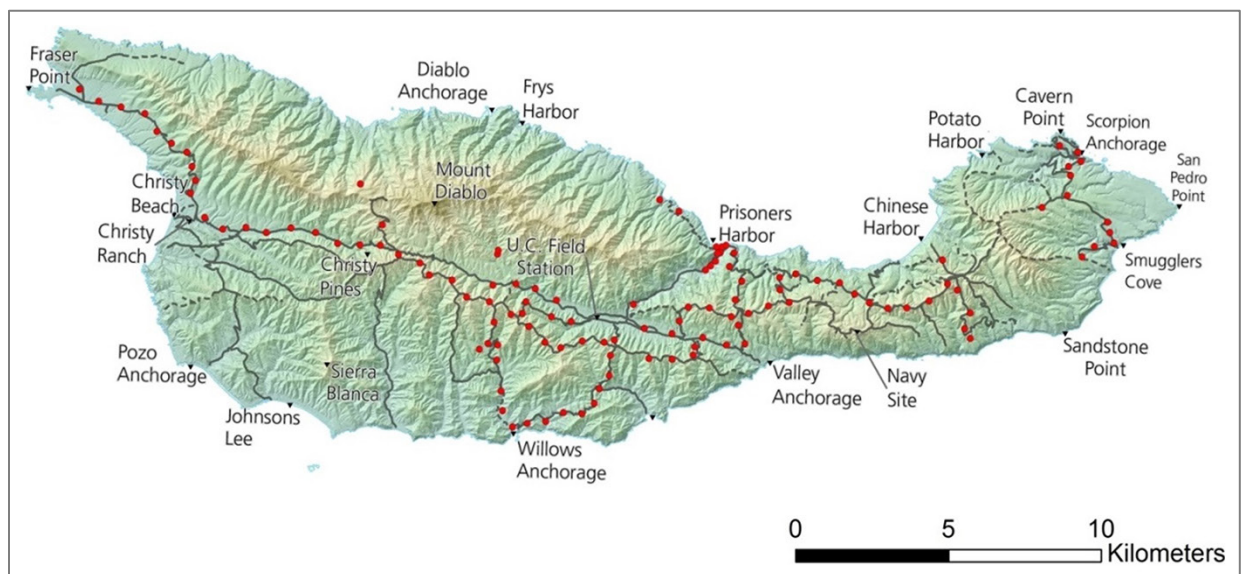


Figure 3. Landbird monitoring point count stations (red dots) on Santa Cruz Island.

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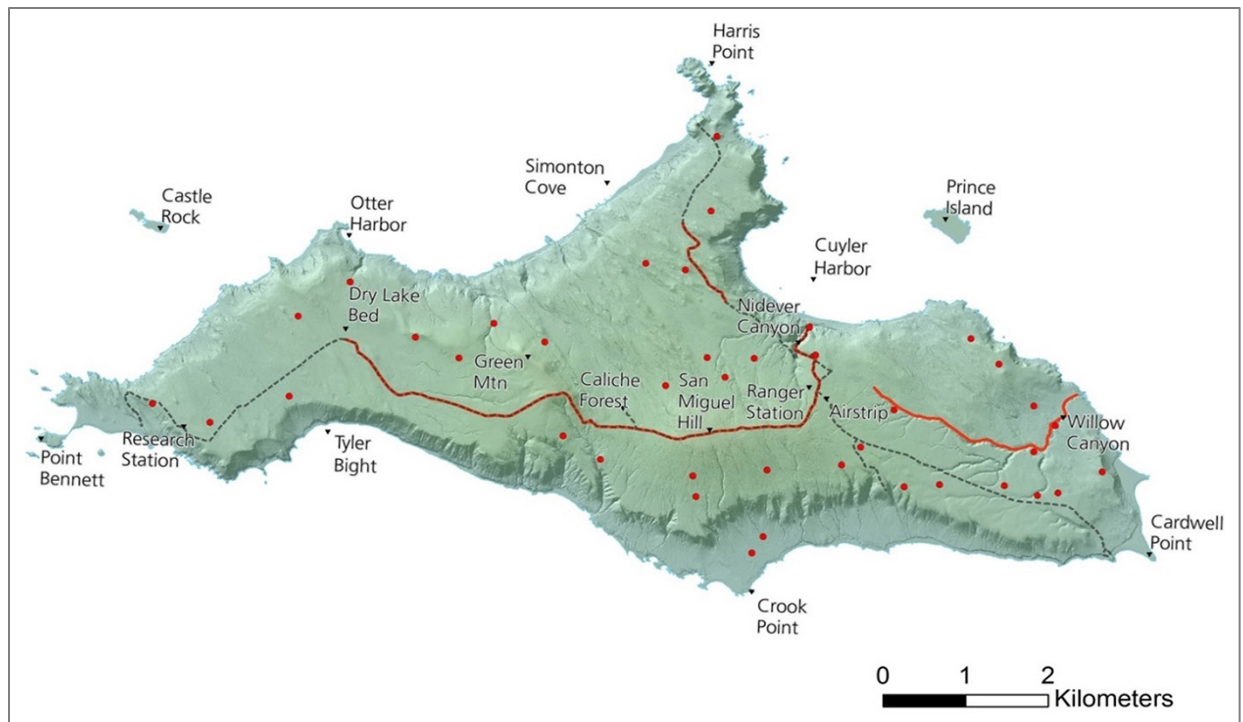


Figure 4. Landbird monitoring point count stations (red dots) and line transects (red lines) on San Miguel Island. Line transect surveys were eliminated after 2020.

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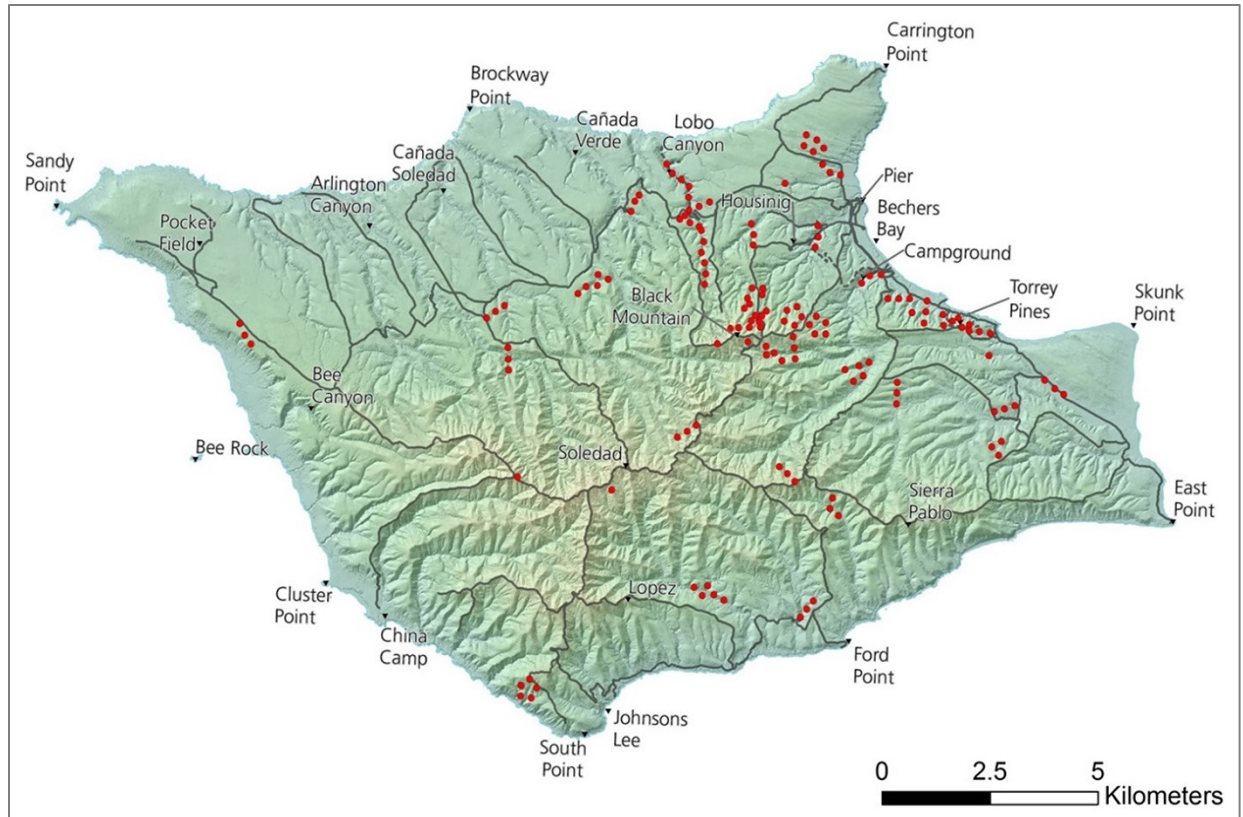


Figure 5. Landbird monitoring point count stations (red dots) on Santa Rosa Island.

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Five observers conducted landbird monitoring in 2023 (available in the report's [supplemental information](#)). Data were entered into the CHIS Landbird Database by P. Larramendy, and then quality-checked and verified for errors by L. Hall. 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.

