



Landbird Monitoring

2022 Results from Crater Lake National Park, Lassen Volcanic National Park, Oregon Caves National Monument and Preserve, and Whiskeytown National Recreation Area



Pacific Wren.

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Landbird monitoring: 2022 results from Crater Lake National Park, Lassen Volcanic National Park, Oregon Caves National Monument and Preserve, and Whiskeytown National Recreation Area

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Jaime L. Stephens, Thomas H. McLaren, Caitlyn R. Gillespie, Claire Stuyck

Klamath Bird Observatory

PO Box 758

Ashland, OR 97520

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Contents

	Page
Figures.....	iv
Tables	v
Abstract.....	vi
Acknowledgments.....	vii
Introduction.....	1
Methods.....	3
Sampling Design	3
Field Surveys.....	4
Monitoring Schedule	4
Training	9
Variable Circular Plot Point Count.....	9
Constant Effort Monitoring Station.....	9
Species Checklists	9
Habitat Surveys	10
Data	10
Data Delivery.....	10
Data Analysis.....	10
Results.....	11
Crater Lake National Park.....	11
Lassen Volcanic National Park	20
Whiskeytown National Recreation Area	29
Oregon Caves National Monument and Preserve	38
Oregon Caves National Monument and Preserve Ecological Monitoring Station.....	46
Summary.....	50
Literature Cited	52

Figures

	Page
Figure 1. Crater Lake National Park is located in southern Oregon.	5
Figure 2. Lassen Volcanic National Park is located in northern California.	6
Figure 3. Whiskeytown National Recreation Area is located in northern California.....	7
Figure 4. Oregon Caves National Monument and Preserve is located in southern Oregon.....	8
Figure 5. Point count routes at long-term landbird monitoring sites in Crater Lake National Park.	12
Figure 6. Point count routes at long-term landbird monitoring sites in Lassen Volcanic National Park.	21
Figure 7. Point count routes at long-term landbird monitoring sites in Whiskeytown National Recreation Area.	29
Figure 8. Point count routes at long-term landbird monitoring sites in Oregon Caves National Monument and Preserve.....	39

Tables

	Page
Table 1. Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019 and 2022 point count surveys at Crater Lake National Park, and proportion of routes with detections for each species in 2022.....	13
Table 2. List of additional species detected at Crater Lake National Park in 2022 (not counted within 50 m during variable circular plot point count surveys) and conservation status.	19
Table 3. Mean relative abundance (RA) for bird species detected within 50 m/point during 2010, 2012, 2015, 2018, and 2022 point count surveys at Lassen Volcanic National Park, and proportion of routes with detections for each species in 2022.....	22
Table 4. List of additional species detected at Lassen Volcanic National Park in 2022 (not counted within 50 m during variable circular plot point count surveys), and their associated conservation or observation status according to other entities.	28
Table 5. Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022.	30
Table 6. List of additional species detected at Whiskeytown National Recreation Area in 2022 (not counted within 50 m during variable circular plot point count surveys) and conservation status.	37
Table 7. Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019, and 2022 point count surveys at Oregon Caves National Monument and Preserve, and proportion of routes with detections for each species in 2022.....	40
Table 8. List of additional species detected at Oregon Caves National Monument and Preserve in 2022 (not counted within 50 m during variable circular plot point count surveys) and conservation status.....	44
Table 9. Results from the constant effort monitoring station at Oregon Caves National Monument and Preserve in 2022, showing total mist net captures and relative abundance (birds/area search plot) during breeding (1 June to 24 August) and migration (8 September to 12 October), and conservation status.	47

Abstract

In 2022, the Klamath Inventory and Monitoring Network (KLMN) of the National Park Service implemented the 14th year of a long-term landbird monitoring protocol. Klamath Bird Observatory, in partnership with the KLMN, developed the protocol and completed this 14-year effort. Multiple standard avian sampling methods were implemented, including variable circular plot point counts, area search surveys, mist netting, species checklists, and habitat surveys. In 2022, a fifth year of point counts was completed, along with corresponding species checklists and habitat surveys, at 35 locations within Crater Lake National Park, 4 locations within Oregon Caves National Monument and Preserve, 24 locations within Lassen Volcanic National Park, and 30 locations within Whiskeytown National Recreation Area. Unlike in previous years, 4 rather than 2 national park units were monitored. This change in survey effort was made to compensate for surveys that were missed during 2020 when no monitoring was conducted due to the emergence of the COVID-19 pandemic. The operation of an ongoing constant effort monitoring station, which included mist netting, point counts, area searches, species checklists, and habitat surveys, continued at Oregon Caves National Monument and Preserve during the breeding and fall migration seasons. Relative abundance (birds/station), as measured by point count and area search methods, was calculated for all survey sites combined within each park. Total captures, by season, were calculated using constant effort mist netting data. Species of conservation importance were among the most abundant species at each park. Results are presented along with conservation status of individual species based on Partners in Flight state and continental plans and Oregon and California Wildlife Conservation Strategies. This 14th year of implementation of the KLMN landbird monitoring program continued to lay the groundwork for improved understanding of landbird status and long-term trends in each park. When analyzed in the framework of the Klamath Bird Monitoring Network, the contribution of KLMN parks to bird conservation in this region will help inform landbird conservation in the West.

Acknowledgments

We thank John Alexander, Kathryn Irvine, Sean Mohren, and Daniel Sarr for their contributions to the landbird monitoring protocol. Implementation of the monitoring program would not have been possible without the help of both network and park staff. Special thanks to Alice Chung-MacCoubrey, Eric Dinger, Russ Weatherbee, Laura Shaskey, Jason Walz, Ivan Yates, Mike Magnuson, Nancy Nordensten, Sean Mohren, Jennifer Gibson, and Kathy Whyte for their logistical support in 2022. We appreciate Allison Snyder's support for data management. The dedication of the field crews made this season successful. Point count surveys were completed by Will Harrod, Azita Roshani, Dylan Hendry, Amber Darbyshire, Ryan McGinty, Hayleigh Johnson, and Sarah Beres. The constant effort monitoring station was run by Claire Stuyck and student volunteer interns: Victoria Langham, Axel Rutter, Yuly Lorena Caicedo Ortiz, Victor Armando Sanchez Gonzalez, Molly Heal, and Zoya Buckmire. We appreciate edits and comments from Sarah Rockwell that improved this report.

Introduction

In 2022, the Klamath Inventory and Monitoring Network (KLMN) of the National Park Service (NPS) implemented the 14th year of their long-term landbird monitoring protocol (Stephens, Mohren et al. 2010). Klamath Bird Observatory, in partnership with the KLMN, developed the protocol and has conducted the monitoring since 2008. This annual report provides a summary of 2022 efforts, including (1) a summary of the monitoring protocol, (2) a summary of point count and area search surveys and constant effort monitoring visits, and (3) a summary of birds detected at each of the park units where monitoring occurred.

The KLMN monitors natural resources in parks of southern Oregon and northern California, including Crater Lake National Park (CRLA), Lava Beds National Monument (LABE), Lassen Volcanic National Park (LAVO), Oregon Caves National Monument and Preserve (ORCA), Redwood National and State Parks (RNSP), and Whiskeytown National Recreation Area (WHIS). These park units fall within the Klamath Region. This region includes a broad range of topography, elevation, and corresponding climate and vegetation. The region is recognized for its rich biodiversity, which is represented by diverse avifauna (Trail et al. 1997; DellaSala et al. 1999; Stephens et al. 2016).

Landbird monitoring contributes to the vital signs monitoring program that has been developed by the KLMN (Sarr et al. 2007). A landbird monitoring protocol was designed to yield important information about avian community composition, status of landbirds in a given year, and long-term population trends of specific species for each KLMN park unit (Stephens, Mohren et al. 2010). The avian sampling methods incorporated in this protocol include point count surveys, constant effort mist netting, area search surveys, and a compilation of species checklists at specific sites. The methodology selected for each park was based on park unit size, habitat composition, and historical bird monitoring efforts (Stephens, Mohren et al. 2010).

KLMN landbird monitoring contributes to regional and continental bird monitoring programs and aligns with the U.S. North American Bird Conservation Initiative Monitoring Subcommittee recommendations for improving avian monitoring (US NABCI 2007). In addition, KLMN landbird monitoring is integrated with an extensive regional bird monitoring network. The Klamath Bird Monitoring Network is a bird monitoring partnership that extends across the Klamath-Siskiyou Bioregion (Alexander et al. 2004). It has been coordinated by the Klamath Bird Observatory and U.S. Forest Service Redwood Sciences Laboratory for over 20 years. This effort has yielded a substantial regional dataset with information about landbird distribution, population trends, and population demographics (Alexander et al. 2004). Additionally, data are contributed to Avian Knowledge Northwest, a regional node of the Avian Knowledge Network. The KLMN landbird monitoring program also fits within continental monitoring programs, including the Landbird Monitoring Network of the Americas (Alexander and Ralph 2005) and the Monitoring Avian Productivity and Survivorship Program (DeSante et al. 2004).

The KLMN landbird monitoring effort is informed by and contributes to the Partners in Flight (PIF) landbird conservation initiative. Regional and continental PIF habitat-based bird conservation

objectives are met through the implementation of the NPS mission to preserve natural resources unimpaired for future generations. Partners in Flight conservation plans and state wildlife conservation strategies provide a framework for understanding landbird status in the parks. Recently, long-term monitoring data from the 6 park units were applied to test the PIF focal species approach against site-specific empirical data (Stephens, Dinger, and Alexander 2019). We use these resources to frame the results of the KLMN landbird monitoring efforts.

The objectives of the *Klamath Network Landbird Monitoring Protocol* are to:

1. Monitor breeding landbird richness, relative abundance, and density.
2. Co-sample habitat parameters and integrate bird and vegetation monitoring to aid in interpretation of landbird status and trends.
3. Determine status and trends in demographic parameters (productivity, adult survival, and recruitment) for selected landbird species in a mixed-conifer and riparian habitat at Oregon Caves National Monument and Preserve.

This annual report provides an overview of methodology and implementation of yearly field surveys. Results presented in this report are limited to general information about bird presence and abundance. Additional analysis and synthesis reports are completed every third year, to include results of species detectability and density, community and habitat structure, and landbird status and trends (Gillespie et al. in review; Rockwell et al. 2016; Stephens, Dinger, and Alexander 2019; Stephens et al. 2016; Stephens, Mohren, Barton et al. 2013; Stephens, Mohren, Newell et al. 2013).