Data summaries were generated using an automated report run in the program R (R Core Team 2023). We report only the first count data for Santa Barbara Island and East Anacapa Islet within the main body of the report, but we describe the difference between the findings of the two counts and make recommendations for protocol modifications for these two islands in the Discussion.

Results

Monitoring was conducted between 28 February and 27 May 2023 (Table 1). A total of 335 permanent point count stations have been established across the Channel Islands; however, three stations on Santa Barbara Island have been inaccessible for monitoring since 2016 due to nesting California Brown Pelicans. In 2023, 334 station-visits were completed. On Santa Barbara Island, 27 of 30 stations were surveyed on the first visit and 29 of 30 on the second visit. All stations were surveyed on both visits on East Anacapa Islet (8 of 8), and all stations were surveyed on Santa Cruz (112 of 112), San Miguel (40 of 40), and Santa Rosa islands (145 of 145).

Table 1. Survey start and end dates with the number of point count stations monitored in 2023, Channel Islands National Park.

Island	Start Date	End Date	# Point Counts
Santa Barbara	02/28/2023	03/06/2023	27
Santa Barbara	03/26/2023	04/02/2023	29
East Anacapa	03/11/2023	03/12/2023	8
East Anacapa	04/13/2023	04/15/2023	8
San Miguel	04/06/2023	04/11/2023	40
Santa Cruz	04/23/2023	05/27/2023	112
Santa Rosa	05/03/2023	05/16/2023	145

Bird Species Occurrence in 2023

Fifty-three bird species were counted during point counts across all islands in 2023 (Table 2). Forty of these were breeding species on the islands (Table 2, Appendix A). Parkwide, the 10 most detected breeding landbirds in 2023 were, in descending order: Spotted Towhee, Song Sparrow, Horned Lark, Bewick's Wren, White-crowned Sparrow, Orange-crowned Warbler, Western Meadowlark, House Finch, Common Raven, and Island Scrub-Jay (Table 2; scientific names given in Table 2 and Appendix A).

Table 2. Number of individuals of each species counted during bird surveys on all islands in 2023, Channel Islands National Park. Data are from point counts only and do not include birds observed before or after the counts. Note that only the first count totals for Santa Barbara Island and East Anacapa Islet were used in this table to be comparable to counts in prior years.

Common Name	Scientific Name	Total # Detected	East Anacapa	Santa Barbara	Santa Cruz	San Miguel	Santa Rosa
Acorn Woodpecker ^A	<i>Melanerpes formicivorus</i>	61	–	–	16	–	45
Allen's Hummingbird ^A	<i>Selasphorus sasin</i>	54	–	–	1	7	46
American Robin ^A	<i>Turdus migratorius</i>	4	–	–	3	–	1
Anna's Hummingbird ^A	<i>Calypte anna</i>	62	–	–	22	3	38
Ash-throated Flycatcher ^A	<i>Myiarchus cinerascens</i>	50	–	–	50	–	–
Bald Eagle ^A	<i>Haliaeetus leucocephalus</i>	4	–	–	2	–	2
Barn Swallow ^A	<i>Hirundo rustica</i>	29	–	–	14	–	15
Bewick's Wren ^A	<i>Thryomanes bewickii</i>	390	–	–	136	4	251
Black-headed Grosbeak ^A	<i>Pheucticus melanocephalus</i>	14	–	–	12	–	2
Black Phoebe ^A	<i>Sayornis nigricans</i>	2	–	–	–	–	2
Blue-gray Gnatcatcher ^A	<i>Polioptila caerulea</i>	6	–	–	6	–	–
Bushtit ^A	<i>Psaltiriparus minimus</i>	20	–	–	12	–	8
California Quail ^A	<i>Callipepla californica</i>	116	–	–	69	–	47
Canyon Wren ^A	<i>Catherpes mexicanus</i>	2	–	–	2	–	–
Cedar Waxwing	<i>Bombycilla cedrorum</i>	2	–	–	–	–	2
Chipping Sparrow ^A	<i>Spizella passerina</i>	114	–	–	37	–	78
Common Raven ^A	<i>Corvus corax</i>	151	4	–	29	31	87
Common Yellowthroat	<i>Geothlypis trichas</i>	2	–	–	1	–	1
Cooper's Hawk ^A	<i>Accipiter cooperii</i>	1	–	–	1	–	–
Dark-eyed Junco ^A	<i>Junco hyemalis</i>	3	–	–	2	–	1
European Starling ^A	<i>Sturnus vulgaris</i>	11	–	–	–	–	11
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	3	–	–	3	–	–
Grasshopper Sparrow ^A	<i>Ammodramus savannarum</i>	7	–	–	7	–	–

^A Resident breeding landbirds on at least one of the five islands in Channel Islands National Park. Data on nesting status from Collins and Jones (2015).

Table 2 (continued). Number of individuals of each species counted during bird surveys on all islands in 2023, Channel Islands National Park. Data are from point counts only and do not include birds observed before or after the counts. Note that only the first count totals for Santa Barbara Island and East Anacapa Islet were used in this table to be comparable to counts in prior years.

Common Name	Scientific Name	Total # Detected	East Anacapa	Santa Barbara	Santa Cruz	San Miguel	Santa Rosa
Hermit Thrush	<i>Catharus guttatus</i>	5	–	–	–	5	–
Horned Lark ^A	<i>Eremophila alpestris</i>	254	–	169	11	51	23
House Finch ^A	<i>Carpodacus mexicanus</i>	243	–	3	65	21	154
Hutton's Vireo ^A	<i>Vireo huttoni</i>	17	–	–	14	–	3
Island Scrub-Jay ^A	<i>Aphelocoma insularis</i>	122	–	–	122	–	–
Lazuli Bunting	<i>Passerina amoena</i>	12	–	–	8	–	4
Lesser Goldfinch ^A	<i>Carduelis psaltria</i>	55	–	–	5	1	49
Loggerhead Shrike ^A	<i>Lanius ludovicianus</i>	13	–	–	7	–	6
Mourning Dove ^A	<i>Zenaida macroura</i>	21	–	–	8	–	13
Northern Flicker ^A	<i>Colaptes auratus</i>	17	–	–	17	–	–
Northern Harrier ^A	<i>Circus cyaneus</i>	2	–	1	–	1	–
Northern Mockingbird ^A	<i>Mimus polyglottos</i>	37	–	–	8	–	29
Orange-crowned Warbler ^A	<i>Leiothlypis celata</i>	368	–	1	93	90	184
Pacific-slope Flycatcher ^A	<i>Empidonax difficilis</i>	114	–	–	10	–	104
Peregrine Falcon ^A	<i>Falco peregrinus</i>	11	2	3	–	2	4
Red-tailed Hawk ^A	<i>Buteo jamaicensis</i>	5	–	–	3	–	2
Rock Wren ^A	<i>Salpinctes obsoletus</i>	9	–	1	–	6	2
Ruby-crowned Kinglet	<i>Regulus calendula</i>	1	–	–	–	1	–
Rufous-crowned Sparrow ^A	<i>Aimophila ruficeps</i>	40	–	–	40	–	–
Savannah Sparrow	<i>Passerculus sandwichensis</i>	23	–	22	1	–	–
Say's Phoebe	<i>Sayornis saya</i>	5	1	4	–	–	–
Song Sparrow ^A	<i>Melospiza melodia</i>	521	6	–	105	124	286
Spotted Towhee ^A	<i>Pipilo maculatus</i>	744	–	–	305	–	443

^A Resident breeding landbirds on at least one of the five islands in Channel Islands National Park. Data on nesting status from Collins and Jones (2015).

Table 2 (continued). Number of individuals of each species counted during bird surveys on all islands in 2023, Channel Islands National Park. Data are from point counts only and do not include birds observed before or after the counts. Note that only the first count totals for Santa Barbara Island and East Anacapa Islet were used in this table to be comparable to counts in prior years.

Common Name	Scientific Name	Total # Detected	East Anacapa	Santa Barbara	Santa Cruz	San Miguel	Santa Rosa
Townsend's Warbler	<i>Dendroica townsendi</i>	2	–	–	–	–	2
Western Meadowlark ^A	<i>Sturnella neglecta</i>	317	–	29	26	85	177
Western Tanager	<i>Piranga ludoviciana</i>	1	–	–	1	–	–
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	196	32	124	2	38	–
White-throated Swift ^A	<i>Aeronautes saxatalis</i>	7	–	–	7	–	–
Wilson's Warbler	<i>Wilsonia pusilla</i>	3	–	–	2	–	1
Yellow-rumped Warbler	<i>Dendroica coronata</i>	8	–	–	3	5	–
Total Number of Species per Island (Richness)	N/A	53	5	10	43	17	35

^A Resident breeding landbirds on at least one of the five islands in Channel Islands National Park. Data on nesting status from Collins and Jones (2015).

Bird Species Occurrence in 2023 Compared to All Years of Monitoring

No breeding species detected on East Anacapa Islet had decreasing numbers in 2023 (Figure 6). Based on 2023 counts falling below the first quartile range of counts for all years, the following species decreased in number in 2023:

- Western Meadowlark on Santa Barbara Island (Figure 7),
- Acorn Woodpecker, Allen's Hummingbird, Common Raven, Hutton's Vireo, and Northern Flicker on Santa Cruz Island (Figure 8),
- Common Raven and Song Sparrow on San Miguel Island (Figure 9), and
- Chipping Sparrow on Santa Rosa Island (Figure 10).

Breeding bird species with increased detections (counts above the third quartile range of counts for all years) in 2023 were:

- Common Raven on East Anacapa Islet (Figure 6),
- Horned Lark on Santa Barbara Island (Figure 7),
- Ash-throated Flycatcher, California Quail, Horned Lark, Lazuli Bunting, and White-throated Swift on Santa Cruz Island (Figure 8),
- Bewick's Wren and Rock Wren on San Miguel (Figure 9), and
- Acorn Woodpecker, Bewick's Wren, California Quail, Northern Mockingbird, and Spotted Towhee on Santa Rosa Island (Figure 10).

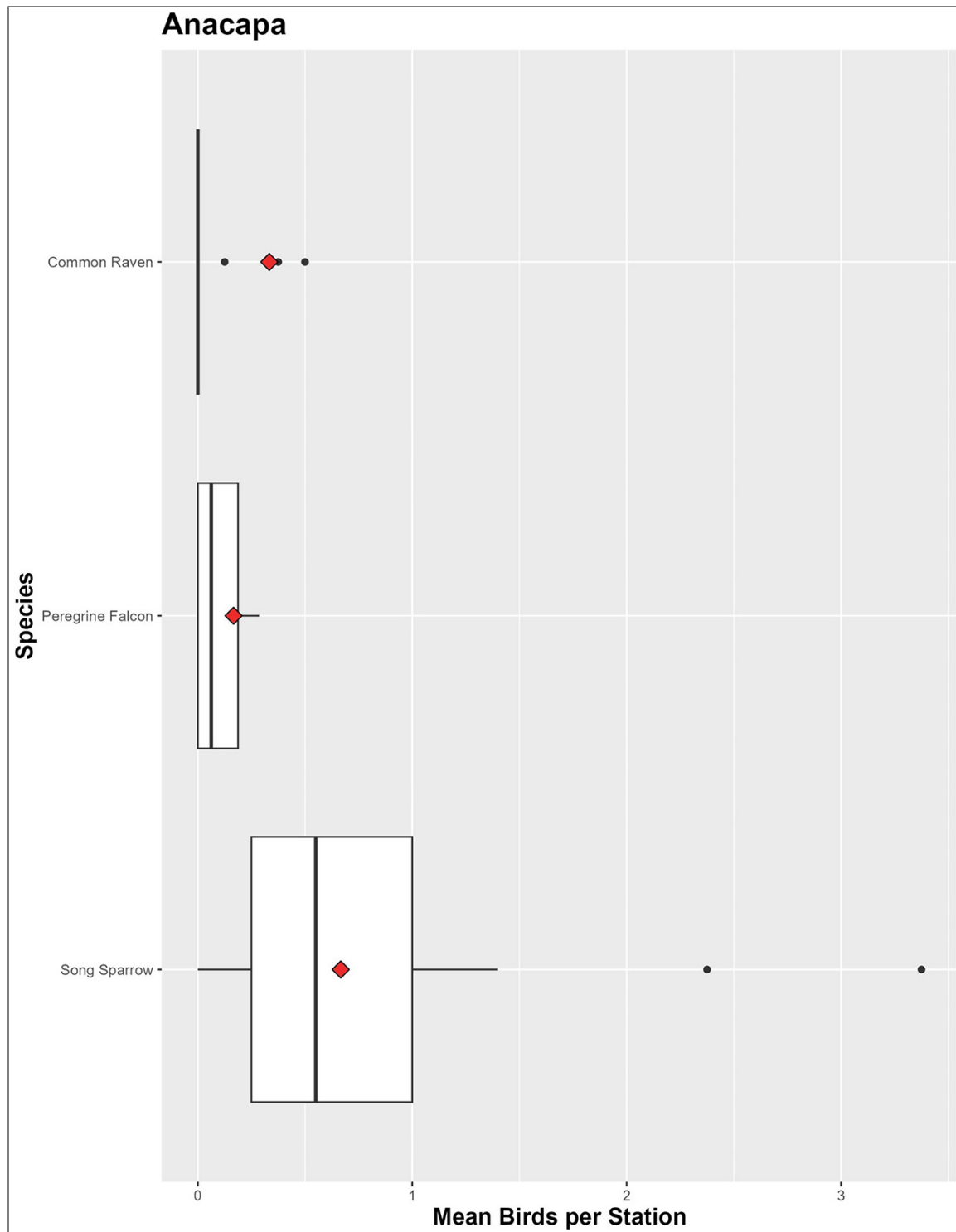


Figure 6. Boxplots for each breeding bird species detected at point count stations on East Anacapa Islet (including only the first count in 2023). Boxplots display the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum over the entire monitoring period (2001–2023). Red diamonds represent the mean value for 2023 across all point count stations.

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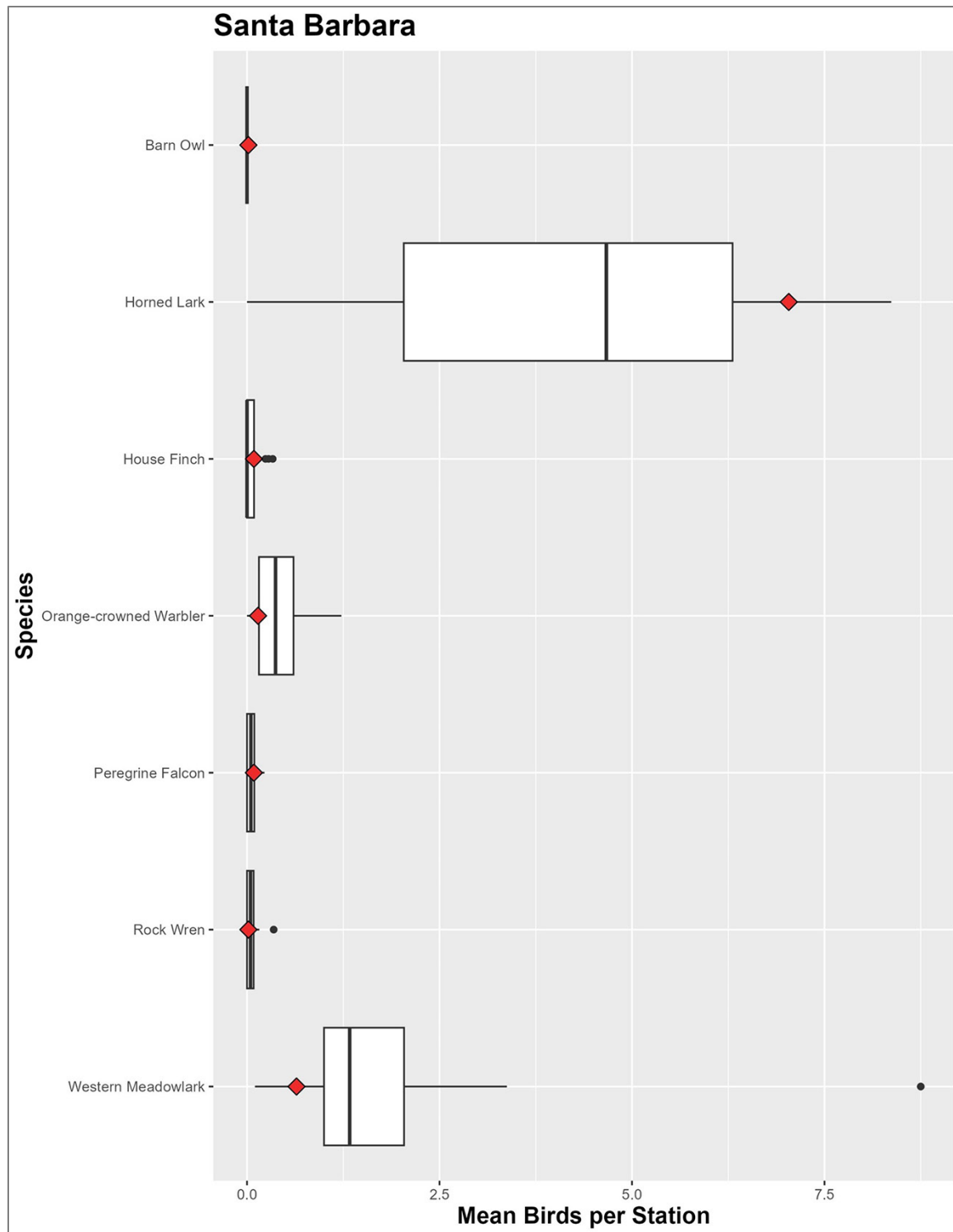


Figure 7. Boxplots for each breeding bird species detected at point count stations on Santa Barbara Island (including only the first count in 2023). Boxplots display the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum over the entire monitoring period (1995–2023). Red diamonds represent the mean value for 2023 across all point count stations.