Methods

Sampling Design

The KLMN landbird monitoring protocol incorporates multiple standard avian sampling methods (Ralph et al. 1993; Stephens, Mohren et al. 2010), including variable circular plot point counts, area search surveys, mist netting, species checklists, and habitat surveys. The use of these complementary methods, which gather information about multiple bird species, optimizes the amount of information gathered about birds in each park. Twenty-five to 35 point count routes were established at each park unit corresponding to park unit size, with the exception of Oregon Caves National Monument and Preserve. Due to the relatively small size of the monument, monitoring includes a constant effort mist net station and 4 point count routes.

The sampling frames for Crater Lake National Park, Lassen Volcanic National Park, Lava Beds National Monument, and Redwood National and State Parks include locations between 100 m and 1000 m from a road or trail. The roads and trails within KLMN park units cross most environmental gradients. Further refinement of sampling frames considered 3 potential elevation and habitat-associated frames (high elevation; riparian; and matrix, which includes all non-high elevation and non-riparian areas) and varied by park (Sarr et al. 2007). At Whiskeytown National Recreation Area, the sampling frame was limited to roads, trails, and power lines for safety reasons. At Oregon Caves National Monument and Preserve we established sampling locations within the monument and the expanded area (the “preserve”) and applied a slightly different sampling frame to each. Within the monument, the sampling frame included locations between 100 m and 1000 m from a road and within 1000 m of a trail (i.e., locations could be established within 100 m of a trail). Because of the high density of trails, this sampling frame was necessary in order to place a point count route within the monument. The sampling frame within the preserve included locations between 100 m and 1000 m from a road or trail.

We used the Generalized Random Tessellation Stratified (GRTS) method (Stevens and Olsen 2004) to develop spatially balanced sampling locations of point count sites within each sampling frame. The number of point count sites varies by park and is based on park size: Crater Lake National Park ($n = 35$), Lassen Volcanic National Park ($n = 25$), Lava Beds National Monument ($n = 25$), Oregon Caves National Monument and Preserve ($n = 4$), Redwood National and State Parks ($n = 30$), and Whiskeytown National Recreation Area ($n = 30$). Beginning in 2021, the sample size at Redwood National and State Parks was reduced from 30 sites to 15, to allow surveyors to work in pairs for safety reasons. At each point count site, a series of stations are surveyed in a single morning, referred to as a point count route. The number of point count stations on a route is typically determined by time constraints; optimally, 12 stations are surveyed within each route, which is the case for all routes in all parks with the exception of Lassen Volcanic National Park and Redwood National and State Parks. At Lassen Volcanic National Park 3 points were dropped during the initial year of protocol implementation due to safety and time constraints. Because of the rugged terrain at Redwood National and State Parks, the number of established point count stations varies from 6 to 8 for each route. Stations were placed 250 m apart, which nearly eliminates the likelihood of double counting birds (Scott et al. 1981). Point count stations are sampled during the breeding season (early

May through early July) using 5-minute count periods following the variable circular plot (VCP) methodology that incorporates distance sampling (Reynolds et al. 1980; Fancy 1997; Nelson and Fancy 1999).

At Oregon Caves National Monument and Preserve, an ongoing constant effort monitoring station is operated following standard protocols (Ralph et al. 2004; Stephens, Mohren et al. 2010) during the breeding season as well as during the fall dispersal and migration seasons. In previous years, we defined the breeding season as early May through late August and the migration season as late August through mid-October. In 2021 and beyond, we adjusted this framework to redefine breeding as May through August 9th and fall dispersal and migration as August 10th through October. This follows the definition from the Monitoring Avian Productivity and Survivorship (MAPS) program (DeSante et al. 2021) and better aligns with the life history of landbirds in our region. This change does not affect the total number of survey efforts. This is a sentinel site, which was selected subjectively as a location of special interest due to habitat characteristics. Specifically, this site was selected because of riparian habitat and accessibility by trail.

Field Surveys

Monitoring Schedule

In accord with the KLMN landbird monitoring protocol, each of the 6 park units is to be monitored every third year using point counts and associated methodologies. The first round of visits was completed from 2008 to 2010, the second round from 2011 to 2013, the third round from 2014 to 2016, the fourth round from 2017 to 2019, and the fifth round of visits began in 2021. The parks are paired in a given survey year such that Redwood National and State Parks and Lava Beds National Monument are surveyed in year one, Lassen Volcanic National Park and Whiskeytown National Recreation Area in year two, and Crater Lake National Park and Oregon Caves National Monument and Preserve in year three. However, during the first round of surveys, Lassen Volcanic National Park was completed in 2010 (year 3) rather than 2009 (year 2) due to logistical challenges with site establishment in 2009. Surveys were not implemented in 2020 due to the COVID-19 pandemic. In 2021, we completed the fifth round of visits at Lava Beds National Monument and Redwood National and State Parks. Beginning in 2021, surveys at Redwood National and State Parks have been completed in pairs for safety reasons. As a result, only 15 out of 30 established routes will be surveyed moving forward. In 2022, 4 national park units (Crater Lake National Park, Lassen Volcanic National Park, Oregon Caves National Monument, and Whiskeytown National Recreation Area) were surveyed instead of 2 to compensate for surveys missed in 2020 due to the emerging COVID-19 pandemic (Figures 1–4). In addition, in 2022 we continued the annual operation of the constant effort monitoring station at Oregon Caves National Monument and Preserve.

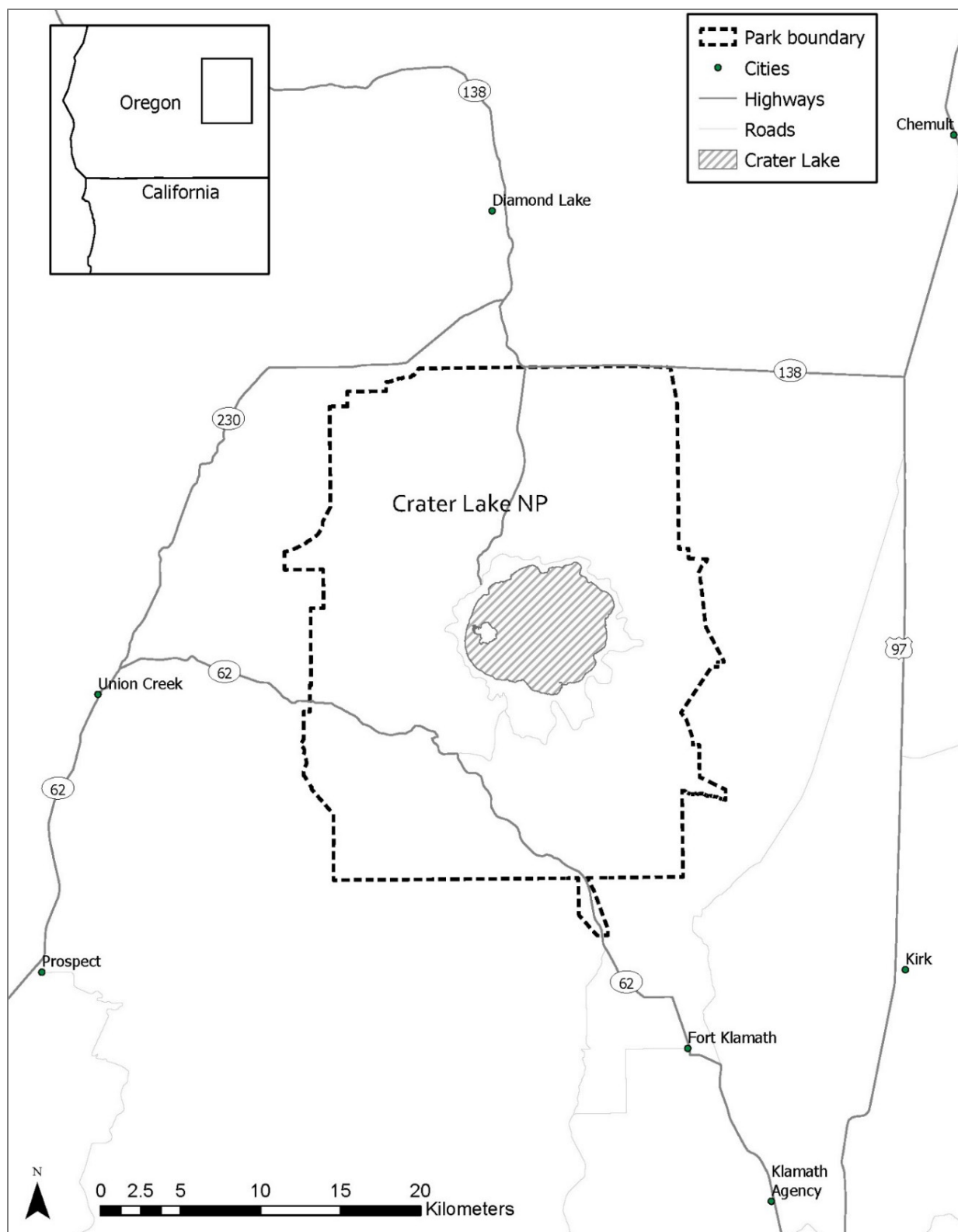


Figure 1. Crater Lake National Park is located in southern Oregon.