NPS

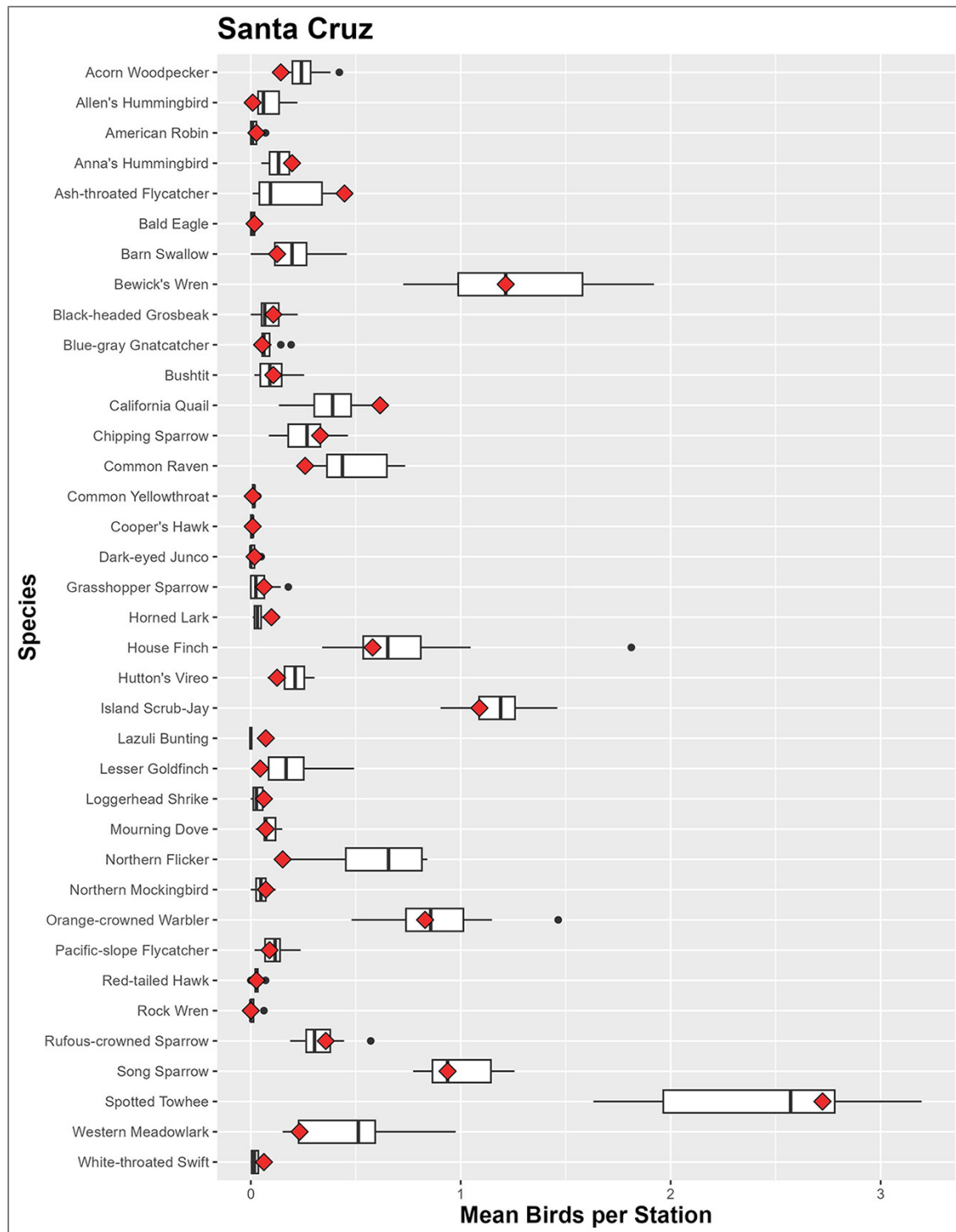


Figure 8. Boxplots for each breeding bird species detected at point count stations on Santa Cruz Island. Boxplots display the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and over the entire monitoring period (2013–2023). Red diamonds represent the mean value for 2023 across all point count stations.

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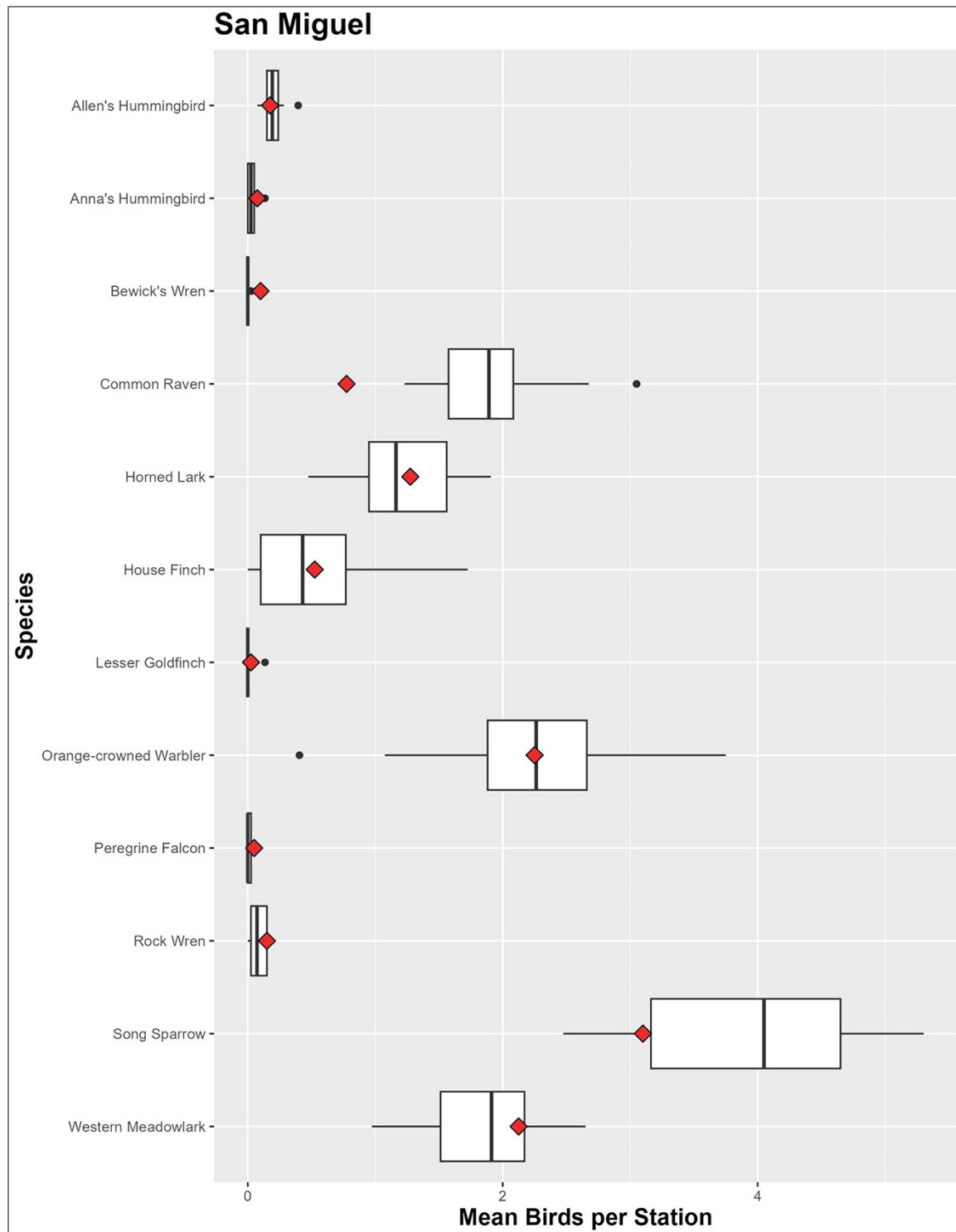


Figure 9. Boxplots for each breeding bird species detected at point count stations on San Miguel Island. Boxplots display the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum over the entire monitoring period (2002–2023). Red diamonds represent the mean value for 2023 across all point count stations.