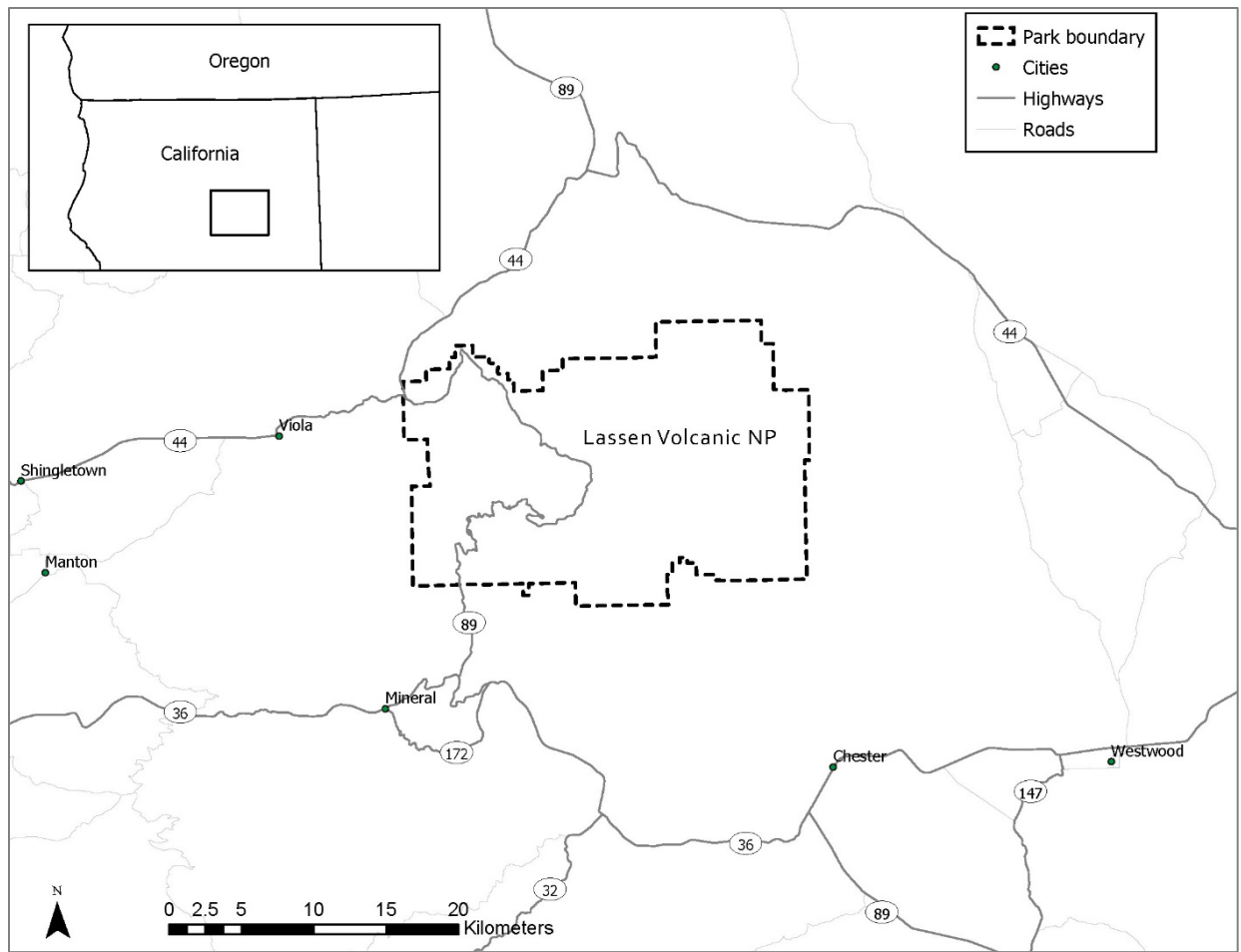


Figure 2. Lassen Volcanic National Park is located in northern California.

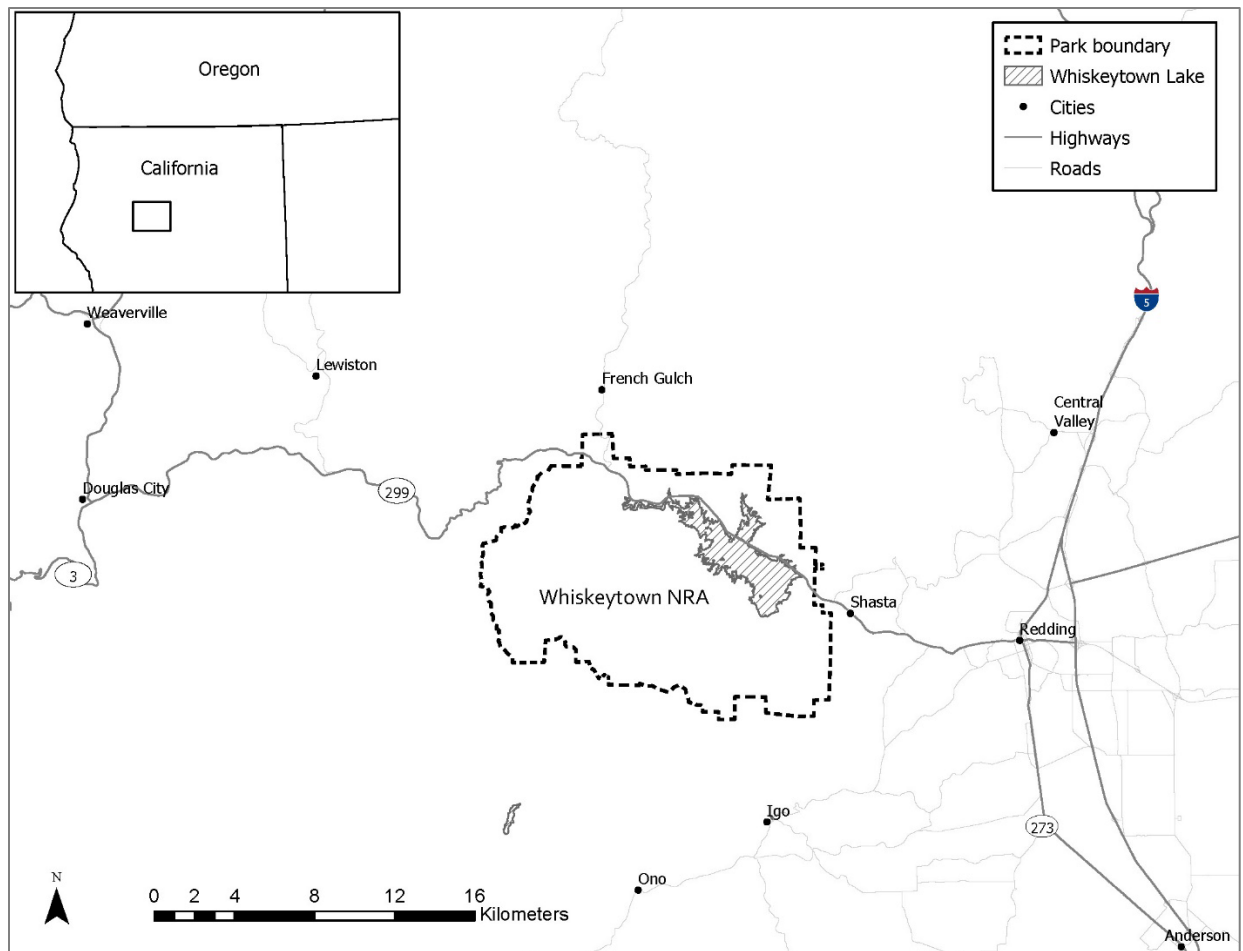


Figure 3. Whiskeytown National Recreation Area is located in northern California.

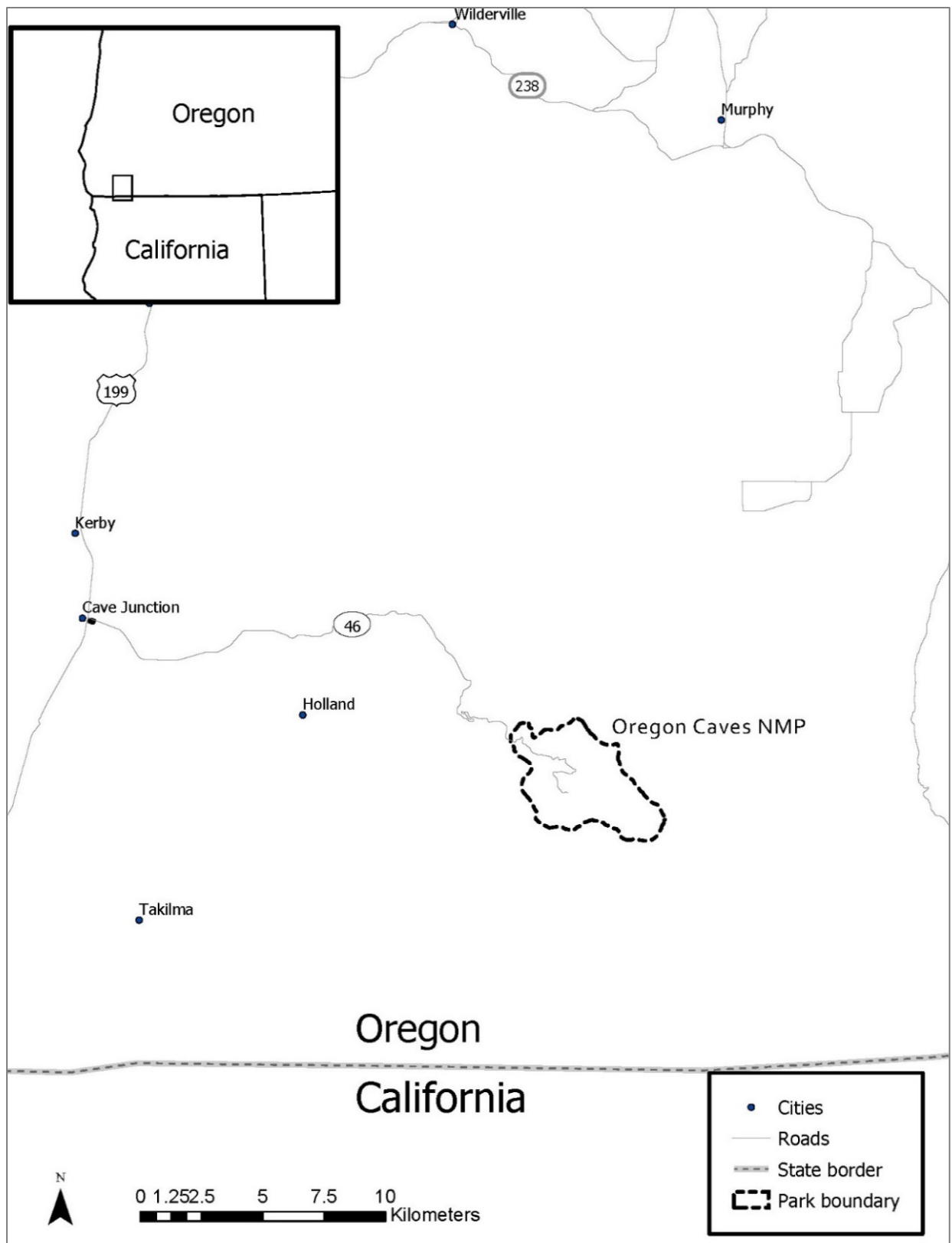


Figure 4. Oregon Caves National Monument and Preserve is located in southern Oregon.

Training

Point count surveyors all had previous experience with point count methodology and were proficient with western bird species identification by sight and sound. At the onset of the field season, point count surveyors participated in a 3-day to 2-week-long training session, depending on experience. Training exercises included group calibration for distance estimation and simultaneous point count and vegetation surveys in the field. A certification test for bird species identification, which included various written and audio exercises, was completed by all point count surveyors. Interns that operated the constant effort monitoring station underwent ongoing training throughout the season. Benchmarks were noted for proficiency with bird extraction and handling, bird identification, and data collection. A primary bander who had undergone certification operated the station, with the assistance of interns who were at varying levels within the training program.

Variable Circular Plot Point Count

Point count surveys began within 15 minutes of sunrise. The observer used a digital rangefinder to establish distance reference points at each station prior to conducting the survey. During a 5-minute count period, all birds detected by sight or sound were identified to species and recorded on data forms, along with the horizontal distance to each bird, estimated as accurately as possible and rounded to the nearest meter. In addition, for each individual, the time of detection (rounded to the previous minute), detection type (e.g., visual, song, call), and breeding status were also recorded. All point count stations along a given route (or as many stations as possible) were completed by a single surveyor within 4 hours of sunrise.

Constant Effort Monitoring Station

The constant effort monitoring station incorporated a variety of survey methods to sample avian species, including mist netting, area searches, point counts, species checklists, and habitat surveys. The mist netting station at Oregon Caves National Monument and Preserve had 10 nets set in an array. This arrangement optimized bird capture and met logistical constraints. Mist nets were opened within 15 minutes of sunrise and operated for 5 hours. Nets were not operated during inclement weather conditions that might affect capture rates or bird safety. All birds that were captured were identified to species, aged and sexed according to Pyle (1997), and checked for signs of breeding condition (e.g., cloacal protuberances and brood patches); additional biometrics were collected. All captured birds, excluding hummingbirds and game birds, were banded with a U.S. Geological Survey Bird Banding Laboratory aluminum butt-end leg band.

Two area search surveys were completed at the mist net site on each day the site was operated. This method provided additional information, such as presence and breeding status of most of the birds occurring at the site, including those not often captured in the nets (e.g., canopy dwelling warblers). During an area search, the surveyor moved around the designated area for a 20-minute period, recording all birds seen or heard. The 2 area search plots at Oregon Caves National Monument and Preserve were approximately 0.4 and 0.6 hectares in size.

Species Checklists

Species checklists were completed in conjunction with all bird monitoring efforts, including point count, habitat, and area search surveys and mist netting. Species checklists added value to survey

data by documenting encounters of all species during an effort. Checklists enabled surveyors to record information on common and rare species that may or may not have been detected using the other survey techniques.

Habitat Surveys

In addition to avian surveys, habitat surveys were completed at each point count station and at the constant effort monitoring station following a standard methodology (Ralph et al. 1993). The surveys were designed specifically to account for habitat aspects associated with the feeding and nesting requirements of birds. The habitat sampling was conducted using a vegetation relevé method that was suitable for any vegetation type and provided an efficient assessment of vegetation composition and structure. Ocular estimates of cover and height for all vegetation layers, tree and shrub species, and other plant forms were recorded, along with snag counts, presence of water, evidence of burns, and tree size and height. Habitat data will be used as part of several larger analyses as described in the KLMN landbird monitoring protocol (Stephens, Mohren et al. 2010).

Data

Data Delivery

Mist Net, Mist Net Hours, Vegetation, and Area Search data were entered into relational Access databases. Point Count and Checklist data were entered directly into Avian Knowledge Network's online interface and were later downloaded and brought into an Access database for delivery to KLMN. The verified, validated, and certified data were submitted to the KLMN, where they were uploaded into one relational database designed using the NPS natural resource database template.

Data Analysis

Relative abundance (birds/station), as measured by point counts and area search surveys, was calculated for all survey points combined within each park. Only species detected within 50 m of point count survey stations and within the established area search plots were included in abundance calculations. We also calculated the proportion of point count routes on which a given species was detected out of the total number of routes surveyed in each park. Total captures, by season, were calculated using constant effort mist net data. Partners in Flight focal species, which are indicative of a variety of ecosystem components (Altman and Alexander 2012; CalPIF 2002a, 2002b, 2004, 2005; RHJV 2004; Rosenberg et al. 2016; Rockwell et al. 2022), and conservation status from the Oregon and California State Wildlife Conservation Strategies (CDFW 2015; ODFW 2016) are highlighted in the results where applicable.

Results

Crater Lake National Park

In 2022 we surveyed 35 of 35 permanent point count survey routes at Crater Lake National Park, each consisting of 12 survey stations (Figure 5). The sampling frame at Crater Lake National Park includes both matrix (i.e., all non-high elevation and non-riparian areas, 31 routes) and alpine (4 routes) areas. Alpine areas are defined as elevation >2057 m. Surveys were completed from June 14th to July 13th by Will Harrod, and Azita Roshani. The 2022 point count surveys recorded 52 species within 50 m of the stations (Table 1). An additional 16 species were recorded outside of 50 m during point count surveys or encountered between bird surveys or during vegetation surveys and accounted for on species checklists (Table 2). Sixty-five species have been detected within 50 m of the stations during at least 1 of 5 survey years, and a total of 25 species have been detected within 50 m of the stations throughout all 5 years of surveys. Species detected at Crater Lake for the first time in 2022 include American Crow, Black-capped Chickadee, Black-throated Gray Warbler, Warbling Vireo, Purple Finch, White-breasted Nuthatch, Bullock's Oriole, and Brewer's Blackbird.

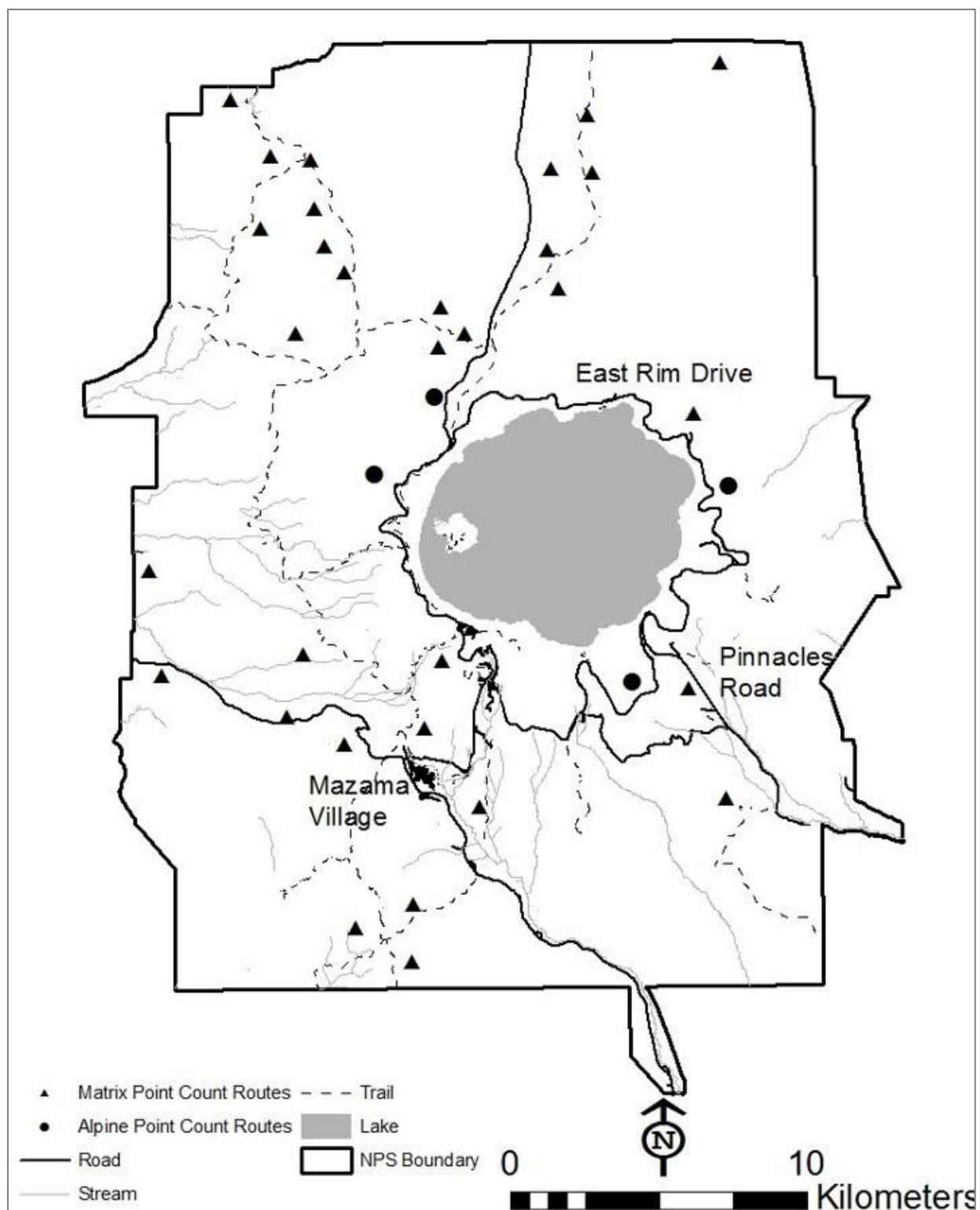


Figure 5. Point count routes at long-term landbird monitoring sites in Crater Lake National Park.