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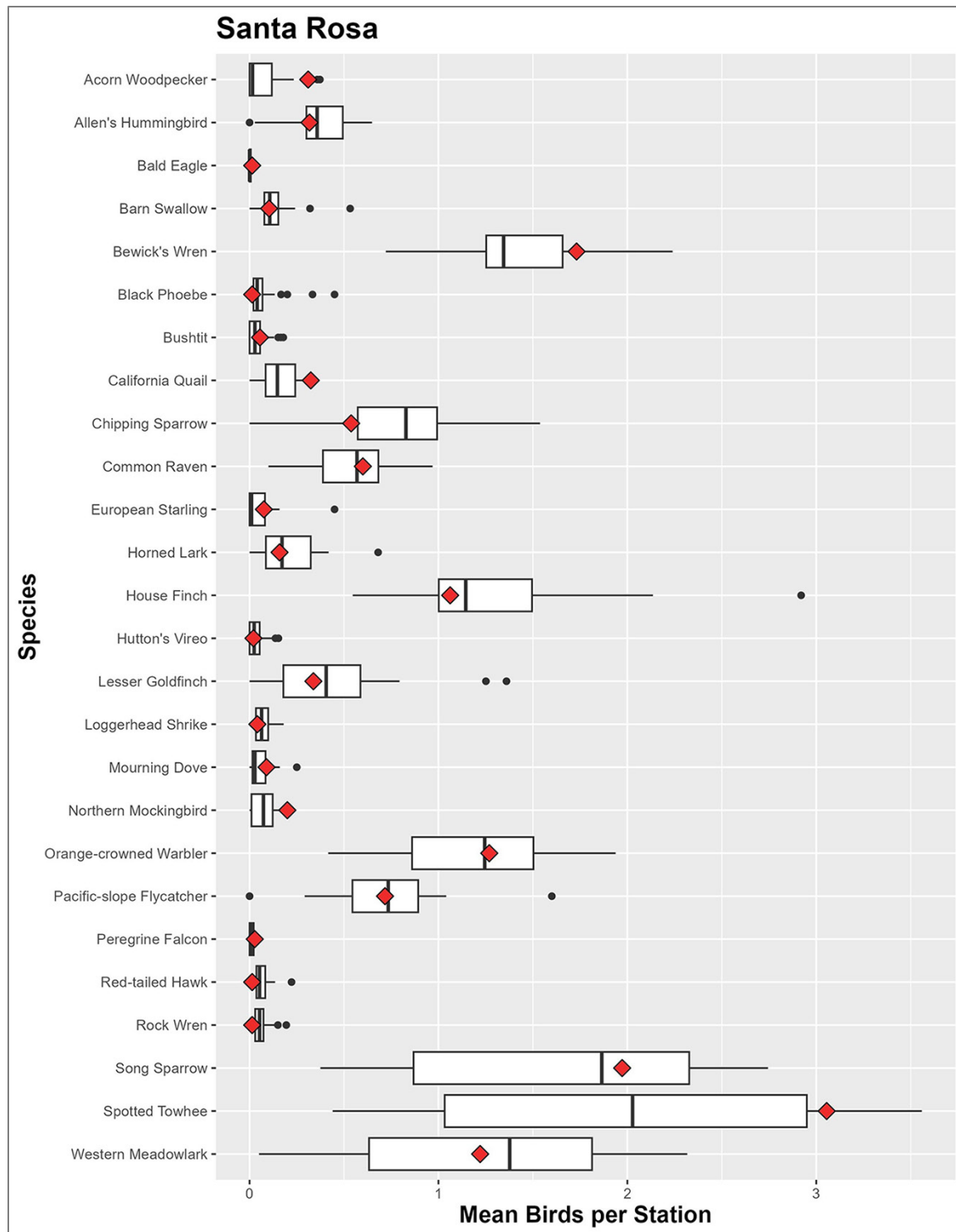


Figure 10. Boxplots for each breeding bird species detected at point count stations on Santa Rosa Island. Boxplots display the distribution of data based on the five number summary: minimum, first quartile, median, third quartile, and maximum over the entire monitoring period (1994–2023). Red diamonds represent the mean value for 2023 across all point count stations.

NPS

Patterns in Bird Species Occurrence over Time

East Anacapa Islet

Since 1993, 26 landbird species have been counted on East Anacapa Islet (Figure 11). In 2023, five species were counted during the first monitoring visit to East Anacapa (Table 2) and a total of six species were counted during both monitoring visits (Figure 11; a breakdown of species abundances per monitoring visit is found in Appendix B). In 2023, Common Raven numbers for the third year in a row were above the third quartile (i.e., >75%) of their abundance average (Figure 6). A common species on the island, Orange-crowned Warbler, has not been counted for six consecutive years, including the 2023 monitoring season (Figure 11). One Orange-crowned Warbler was seen outside of survey time. No new transient species were detected in 2023; six transient or visiting species (defined as native species that have been recorded only once or twice during point counts or transects on an island, do not breed on the islands, and occur either as transients or winter/spring visitors) have been counted on the island overall since 1993 (Table 3).

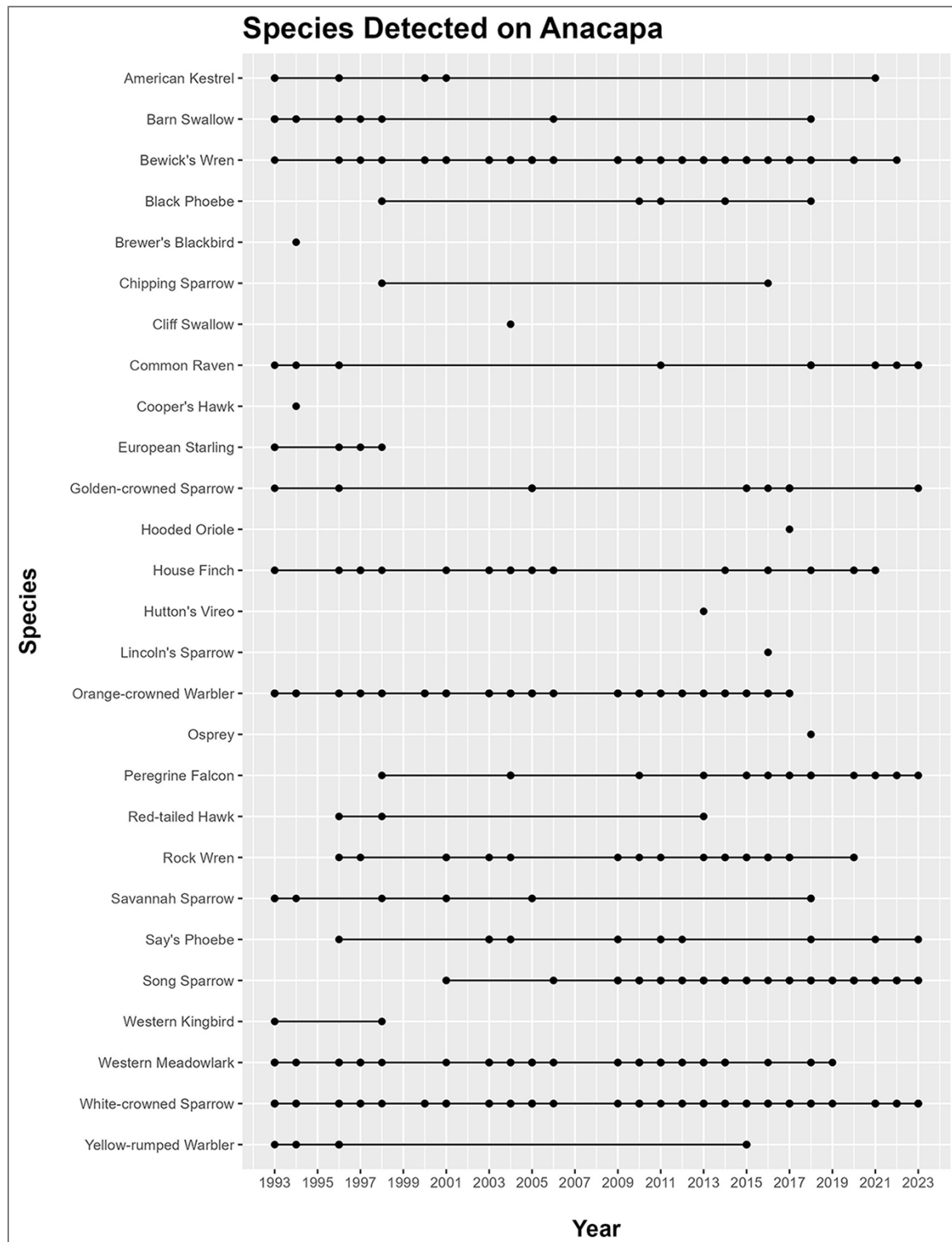


Figure 11. Species occurrence from 1993–2023 for East Anacapa Islet. Data for 2023 includes species detected during both monitoring visits to East Anacapa. A dot indicates that a species was detected at a point count or line transect (prior to 2020) during that year.

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Table 3. Transient and visiting species counted in all years since monitoring began (“X”), on each of the five northern Channel Islands. “Transient or visiting” species are defined here as native species that have been recorded only once or twice during point counts or line transects and do not breed on the islands. No new transient or visiting species were observed in 2023.

Species	East Anacapa Islet	Santa Barbara Island	Santa Cruz Island	San Miguel Island	Santa Rosa Island
American Goldfinch	–	X	X	X	–
American Robin	–	–	–	–	X
Ash-throated Flycatcher	–	–	–	X	–
Bald Eagle	–	–	–	X	–
Barn Owl	–	–	–	–	X
Barn Swallow	–	X	–	–	–
Bewick’s Wren	–	X	–	–	–
Black-chinned Sparrow	–	–	X	–	–
Black-throated Gray Warbler	–	–	–	–	X
Blue-gray Gnatcatcher	–	X	–	–	–
Brewer’s Blackbird	–	–	X	X	–
Bullock’s Oriole	–	–	X	–	–
Burrowing Owl	–	–	–	X	–
Bushtit	–	–	–	X	–
Cedar Waxwing	–	–	–	–	X
Cliff Swallow	X	X	–	–	–
Common Raven	–	X	–	–	–
Common Yellowthroat	–	X	–	X	–
Cooper’s Hawk	–	–	X	–	X
Dark-eyed (Oregon) Junco	–	X	X	X	–
Fox Sparrow	–	–	–	X	–
Grasshopper Sparrow	–	X	–	–	–
Hermit Warbler	–	–	X	–	X
Hooded Oriole	X	–	–	X	–
House Wren	–	–	X	X	–
Hutton’s Vireo	X	–	–	X	–
Lark Sparrow	–	X	–	–	–
Lawrence’s Goldfinch	–	–	X	X	X
Lazuli Bunting	–	–	X	X	–
Lesser Goldfinch	–	X	–	–	–
Lincolns Sparrow	–	X	–	–	–
Loggerhead Shrike	–	–	–	X	–

Table 3 (continued). Transient and visiting species counted in all years since monitoring began (“X”), on each of the five northern Channel Islands. “Transient or visiting” species are defined here as native species that have been recorded only once or twice during point counts or line transects and do not breed on the islands. No new transient or visiting species were observed in 2023.