Table 1. Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019 and 2022 point count surveys at Crater Lake National Park, and proportion of routes with detections for each species in 2022. We performed a data correction for a single observer in 2010 who appeared to consistently underestimate distance (Stephens, Mohren, Newell et al. 2013) by doubling all of this observer’s detection distances before analysis, thereby making the 2010 Crater Lake results more comparable to other years. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	OR/WA PIF Eastslope ²	Cont PIF Northern Pacific Rainforest ^{3,4}	Cont PIF Great Basin ^{3,4}	ODFW West Cascades ⁴	ODFW East Cascades ⁴
Red-breasted Nuthatch	<i>Sitta canadensis</i>	0.223	0.179	0.24	0.506	0.395	0.714	–	–	–	–	–	–
Pine Siskin	<i>Spinus pinus</i>	2.674	0.11	0.09	0.337	0.639	0.771	–	–	D	D	–	–
Yellow-rumped Warbler	<i>Setophaga coronata</i>	0.275	0.212	0.333	0.382	0.433	0.886	–	–	–	–	–	–
Mountain Chickadee	<i>Poecile gambeli</i>	0.485	0.093	0.131	0.364	0.316	0.886	–	X	–	–	–	–
Dark-eyed Junco	<i>Junco hyemalis</i>	0.373	0.331	0.519	0.496	0.285	0.8	–	–	–	–	–	–
American Robin	<i>Turdus migratorius</i>	0.14	0.071	0.06	0.142	0.27	0.857	–	–	–	–	–	–
Western Tanager	<i>Piranga ludoviciana</i>	0.1	0.021	0.05	0.217	0.199	0.6	X	–	–	–	–	–
Hermit Thrush	<i>Catharus guttatus</i>	0.034	0.05	0.119	0.06	0.179	0.514	X	X	–	–	–	–
Golden-crowned Kinglet	<i>Regulus satrapa</i>	0.181	0.188	0.224	0.214	0.129	0.429	–	–	–	–	–	–
Red Crossbill	<i>Loxia curvirostra</i>	0.331	0.026	0.01	0.042	0.112	0.286	–	–	–	–	–	–
Brown Creeper	<i>Certhia americana</i>	0.26	0.057	0.093	0.177	0.11	0.514	X	X	–	–	–	–
Canada Jay	<i>Perisoreus canadensis</i>	0.064	0.048	0.064	0.062	0.074	0.257	–	–	–	–	–	–
Cassin’s Finch	<i>Haemorhous cassinii</i>	0.02	0.031	0.081	0.05	0.074	0.343	–	–	–	W	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Oregon-Washington Partners in Flight habitat conservation plan for landbirds in the East Cascade Mountains (Altman and Stephens 2022).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁴ Oregon conservation strategy (ODFW 2016).

⁵ Classification of Parulidae species has been revised based on recent genetic work (Chesser et al. 2011).

⁶ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

⁷ Previously grouped with eastern North American and Eurasian species as the Winter Wren, *Troglodytes* (Chesser et al. 2011).

Table 1 (continued). Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019 and 2022 point count surveys at Crater Lake National Park, and proportion of routes with detections for each species in 2022. We performed a data correction for a single observer in 2010 who appeared to consistently underestimate distance (Stephens, Mohren, Newell et al. 2013) by doubling all of this observer’s detection distances before analysis, thereby making the 2010 Crater Lake results more comparable to other years. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	OR/WA PIF Eastslope ²	Cont PIF Northern Pacific Rainforest ^{3,4}	Cont PIF Great Basin ^{3,4}	ODFW West Cascades ⁴	ODFW East Cascades ⁴
Clark’s Nutcracker	<i>Nucifraga columbiana</i>	0.098	0.014	0.026	0.022	0.057	0.343	–	X	–	–	–	–
Steller’s Jay	<i>Cyanocitta stelleri</i>	0.039	0.017	0.026	0.027	0.053	0.314	–	–	–	–	–	–
Hairy Woodpecker	<i>Dryobates villosus</i>	0.029	0.012	0.052	0.05	0.05	0.343	–	–	–	–	–	–
Olive-sided Flycatcher	<i>Contopus cooperi</i>	0	0	0.002	0.012	0.05	0.286	X	X	–	W	X	X
Townsend’s Solitaire	<i>Myadestes townsendi</i>	0.039	0.014	0.021	0.042	0.048	0.286	–	–	–	–	–	–
Mountain Bluebird	<i>Sialia currucoides</i>	0.044	0.007	0.038	0.112	0.043	0.086	–	X	–	–	–	–
Black-backed Woodpecker	<i>Picoides arcticus</i>	0.025	0.029	0.055	0.07	0.041	0.229	–	X	–	–	–	X
Chipping Sparrow	<i>Spizella passerina</i>	0.032	0.017	0.045	0.027	0.041	0.171	–	X	–	–	–	–
Hermit Warbler ⁵	<i>Setophaga occidentalis</i>	0.066	0.007	0.012	0.092	0.033	0.114	–	–	–	–	–	–
Dusky Flycatcher	<i>Empidonax oberholseri</i>	0.02	0	0.021	0.065	0.031	0.143	–	–	–	–	–	–
Northern Flicker	<i>Colaptes auratus</i>	0	0.002	0.002	0.022	0.017	0.086	X	–	–	–	–	–
Pacific-slope Flycatcher ⁶	<i>Empidonax difficilis</i>	0.002	0.002	0.007	0.01	0.017	0.086	X	–	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Oregon-Washington Partners in Flight habitat conservation plan for landbirds in the East Cascade Mountains (Altman and Stephens 2022).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

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⁶ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

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Table 1 (continued). Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019 and 2022 point count surveys at Crater Lake National Park, and proportion of routes with detections for each species in 2022. We performed a data correction for a single observer in 2010 who appeared to consistently underestimate distance (Stephens, Mohren, Newell et al. 2013) by doubling all of this observer’s detection distances before analysis, thereby making the 2010 Crater Lake results more comparable to other years. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	OR/WA PIF Eastslope ²	Cont PIF Northern Pacific Rainforest ^{3,4}	Cont PIF Great Basin ^{3,4}	ODFW West Cascades ⁴	ODFW East Cascades ⁴
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	0	0.005	0.007	0.002	0.017	0.143	–	–	–	W	–	–
Rufous Hummingbird	<i>Selasphorus rufus</i>	0.025	0.005	0.012	0.002	0.017	0.171	X	–	W	–	–	–
Pileated Woodpecker	<i>Dryocopus pileatus</i>	0.002	0.005	0.005	0.002	0.014	0.086	X	–	–	–	–	–
Cassin’s Vireo	<i>Vireo cassinii</i>	0.005	0	0	0.007	0.012	0.057	–	–	–	–	–	–
Downy Woodpecker	<i>Dryobates pubescens</i>	0	0	0	0.007	0.012	0.143	–	–	–	–	–	–
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	0.02	0.024	0.038	0.017	0.01	0.114	–	–	–	–	–	–
Bushtit	<i>Psaltirparus minimus</i>	0	0	0	0.005	0.005	0.029	–	–	–	–	–	–
Orange-crowned Warbler ⁵	<i>Leiothlypis celata</i>	0	0	0.002	0.002	0.005	0.057	X	–	–	–	–	–
Common Nighthawk	<i>Chordeiles minor</i>	0	0	0	0.002	0.005	0.057	–	–	D	D	–	–
Horned Lark	<i>Eremophila alpestris</i>	0.039	0	0	0.02	0.002	0.029	–	–	–	–	–	–
Tree Swallow	<i>Tachycineta bicolor</i>	0	0	0	0.01	0.002	0.029	–	–	–	–	–	–
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	0	0	0	0.007	0.002	0.029	–	–	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Oregon-Washington Partners in Flight habitat conservation plan for landbirds in the East Cascade Mountains (Altman and Stephens 2022).

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Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	OR/WA PIF Eastslope ²	Cont PIF Northern Pacific Rainforest ^{3,4}	Cont PIF Great Basin ^{3,4}	ODFW West Cascades ⁴	ODFW East Cascades ⁴
Varied Thrush	<i>Ixoreus naevius</i>	0	0.002	0.005	0.005	0.002	0.029	X	–	D	D	–	–
Western Wood-Pewee	<i>Contopus sordidulus</i>	0	0	0	0.002	0.007	0.086	–	X	–	–	–	–
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	0	0	0.002	0	0.005	0.029	–	–	W	–	–	–
Common Raven	<i>Corvus corax</i>	0	0	0.002	0	0.002	0.029	–	–	–	–	–	–
Hammond’s Flycatcher	<i>Empidonax hammondi</i>	0	0	0.005	0	0.01	0.057	X	–	–	–	–	–
Lesser Goldfinch	<i>Spinus psaltria</i>	0.103	0	0	0	0.007	0.029	–	–	–	–	–	–
MacGillivray’s Warbler ⁷	<i>Geothlypis tolmiei</i>	0	0	0.002	0	0.007	0.057	–	–	–	–	–	–
Black-capped Chickadee	<i>Poecile atricapillus</i>	0	0	0	0	0.002	0.086	X	–	–	–	–	–
Warbling Vireo	<i>Vireo gilvus</i>	0	0	0	0	0.002	0.057	X	–	–	–	–	–
Purple Finch	<i>Haemorhous purpureus</i>	0	0	0	0	0.002	0.029	–	–	–	–	–	–
Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	0	0	0	0	0.002	0.029	–	–	–	–	–	–
American Crow	<i>Corvus brachyrhynchos</i>	0	0	0	0	0.002	0.029	–	–	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Oregon-Washington Partners in Flight habitat conservation plan for landbirds in the East Cascade Mountains (Altman and Stephens 2022).