Species	East Anacapa Islet	Santa Barbara Island	Santa Cruz Island	San Miguel Island	Santa Rosa Island
Long-eared Owl	–	X	–	–	–
Merlin	–	–	–	X	–
Nashville Warbler	–	–	–	X	X
Northern Flicker	–	–	–	X	–
Northern Mockingbird	–	X	–	X	–
Olive-sided Flycatcher	–	–	–	X	–
Osprey	X	–	X	–	–
Prairie Falcon	–	–	X	X	–
Red-breasted Sapsucker	–	–	X	–	–
Red-shouldered Hawk	–	X	–	–	–
Red-winged Blackbird	–	–	–	–	X
Rose-breasted Grosbeak	–	–	–	–	X
Ruby-crowned Kinglet	–	X	–	–	–
Rufous Hummingbird	–	–	–	X	X
Rufous-crowned Sparrow	–	–	–	X	–
Sharp-shinned Hawk	–	X	–	X	X
Short-eared Owl	–	–	–	X	–
Song Sparrow	–	X	–	–	–
Spotted Towhee	–	–	–	X	–
Swainson’s Thrush	–	–	–	–	X
Townsend’s Solitaire	–	–	–	–	X
Townsend’s Warbler	–	–	X	–	–
Turkey Vulture	–	–	–	X	X
Varied Thrush	–	X	X	–	X
Vaux’s Swift	–	–	–	X	–
Vesper Sparrow	–	X	–	–	–
Warbling Vireo	–	X	X	X	X
Western Kingbird	X	X	X	X	X
Western Tanager	–	–	X	X	X
White-tailed Kite	–	–	–	–	X
Wilson’s Warbler	–	X	X	–	–

Table 3 (continued). Transient and visiting species counted in all years since monitoring began (“X”), on each of the five northern Channel Islands. “Transient or visiting” species are defined here as native species that have been recorded only once or twice during point counts or line transects and do not breed on the islands. No new transient or visiting species were observed in 2023.

Species	East Anacapa Islet	Santa Barbara Island	Santa Cruz Island	San Miguel Island	Santa Rosa Island
Yellow-rumped Warbler (Audubon’s)	X	–	–	–	–
Yellow Warbler	–	–	X	–	X
No. of transient/visiting species on each island	6	23	21	32	21
No. of new transient/visiting species in 2023	0	0	0	0	0

Santa Barbara Island

Since 1993, 50 landbird species have been counted on Santa Barbara Island (Figure 12). In 2023, 10 species were counted during the first monitoring visit to Santa Barbara (Table 2) and a total of 13 species were counted during both monitoring visits (Figure 12; a breakdown of species abundances per monitoring visit is found in Appendix B). For a fifth consecutive year, in 2023 Western Meadowlarks were observed below the first quartile (i.e., <25%) of their historic abundance (Figure 7). No new transient species were counted in 2023 on Santa Barbara; 23 transient or visiting species have been counted on the island since 1993 (Table 3).

Santa Cruz Island

Since 2013, 78 landbird species have been counted on Santa Cruz Island (Figure 13). A total of 43 species were counted in 2023 (Table 2). This is the first year in over five years that Western Meadowlarks were counted above the first quartile of their abundance average on Santa Cruz (Figure 8). Common Raven for a third consecutive year was counted below the first quartile of their historic abundance, while Northern Flicker for a second consecutive year was counted below the first quartile of their historic abundance on Santa Cruz (Figure 8). Grasshopper Sparrow was counted for the first time since 2019 (Figure 13). No new transient species were counted in 2023 on Santa Cruz; 21 transient or visiting species have been counted on this island since 2013 (Table 3).

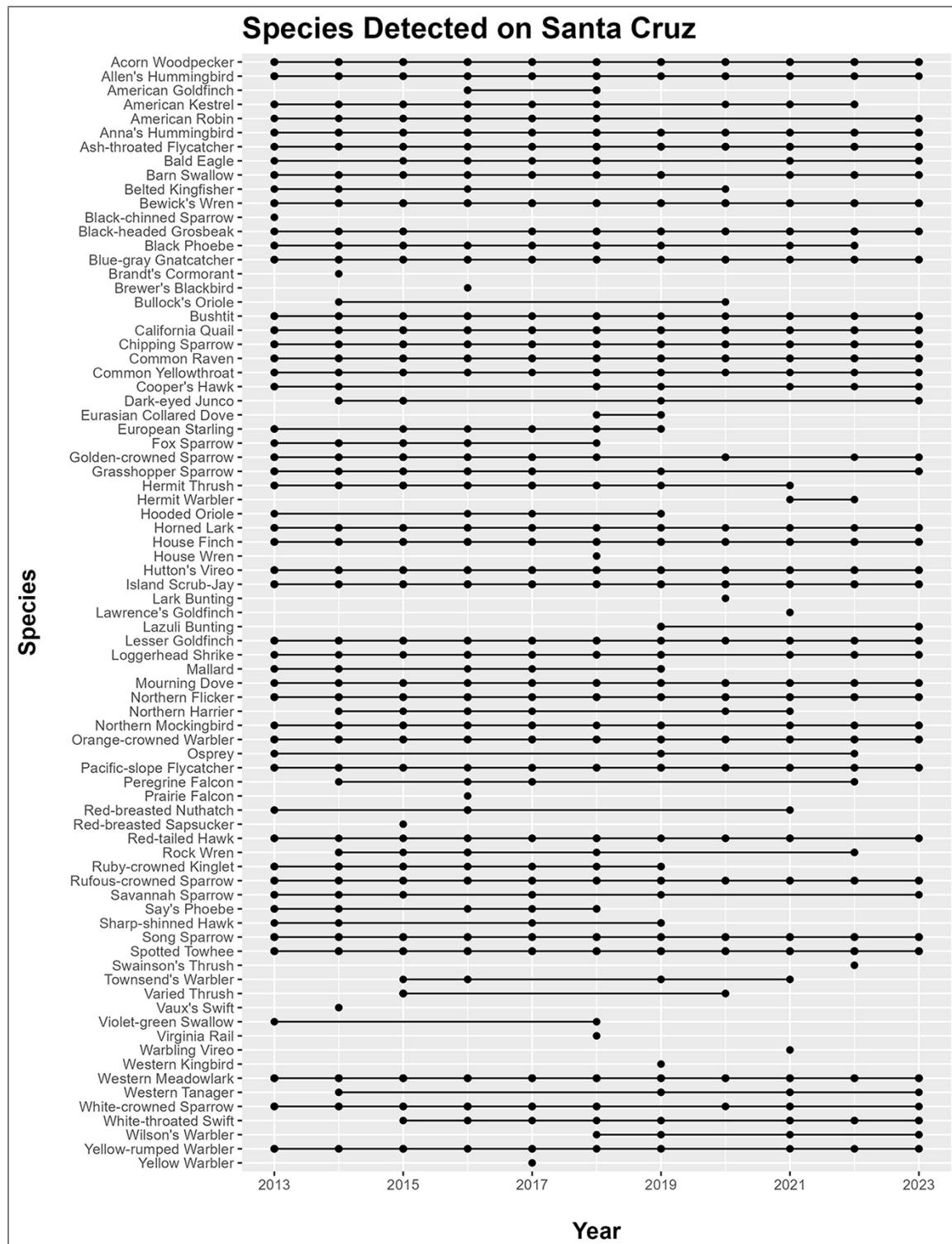


Figure 13. Species occurrence from 2013–2023 for Santa Cruz Island. A dot indicates that a species was detected at a point count or line transect (prior to 2020) during that year.

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San Miguel Island

Since 1993, 70 landbird species have been counted San Miguel Island (Figure 14); 17 were counted in 2023 (Table 2). Barn Swallow has not been detected for five consecutive years on San Miguel (Figure 14). Bewick's Wren was counted for a third consecutive year above the third quartile of its historic abundance (Figure 9). Lesser Goldfinch was counted for the first time since 2014 (Figure 14). No transient species were counted in 2023; 32 transient or visiting species have been counted on the island since 1993 (Table 3).