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Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	OR/WA PIF Eastslope ²	Cont PIF Northern Pacific Rainforest ^{3,4}	Cont PIF Great Basin ^{3,4}	ODFW West Cascades ⁴	ODFW East Cascades ⁴
White-breasted Nuthatch	<i>Sitta carolinensis</i>	0	0	0	0	0.002	0.029	–	–	–	–	–	–
Bullock’s Oriole	<i>Icterus bullockii</i>	0	0	0	0	0.002	0.029	X	–	–	–	–	–
Brewer’s Blackbird	<i>Euphagus cyanocephalus</i>	0	0	0	0	0.002	0.029	X	–	–	–	–	–
Nashville Warbler ⁵	<i>Leiothlypis ruficapilla</i>	0	0	0.005	0.042	0	0	X	X	–	–	–	–
Lincoln’s Sparrow	<i>Melospiza lincolnii</i>	0	0	0.007	0.012	0	0	X	–	–	–	–	–
Lazuli Bunting	<i>Passerina amoena</i>	0	0	0.007	0.007	0	0	–	–	–	–	–	–
Pacific Wren ⁷	<i>Troglodytes pacificus</i>	0.002	0.002	0.002	0.007	0	0	X	–	–	–	–	–
American Three-toed Woodpecker	<i>Picoides dorsalis</i>	0	0.005	0.031	0.005	0	0	–	–	–	–	–	X
House Finch	<i>Haemorhous mexicanus</i>	0.002	0	0	0.005	0	0	–	–	–	–	–	–
White-headed Woodpecker	<i>Dryobates albolarvatus</i>	0	0	0.005	0.005	0	0	–	X	–	–	–	X

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Oregon-Washington Partners in Flight habitat conservation plan for landbirds in the East Cascade Mountains (Altman and Stephens 2022).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

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Table 1 (continued). Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019 and 2022 point count surveys at Crater Lake National Park, and proportion of routes with detections for each species in 2022. We performed a data correction for a single observer in 2010 who appeared to consistently underestimate distance (Stephens, Mohren, Newell et al. 2013) by doubling all of this observer’s detection distances before analysis, thereby making the 2010 Crater Lake results more comparable to other years. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	OR/WA PIF Eastslope ²	Cont PIF Northern Pacific Rainforest ^{3,4}	Cont PIF Great Basin ^{3,4}	ODFW West Cascades ⁴	ODFW East Cascades ⁴
House Wren	<i>Troglodytes aedon</i>	0	0	0.002	0.002	0	0	–	–	–	–	–	–
Great Horned Owl	<i>Bubo virginianus</i>	0	0	0	0.002	0	0	–	–	–	–	–	–
Rock Wren	<i>Salpinctes obsoletus</i>	0	0	0	0.002	0	0	–	–	–	–	–	–
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	0	0	0	0.002	0	0	–	–	–	–	–	–
Fox Sparrow	<i>Passerella iliaca</i>	0	0	0.002	0	0	0	X	–	–	–	–	–
Gray-crowned Rosy-Finch	<i>Leucosticte tephrocotis</i>	0	0	0.007	0	0	0	–	–	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Oregon-Washington Partners in Flight habitat conservation plan for landbirds in the East Cascade Mountains (Altman and Stephens 2022).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

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⁶ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

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Table 2. List of additional species detected at Crater Lake National Park in 2022 (not counted within 50 m during variable circular plot point count surveys) and conservation status. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); W are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	OR/WA PIF Conifer ¹	OR/WA PIF Eastslope ²	Cont. PIF Northern Pacific Rainforest ³	Cont. PIF Great Basin ³	ODFW West Cascades ⁴	ODFW East Cascades ⁴
Anna’s Hummingbird	<i>Calypte anna</i>	–	–	–	–	–	–
Bald Eagle	<i>Haliaeetus leucocephalus</i>	–	–	–	–	–	–
Canyon Wren	<i>Catherpes mexicanus</i>	–	–	–	–	–	–
Great Horned Owl	<i>Bubo virginianus</i>	–	–	–	–	–	–
Lazuli Bunting	<i>Passerina amoena</i>	X	–	–	–	–	–
Lincoln’s Sparrow	<i>Melospiza lincolnii</i>	X	X	–	–	–	–
Mountain Quail	<i>Oreortyx pictus</i>	–	–	W	–	–	–
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	X	X.	–	–	–	–
Northern Pygmy-Owl	<i>Glaucidium gnoma</i>	–	–	–	–	–	–
Pacific Wren	<i>Troglodytes pacificus</i>	–	–	–	–	–	–
Spotted Towhee	<i>Pipilo maculatus</i>	–	–	–	–	–	–
Swainson’s Thrush	<i>Catharus ustulatus</i>	–	–	–	–	–	–
Vesper Sparrow	<i>Pooecetes gramineus</i>	X	–	–	–	–	–
Western Bluebird	<i>Sialia mexicana</i>	X	X	–	–	–	–
White-headed Woodpecker	<i>Dryobates albolarvatus</i>	X	X	–	–	–	X
White-throated Sparrow	<i>Zonotrichia albicollis</i>	–	–	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Oregon-Washington Partners in Flight habitat conservation plan for landbirds in the East Cascade Mountains (Altman and Stephens 2022).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁴ Oregon conservation strategy (ODFW 2016).

Lassen Volcanic National Park

In 2022 we surveyed 24 of 25 permanent point count survey routes at Lassen Volcanic National Park (Figure 6). This was the first year of surveys in the park following the Dixie Fire in 2021. Due to safety and logistical issues resulting from the fire, fewer than all 12 points were surveyed on some routes. One route, LV04, was deemed inaccessible due to safety concerns by park staff and was not surveyed. All survey routes were originally established with 12 survey stations, but during the initial year of protocol implementation, 3 points were dropped due to safety and time constraints (LV01 and LV19 have 11 and 10 stations respectively, all other routes have 12 stations). Surveys were completed from June 21st to July 10th by Hayleigh Johnson and Sarah Beres. The sampling frame at Lassen Volcanic National Park is riparian, including both streams and wetlands. Ninety-three species have been detected within 50 m of the stations during at least 1 of 5 survey years. The 2022 point count surveys recorded 72 species within 50 m of the stations (Table 3). Of those species, Violet-green Swallow, Purple Finch, Spotted Towhee, Brown-headed Cowbird, Vesper Sparrow, Black-throated Gray Warbler, White-throated Sparrow, Bewick's Wren, Northern Rough-winged Swallow, American Kestrel, Bushtit, Band-tailed Pigeon, and Hutton's Vireo were not detected within 50 m on point count surveys previously (Table 3). An additional 20 species were recorded outside of 50 m during point count surveys or encountered between bird surveys or during vegetation surveys and accounted for on species checklists (Table 4).

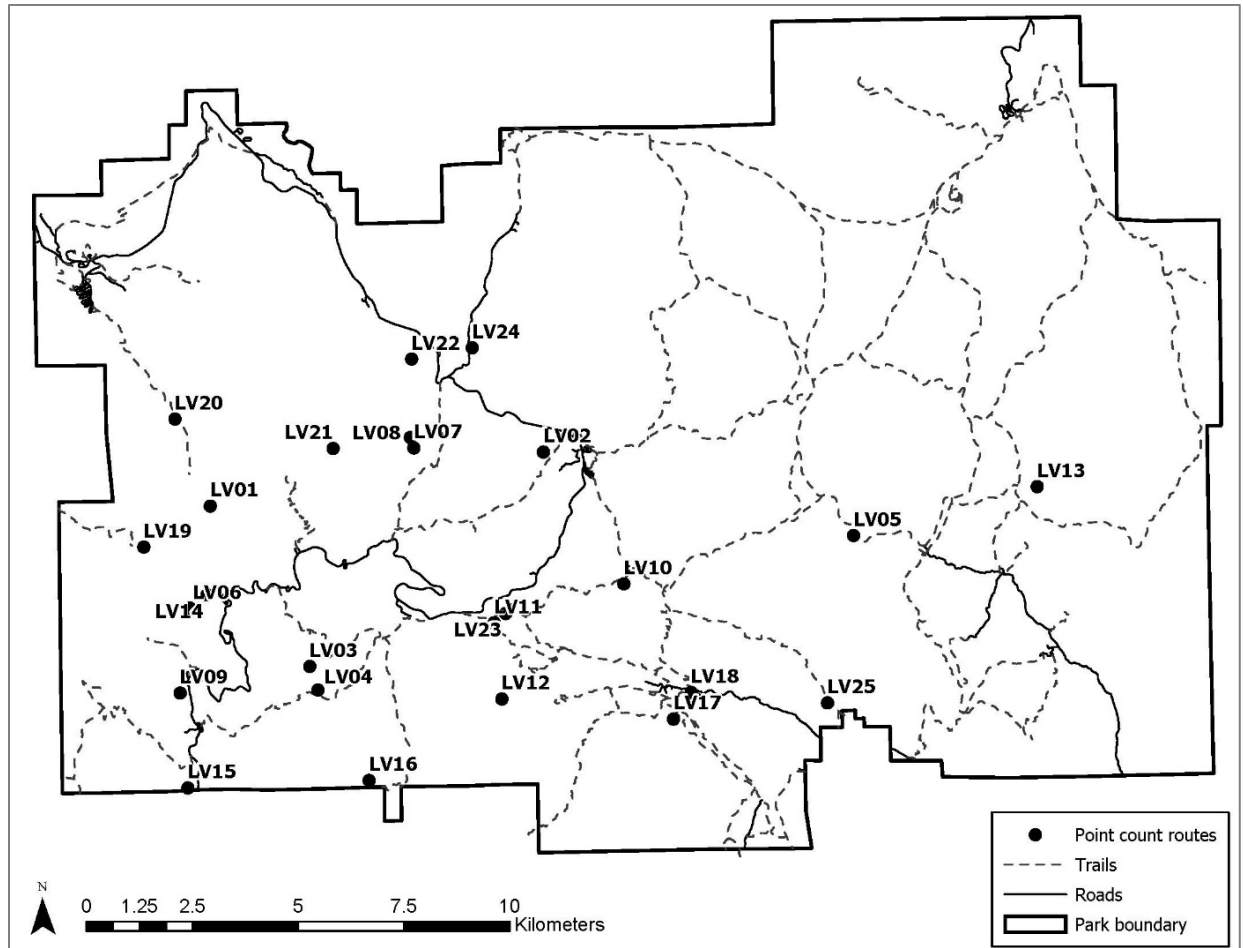


Figure 6. Point count routes at long-term landbird monitoring sites in Lassen Volcanic National Park.