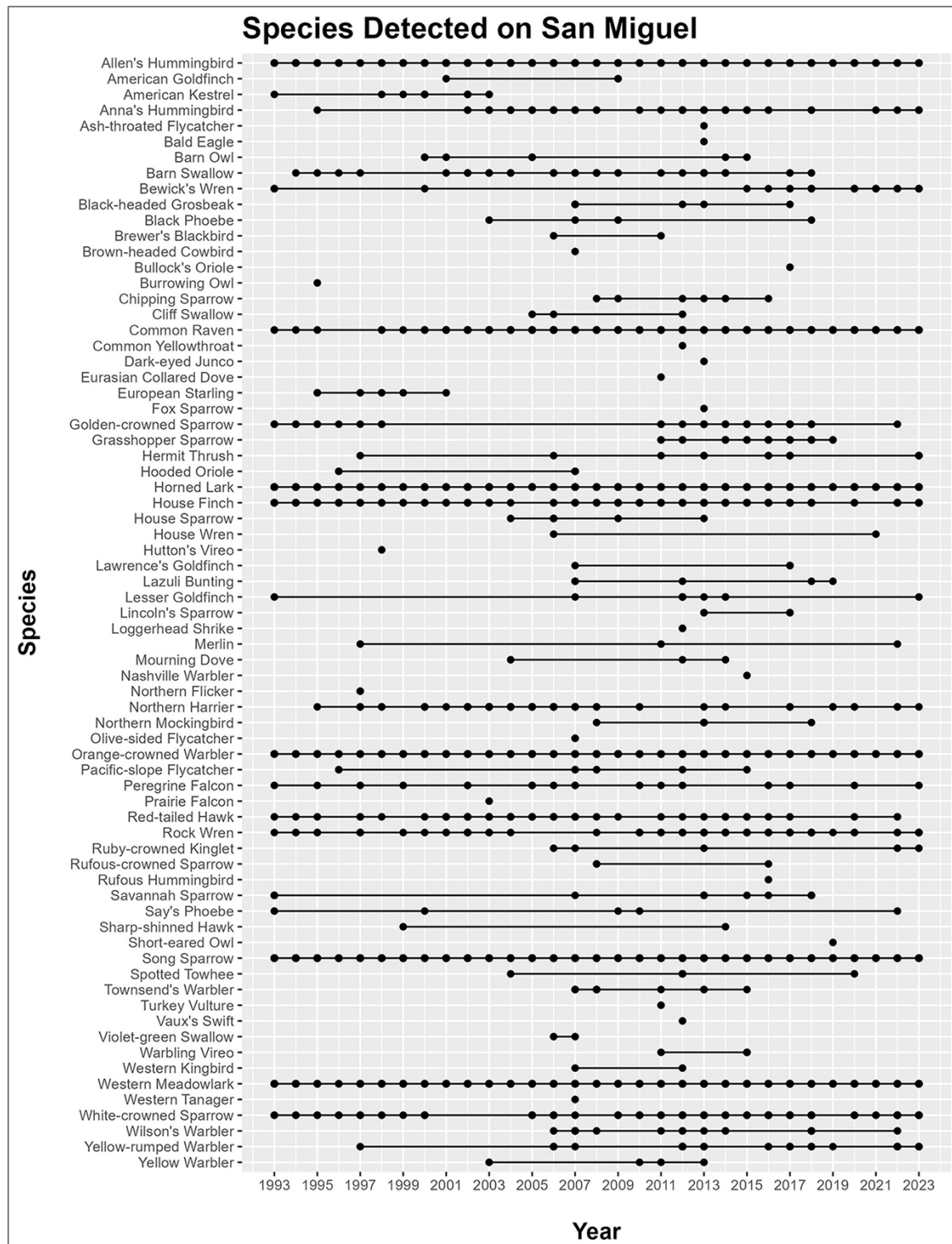


Figure 14. Species occurrence from 1993–2023 for San Miguel Island. A dot indicates that a species was detected at a point count or line transect (prior to 2020) during that year.

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Santa Rosa Island

Since 1994, 77 landbird species have been counted on Santa Rosa Island (Figure 15); 35 were detected in 2023 (Table 2). Chipping Sparrow for the third consecutive year was counted near or below the first quartile of its abundance average (Figure 10). Dark-eyed Junco was counted for the first time since 2015 (Figure 15). No new transients were recorded in 2023; 21 transient or visiting species have been counted on the island since 1994 (Table 3).

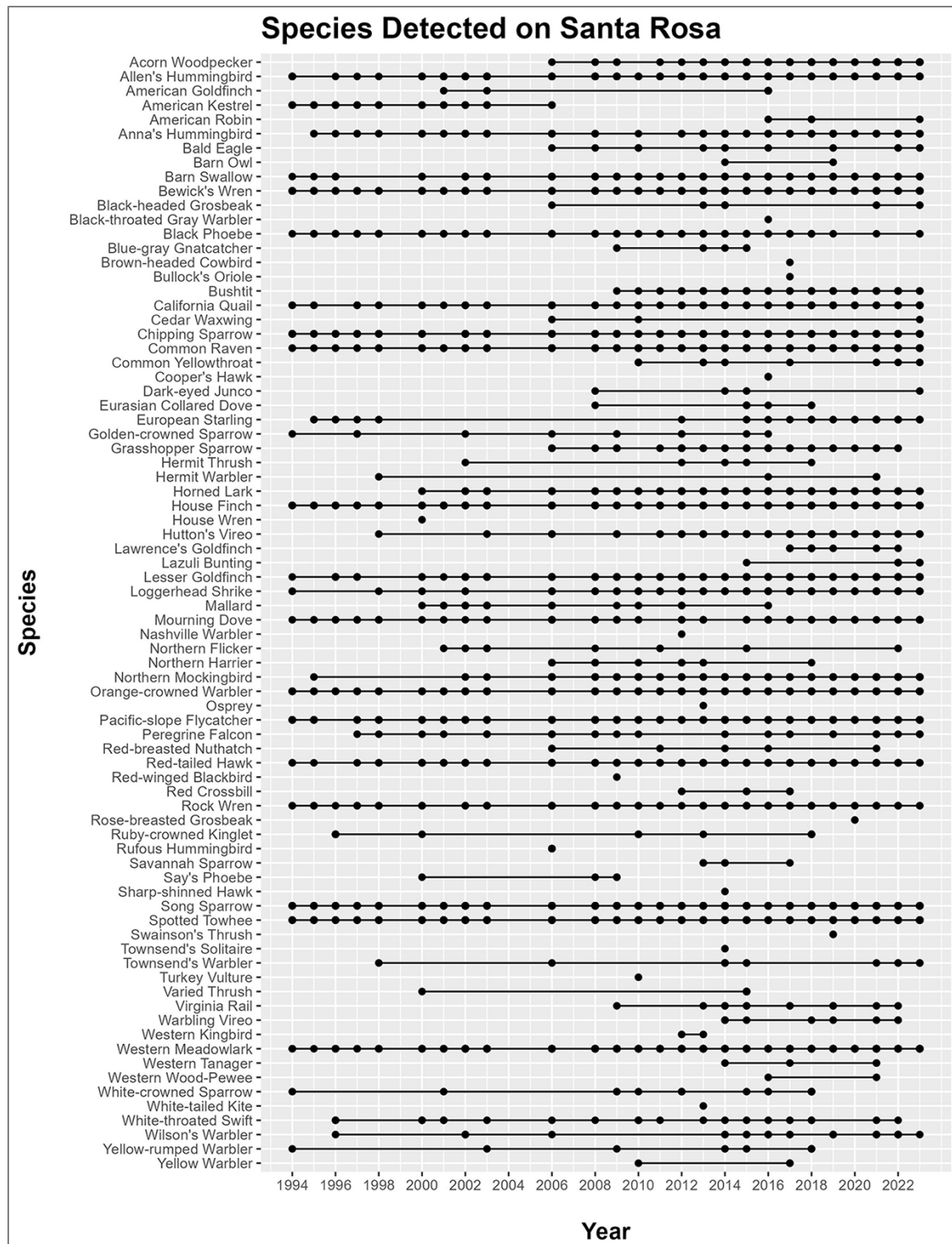


Figure 15. Species occurrence from 1994–2023 for Santa Rosa Island. A dot indicates that a species was detected at a point count or line transect (prior to 2020) during that year.

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Additional Observations

Additional migrant and notable sightings (not counted but seen anecdotally on the islands) were: ten Greater White-fronted Geese, one Burrowing Owl, one American Kestrel, one Northern Flicker, one Tree Swallow, and one Lincoln Sparrow on Santa Barbara Island. One Osprey, two Rock Wrens, and four Savannah Sparrows on East Anacapa Islet. One Turkey Vulture, one Warbling Vireo, and one Lincoln Sparrow on Santa Cruz Island. Grasshopper Sparrows were heard singing near Green Mountain on San Miguel, but no individuals were recorded during counts. One juvenile Bald Eagle, one Anna's Hummingbird, one White-throated Swift, and one Black-throated Gray Warbler were observed on San Miguel. One Olive-sided Flycatcher, one Warbling Vireo, one Wilson's Warbler, one Townsend's Warbler, and one Lawrence's Goldfinch were observed on Santa Rosa Island.

Non-Native and Parasitic Bird Species

Non-native birds were counted only on Santa Rosa Island in 2023: 11 European Starlings (Tables 2, 4). However, anecdotal sightings from eBird reports of non-native birds were reported for Santa Rosa and Santa Cruz islands, but not for the small islands (Table 4). The highest eBird numbers of non-native species occurred on Santa Cruz Island, with 26 detections of Eurasian Collared-Doves (primarily in the Central Valley). This was the first time in three years that House Sparrow was recorded on Santa Cruz Island (at Scorpion; Table 4).

Table 4. Summary of anecdotal observations of non-native and parasitic bird species observed on CHIS. Observations were reported to eBird (<https://ebird.org/home>) in 2023 (accessed August 2023).

Island	Eurasian Collared-Dove	Rock Pigeon	European Starling	Brown-headed Cowbird	House Sparrow
Santa Barbara	0	0	0	0	0
East Anacapa	0	0	0	0	0
Santa Cruz	26	1	7	3	3
Santa Rosa	6	0	2	1	0
San Miguel	0	0	0	0	0
Total	32	1	9	4	3

Discussion

Across all islands, 53 terrestrial bird species were counted at Channel Islands National Park in 2023. Again in 2023, species richness was greatest on the larger islands (43 on Santa Cruz and 35 on Santa Rosa islands), as predicted by island biogeography, and least on the smallest islands (10 on Santa Barbara, 6 on East Anacapa).

Southern California experienced historic rain events across the region in the winter of 2022/2023 and spring 2023. The rain caused road closures on Santa Cruz and Santa Rosa islands for the entirety of the 2023 monitoring season. Although surveyors were able to complete monitoring at all stations on both islands, logistical planning needed to be more detailed than previous seasons. For example, on Santa Cruz Island, multiple monitoring tours were needed because of road closures, compared to previous seasons when generally only one monitoring tour was needed to complete all surveys.

This was the first year that we conducted repeat counts at Santa Barbara Island and East Anacapa Islet, with the second counts conducted two to four weeks after the first. The recommendation to do two counts was suggested to increase sample size for statistical power and to improve accuracy of density analyses (George 2022; Larramendy et al. 2023), as well as to try to minimize the effect of the noise from loud nesting seabirds on the islands. The results were mixed: observers increased the sample sizes for three species and detected three new species on the second count on Santa Barbara Island (Appendix B) but only increased the count by one individual bird for one species on East Anacapa Islet (Appendix B). Based on these findings and on preliminary power analysis results from A. Royle (in prep), as well as logistical considerations and cost, we recommend that the counts on East Anacapa Islet be stopped; the data are not adequate for meeting the monitoring program objectives. Instead, we suggest that an area search using the main trail be conducted during one morning period (sunrise to no more than four hours after) so that birds can be observed and documented instead of emphasizing acoustic detections given the interference from nesting Western Gulls. Results can be uploaded into eBird, and can be summarized in upcoming reports.

For Santa Barbara Island, we suggest conducting only one count timed either before or after seabirds nest on the island. This might be in late February, or late spring/early summer. Additional conversations will be held with ecologists familiar with seabird biology on the islands before the 2024 season to determine the best approach with the counts. We may also conduct another two-count test in the 2024 season so we can continue to gauge differences between count periods.

Similar to counts made in 2016–2022, each observer in 2023 was skilled at identifying bird species by vocalizations and by sight. As a result of the observers' qualifications, we have high confidence in the observers' detection accuracy. However, it is important to note that inter-observer differences, environmental factors (i.e., variability in wind speeds and fog density), and only one count (replicate) per season at each point count station can all affect the accuracy of estimates of species' numbers. These factors are significant challenges to any monitoring program and should be evaluated carefully to minimize misrepresentation of trends in density.

On Santa Rosa Island, Chipping Sparrows are still showing signs of a possible decline. In 2023, there was an increase in their abundance ($n = 78$) compared to the 2022 season ($n = 50$), however, the 2023 abundance was still below the 25% quartile of average abundance since monitoring began in 1993. Furthermore, a trend analysis performed by NPS and the United States Geological Survey showed a significant decreasing trend for Chipping Sparrows from 2001–2020 (J. A. Royle, personal communication, 3 March 2023). In the 2022 landbird technical report, we recommended increasing sample coverage by conducting repeat visits at stations where Chipping Sparrows occurred in the 2021 and 2022 monitoring seasons (Larramendy et al. 2023, 2025). However, due to winter rains causing road closures and limited staff time on Santa Rosa, repeat visits could not be conducted in 2023.

Lastly, because of continuing starling presence on Santa Rosa Island, we recommend that starling traps be deployed around the ranch area on the island when observers are counting in 2024, and that any captured starlings be humanely euthanized.

We therefore recommend a strategy meeting prior to the 2024 monitoring season to discuss: (1) pushing the counting period for Santa Barbara Island back by one month; (2) conducting repeat visits to Santa Rosa Island in 2024 for Chipping Sparrows; and (3) deploying starling traps.

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Appendix A: Resident Breeder Species List

Table 5 consists of a list of 54 terrestrial avian species confirmed to be nesting on at least one of the five northern Channel Islands monitored in this study (East Anacapa, Santa Barbara, Santa Cruz, San Miguel, and Santa Rosa). Data on nesting status from Collins and Jones (2015). The list does not include either exclusively marine species that are not monitored during the landbird program, or species only suspected of breeding on an island.

Table 5. Resident breeding landbirds on at least one of the five islands in Channel Islands National Park.

Scientific Name	Common Name
<i>Melanerpes formicivorus</i>	Acorn Woodpecker
<i>Selasphorus sasin</i>	Allen's Hummingbird
<i>Fulica americana</i>	American Coot
<i>Falco sparverius</i>	American Kestrel
<i>Turdus migratorius</i>	American Robin
<i>Calypte anna</i>	Anna's Hummingbird
<i>Myiarchus cinerascens</i>	Ash-throated Flycatcher
<i>Haliaeetus leucocephalus</i>	Bald Eagle
<i>Tyto alba</i>	Barn Owl
<i>Hirundo rustica</i>	Barn Swallow
<i>Thryomanes bewickii</i>	Bewick's Wren
<i>Pheucticus melanocephalus</i>	Black-headed Grosbeak
<i>Sayornis nigricans</i>	Black Phoebe
<i>Polioptila caerulea</i>	Blue-gray Gnatcatcher
<i>Psaltiriparus minimus</i>	Bushtit
<i>Callipepla californica</i>	California Quail
<i>Catherpes mexicanus</i>	Canyon Wren
<i>Spizella passerina</i>	Chipping Sparrow
<i>Corvus corax</i>	Common Raven
<i>Accipiter cooperii</i>	Cooper's Hawk
<i>Junco hyemalis</i>	Dark-eyed Junco
<i>Sturnus vulgaris</i>	European Starling
<i>Ammodramus savannarum</i>	Grasshopper Sparrow
<i>Icterus cucullatus</i>	Hooded Oriole
<i>Eremophila alpestris</i>	Horned Lark
<i>Haemorhous mexicanus</i>	House Finch
<i>Vireo huttoni</i>	Hutton's Vireo
<i>Aphelocoma insularis</i>	Island Scrub-Jay

Table 5 (continued). Resident breeding landbirds on at least one of the five islands in Channel Islands National Park.

Scientific Name	Common Name
<i>Charadrius vociferus</i>	Killdeer
<i>Spinus psaltria</i>	Lesser Goldfinch
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<i>Anas platyrhynchos</i>	Mallard
<i>Zenaida macroura</i>	Mourning Dove
<i>Colaptes auratus</i>	Northern Flicker
<i>Circus hudsonius</i>	Northern Harrier
<i>Mimus polyglottos</i>	Northern Mockingbird
<i>Aegolius acadicus</i>	Northern Saw-whet Owl
<i>Oreothlypis celata</i>	Orange-crowned Warbler
<i>Empidonax difficilis</i>	Pacific-slope Flycatcher
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Phainopepla nitens</i>	Phainopepla
<i>Sitta canadensis</i>	Red-breasted Nuthatch
<i>Buteo jamaicensis</i>	Red-tailed Hawk
<i>Agelaius phoeniceus</i>	Red-winged Blackbird
<i>Columba livia</i>	Rock Pigeon
<i>Salpinctes obsoletus</i>	Rock Wren
<i>Aimophila ruficeps</i>	Rufous-crowned Sparrow
<i>Asio flammeus</i>	Short-eared Owl
<i>Melospiza melodia</i>	Song Sparrow
<i>Pipilo maculatus</i>	Spotted Towhee
<i>Tachycineta thalassina</i>	Violet-green Swallow
<i>Rallus limicola</i>	Virginia Rail
<i>Sturnella neglecta</i>	Western Meadowlark
<i>Aeronautes saxatalis</i>	White-throated Swift

Appendix B: Comparison of First and Second Count Totals on Santa Barbara Island and East Anacapa Islet

This appendix contains information about the number of birds and species observed during each of two counts on Santa Barbara Island (Table 6) and East Anacapa Islet (Table 7) in 2023.

Table 6. Total counts for Santa Barbara Island for species observed in late February/early March (first count) and late March/early April 2023 (second count).

Species	Total First Count	Total Second Count
Barn Owl	0	1
Common Raven	0	2
Golden-crowned Sparrow	0	1
House Finch	3	2
Horned Lark	169	225
Northern Harrier	1	0
Orange-crowned Warbler	1	7
Peregrine Falcon	3	3
Rock Wren	1	0
Say's Phoebe	4	0
Savannah Sparrow	22	12
White-crowned Sparrow	124	173
Western Meadowlark	29	7

Table 7. Total counts for East Anacapa Islet for species observed in early March (first count) and mid-April 2023 (second count).

Species	Total First Count	Total Second Count
Common Raven	4	0
Golden-crowned Sparrow	0	1
Peregrine Falcon	2	0
Say's Phoebe	1	0
Song Sparrow	6	2
White-crowned Sparrow	32	8

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