Table 3. Mean relative abundance (RA) for bird species detected within 50 m/point during 2010, 2012, 2015, 2018, and 2022 point count surveys at Lassen Volcanic National Park, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Conifer ²	Continental PIF Pacific Birds ³	CDFW Cascades and Modoc Plateau ⁴
Dark-eyed Junco	<i>Junco hyemalis</i>	0.64	0.529	0.791	0.781	0.846	1	–	X	–	–
Yellow-rumped Warbler	<i>Setophaga coronata</i>	0.158	0.414	0.266	0.084	0.627	0.875	–	X	–	–
Mountain Chickadee	<i>Poecile gambeli</i>	0.212	0.212	0.162	0.205	0.495	0.958	–	–	–	–
American Robin	<i>Turdus migratorius</i>	0.242	0.263	0.226	0.168	0.28	0.875	–	–	–	–
Golden-crowned Kinglet	<i>Regulus satrapa</i>	0.216	0.253	0.215	0.283	0.272	0.583	–	X	–	–
Wilson’s Warbler	<i>Cardellina pusilla</i>	0.293	0.205	0.3	0.276	0.272	0.75	X	–	D	–
Western Tanager	<i>Piranga ludoviciana</i>	0.024	0.101	0.037	0.145	0.254	0.833	–	X	–	–
Western Wood-Pewee	<i>Contopus sordidulus</i>	0.074	0.125	0.121	0.108	0.244	0.875	–	–	–	–
Steller’s Jay	<i>Cyanocitta stelleri</i>	0.104	0.074	0.094	0.125	0.237	0.833	–	X	–	–
Warbling Vireo	<i>Vireo gilvus</i>	0.125	0.088	0.101	0.114	0.219	0.667	X	–	–	–
Lincoln’s Sparrow	<i>Melospiza lincolnii</i>	0.229	0.168	0.502	0.145	0.179	0.5	–	–	–	–
Pine Siskin	<i>Spinus pinus</i>	0.266	0.677	0.111	0.051	0.172	0.458	–	–	D	–
Song Sparrow	<i>Melospiza melodia</i>	0.044	0.027	0.057	0.071	0.165	0.458	X	–	–	–
Brown Creeper	<i>Certhia americana</i>	0.125	0.098	0.141	0.152	0.133	0.875	–	X	–	–
Cassin’s Finch	<i>Haemorhous cassinii</i>	0.094	0.145	0.091	0.061	0.118	0.542	–	X	–	–
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	0.017	0.114	0.152	0.155	0.111	0.333	–	–	–	–
MacGillivray’s Warbler	<i>Geothlypis tolmiei</i>	0.047	0.017	0.071	0.108	0.09	0.417	–	X	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).

² California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁴ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).

⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 3 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2010, 2012, 2015, 2018, and 2022 point count surveys at Lassen Volcanic National Park, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Conifer ²	Continental PIF Pacific Birds ³	CDFW Cascades and Modoc Plateau ⁴
Red-breasted Nuthatch	<i>Sitta canadensis</i>	0.047	0.061	0.236	0.067	0.086	0.417	–	X	–	–
Lazuli Bunting	<i>Passerina amoena</i>	0	0.013	0.104	0.03	0.086	0.292	–	–	–	–
Chipping Sparrow	<i>Spizella passerina</i>	0.02	0.01	0.088	0.02	0.086	0.375	–	X	–	–
Hairy Woodpecker	<i>Dryobates villosus</i>	0.02	0.013	0.044	0.027	0.079	0.542	–	–	–	–
Olive-sided Flycatcher	<i>Contopus cooperi</i>	0	0.024	0.02	0.02	0.079	0.458	–	X	W	X
Pacific-slope Flycatcher ⁵	<i>Empidonax difficilis</i>	0	0.007	0.003	0.027	0.072	0.417	–	–	–	–
American Dipper	<i>Cinclus mexicanus</i>	0.014	0.04	0.04	0.02	0.057	0.208	–	–	–	–
Northern Flicker	<i>Colaptes auratus</i>	0.003	0.01	0.01	0.007	0.057	0.458	–	–	–	–
Cassin’s Vireo	<i>Vireo cassinii</i>	0	0.003	0.034	0.003	0.047	0.417	–	–	–	–
Pacific Wren	<i>Troglodytes pacificus</i>	0.061	0.057	0.054	0.051	0.039	0.292	–	–	–	–
Green-tailed Towhee	<i>Pipilo chlorurus</i>	0.014	0.003	0.037	0.017	0.039	0.208	–	–	–	X
Tree Swallow	<i>Tachycineta bicolor</i>	0.017	0.013	0.024	0.04	0.036	0.042	X	–	–	–
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	0.014	0.061	0.084	0.024	0.025	0.25	–	–	–	–
House Wren	<i>Troglodytes aedon</i>	0.003	0.01	0.084	0.01	0.025	0.167	–	–	–	–
Rufous Hummingbird	<i>Selasphorus rufus</i>	0.051	0.017	0.232	0.064	0.022	0.25	–	–	W	–
Hermit Warbler	<i>Setophaga occidentalis</i>	0.007	0.01	0.017	0.017	0.022	0.208	–	–	–	–
Clark’s Nutcracker	<i>Nucifraga columbiana</i>	0.007	0	0	0.013	0.022	0.125	–	X	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).

² California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁴ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).

⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 3 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2010, 2012, 2015, 2018, and 2022 point count surveys at Lassen Volcanic National Park, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Conifer ²	Continental PIF Pacific Birds ³	CDFW Cascades and Modoc Plateau ⁴
Fox Sparrow	<i>Passerella iliaca</i>	0.014	0.024	0.013	0.01	0.022	0.167	–	X	–	–
White-headed Woodpecker	<i>Dryobates albolarvatus</i>	0.017	0.013	0.024	0.01	0.022	0.125	–	–	–	–
Violet-green Swallow	<i>Tachycineta thalassina</i>	0	0	0	0	0.022	0.083	–	–	–	–
Black-backed Woodpecker	<i>Picoides arcticus</i>	0.003	0.003	0.04	0.03	0.018	0.167	–	X	–	–
Pileated Woodpecker	<i>Dryocopus pileatus</i>	0	0	0	0.003	0.018	0.167	–	X	–	–
Hermit Thrush	<i>Catharus guttatus</i>	0	0	0.003	0	0.018	0.083	–	–	–	–
Purple Finch	<i>Haemorhous purpureus</i>	0	0	0	0	0.018	0.167	–	–	–	–
Spotted Towhee	<i>Pipilo maculatus</i>	0	0	0	0	0.018	0.167	–	–	–	–
Yellow Warbler	<i>Setophaga petechia</i>	0.007	0	0.01	0.007	0.014	0.125	X	–	–	X
Downy Woodpecker	<i>Dryobates pubescens</i>	0	0	0.01	0	0.014	0.083	–	–	–	–
Brown-headed Cowbird	<i>Molothrus ater</i>	0	0	0	0	0.014	0.125	–	–	–	–
Spotted Sandpiper	<i>Actitis macularius</i>	0.027	0	0.003	0.027	0.011	0.083	X	–	–	–
Swainson’s Thrush	<i>Catharus ustulatus</i>	0	0.01	0.007	0.02	0.011	0.125	X	–	–	–
Calliope Hummingbird	<i>Selasphorus calliope</i>	0.003	0.017	0.003	0.007	0.011	0.125	–	–	–	–
Common Raven	<i>Corvus corax</i>	0	0	0	0.003	0.011	0.083	–	–	–	–
Vesper Sparrow	<i>Pooecetes gramineus</i>	0	0	0	0	0.011	0.125	–	–	–	–
Evening Grosbeak	<i>Cocco-thraustes vespertinus</i>	0.017	0.098	0.027	0.03	0.007	0.042	–	–	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).

² California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁴ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).

⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 3 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2010, 2012, 2015, 2018, and 2022 point count surveys at Lassen Volcanic National Park, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Conifer ²	Continental PIF Pacific Birds ³	CDFW Cascades and Modoc Plateau ⁴
Orange-crowned Warbler	<i>Leiothlypis celata</i>	0.04	0.061	0.081	0.024	0.007	0.083	–	–	–	–
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	0	0	0.017	0.01	0.007	0.083	X	–	–	–
Sooty Grouse	<i>Dendragapus fuliginosus</i>	0.007	0.007	0.027	0.01	0.007	0.083	–	–	W	X
Townsend’s Solitaire	<i>Myadestes townsendi</i>	0.003	0.034	0.02	0.007	0.007	0.083	–	–	–	–
Dusky Flycatcher	<i>Empidonax oberholseri</i>	0.003	0.007	0	0.003	0.007	0.083	–	–	–	–
Anna’s Hummingbird	<i>Calypte anna</i>	0	0.007	0.003	0	0.007	0.083	–	–	–	–
Hammond’s Flycatcher	<i>Empidonax hammondii</i>	0.003	0.003	0.013	0	0.007	0.083	–	–	–	–
Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	0	0	0	0	0.007	0.083	–	X	–	–
White-throated Sparrow	<i>Zonotrichia albicollis</i>	0	0	0	0	0.007	0.042	–	–	–	–
Bewick’s Wren	<i>Thryomanes bewickii</i>	0	0	0	0	0.007	0.042	–	–	–	–
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	0	0	0	0	0.007	0.042	–	–	–	–
American Kestrel	<i>Falco sparverius</i>	0	0	0	0	0.007	0.042	–	–	–	–
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	0.01	0.013	0.027	0.017	0.004	0.042	–	–	–	–
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	0.003	0.01	0.007	0.007	0.004	0.042	–	–	–	–
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	0.003	0	0.007	0.003	0.004	0.042	–	–	–	–
Wilson’s Snipe	<i>Gallinago delicata</i>	0.003	0	0	0.003	0.004	0.042	–	–	–	–
Cordilleran Flycatcher ⁵	<i>Empidonax occidentalis</i>	0	0.007	0.01	0	0.004	0.042	–	–	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).

² California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁴ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).

⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 3 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2010, 2012, 2015, 2018, and 2022 point count surveys at Lassen Volcanic National Park, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Conifer ²	Continental PIF Pacific Birds ³	CDFW Cascades and Modoc Plateau ⁴
Mountain Quail	<i>Oreortyx pictus</i>	0.024	0.007	0.047	0	0.004	0.042	–	X	W	–
Bushtit	<i>Psaltirparus minimus</i>	0	0	0	0	0.004	0.042	–	–	–	–
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	0	0	0	0	0.004	0.042	–	–	W	–
Hutton’s Vireo	<i>Vireo huttoni</i>	0	0	0	0	0.004	0.042	–	–	–	–
Brewer’s Blackbird	<i>Euphagus cyanoceph-alus</i>	0	0	0	0.007	0	0	–	–	–	–
Red Crossbill	<i>Loxia curvirostra</i>	0	0.024	0.007	0.007	0	0	–	–	–	–
Western Bluebird	<i>Sialia mexicana</i>	0	0.003	0	0.003	0	0	–	–	–	–
White-breasted Nuthatch	<i>Sitta carolinensis</i>	0.007	0	0.013	0.003	0	0	–	–	–	–
Barn Swallow	<i>Hirundo rustica</i>	0.003	0.013	0	0	0	0	–	–	–	–
Belted Kingfisher	<i>Megaceryle alcyon</i>	0	0	0.003	0	0	0	–	–	–	–
Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>	0	0	0.003	0	0	0	–	–	–	–
Canada Goose	<i>Branta canadensis</i>	0.007	0	0	0	0	0	–	–	–	–
Cooper’s Hawk	<i>Accipiter cooperii</i>	0	0	0.003	0	0	0	–	–	–	–
Gray Flycatcher	<i>Empidonax wrightii</i>	0	0	0.003	0	0	0	–	–	–	X
Canada Jay	<i>Perisoreus canadensis</i>	0	0.017	0.01	0	0	0	–	X	–	–
Great Blue Heron	<i>Ardea herodias</i>	0	0	0.003	0	0	0	–	–	–	–
Great Horned Owl	<i>Bubo virginianus</i>	0	0	0.003	0	0	0	–	–	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).
² California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).
³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).
⁴ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).
⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 3 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2010, 2012, 2015, 2018, and 2022 point count surveys at Lassen Volcanic National Park, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Conifer ²	Continental PIF Pacific Birds ³	CDFW Cascades and Modoc Plateau ⁴
Killdeer	<i>Charadrius vociferous</i>	0	0.003	0	0	0	0	–	–	–	–
Lesser Goldfinch	<i>Spinus psaltria</i>	0	0.003	0	0	0	0	–	–	–	–
Mountain Bluebird	<i>Sialia currucoides</i>	0.007	0.017	0.003	0	0	0	–	–	–	–
Northern Goshawk	<i>Accipiter atricapillus</i>	0	0	0.007	0	0	0	–	–	–	X
Rock Wren	<i>Salpinctes obsoletus</i>	0.003	0	0.003	0	0	0	–	–	–	–
Varied Thrush	<i>Ixoreus naevius</i>	0.003	0	0	0	0	0	–	–	D	–
Vaux’s Swift	<i>Chaetura vauxi</i>	0	0.003	0	0	0	0	–	X	–	X
Williamson’s Sapsucker	<i>Sphyrapicus thyroideus</i>	0	0.003	0.007	0	0	0	–	–	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).
² California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).
³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).
⁴ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).
⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 4. List of additional species detected at Lassen Volcanic National Park in 2022 (not counted within 50 m during variable circular plot point count surveys), and their associated conservation or observation status according to other entities. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Habitat Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	CalPIF Riparian ¹	CalPIF Conifer ²	Continental PIF Pacific Birds ³	CDFW Cascades and Modoc Plateau ⁴
American Crow	<i>Corvus brachyrhynchos</i>	–	–	–	–
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	–	–	–	–
Bald Eagle	<i>Haliaeetus leucocephalus</i>	–	–	–	X
Bank Swallow	<i>Riparia riparia</i>	X	–	D	–
Bullock’s Oriole	<i>Icterus bullockii</i>	–	–	–	–
Canada Goose	<i>Branta canadensis</i>	–	–	–	–
Canada Jay	<i>Perisoreus canadensis</i>	–	X	–	–
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	–	–	–	–
Gray Flycatcher	<i>Empidonax wrightii</i>	–	X	–	X
Lark Sparrow	<i>Chondestes grammacus</i>	–	–	–	X
Mallard	<i>Anas platyrhynchos</i>	–	–	–	–
Red Crossbill	<i>Loxia curvirostra</i>	–	–	–	–
Red-tailed Hawk	<i>Buteo jamaicensis</i>	–	–	–	–
Rock Wren	<i>Salpinctes obsoletus</i>	–	–	–	–
Sandhill Crane	<i>Antigone canadensis</i>	–	–	–	X
Turkey Vulture	<i>Cathartes aura</i>	–	–	–	–
Vaux’s Swift	<i>Chaetura vaux</i>	–	X	–	X
Western Bluebird	<i>Sialia mexicana</i>	–	–	–	–
Western Screech-Owl	<i>Megascops kennicottii</i>	–	–	–	–
White-breasted Nuthatch	<i>Sitta carolinensis</i>	–	–	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).

² California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).

³ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁴ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).

Whiskeytown National Recreation Area

In 2022, we surveyed all 30 of the 30 permanent point count survey routes at Whiskeytown National Recreation Area (Figure 7). Surveys were completed from May 16th to June 7th by Will Harrod and Azita Roshani. The sampling frame at Whiskeytown National Recreation Area included all roads, trails, and power lines. One hundred seven species have been detected within 50 m of the stations during at least 1 of 5 survey years. The 2022 point count surveys recorded 87 species within 50 m of the station (Table 5). Of those species, American Kestrel, Bald Eagle, Bank Swallow, Cassin's Finch, Chipping Sparrow, Double-crested Cormorant, Green Heron, Mountain Bluebird, Northern Pygmy-Owl, Western Kingbird, Nuttall's Woodpecker, Rock Wren, and White-headed Woodpecker were not detected within 50 m on point count surveys in 2009, 2012, 2015, or 2018. An additional 17 species were detected outside of 50 m during point count surveys or encountered between bird surveys or during vegetation surveys and accounted for on species checklists (Table 6).

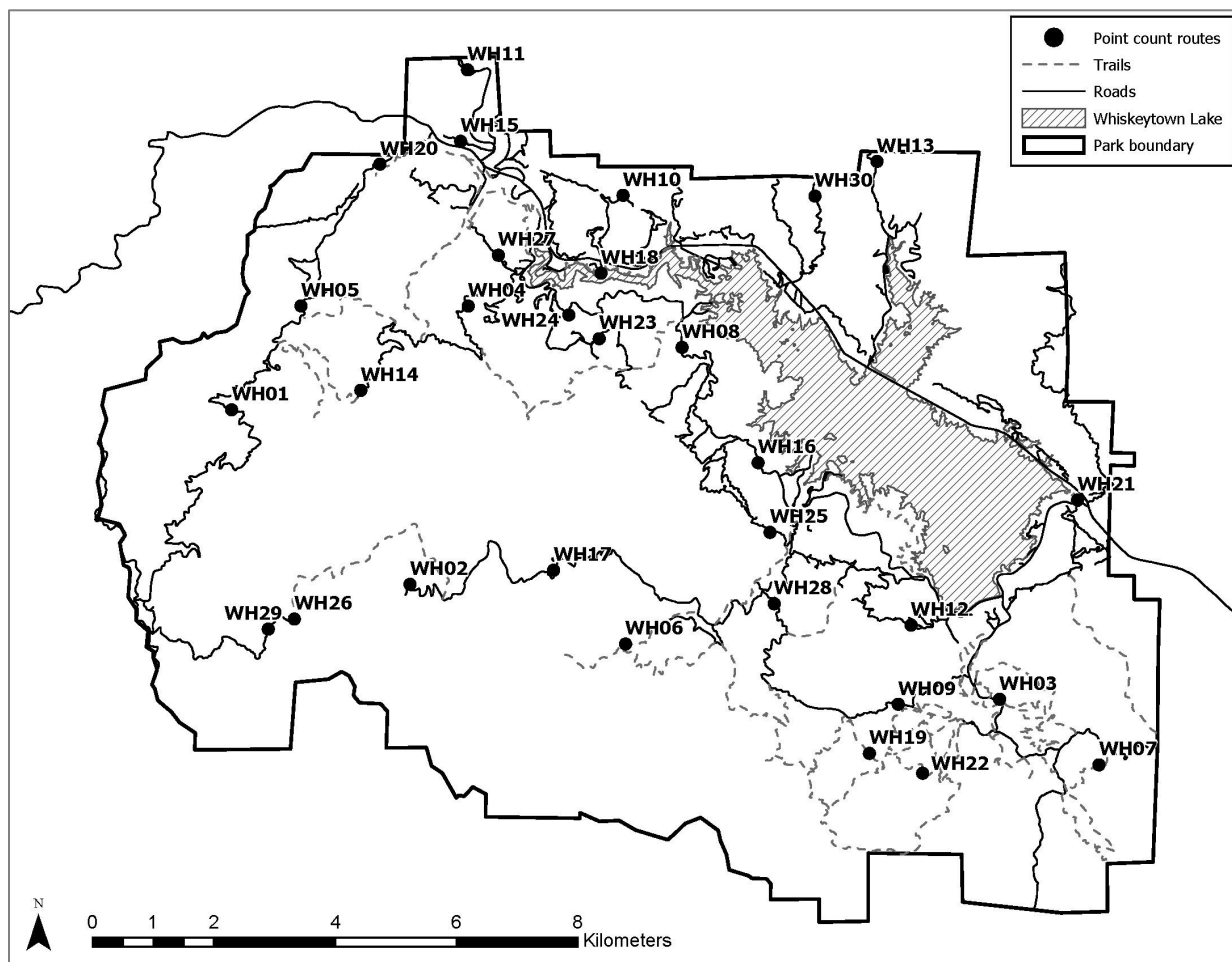


Figure 7. Point count routes at long-term landbird monitoring sites in Whiskeytown National Recreation Area.

Table 5. Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2009	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Spotted Towhee	<i>Pipilo maculatus</i>	0.225	0.422	0.411	0.399	0.56	0.967	–	–	–	–	X
Lesser Goldfinch	<i>Spinus psaltria</i>	0.183	0.307	0.095	0.132	0.56	0.867	–	–	–	–	–
Lazuli Bunting	<i>Passerina amoena</i>	0.042	0.026	0.024	0.029	0.48	0.8	–	–	–	–	–
Dark-eyed Junco	<i>Junco hyemalis</i>	0.15	0.141	0.196	0.224	0.325	0.8	–	–	X	–	–
Bewick’s Wren	<i>Thryomanes bewickii</i>	0.025	0.083	0.048	0.037	0.267	0.8	–	X	–	–	–
Orange-crowned Warbler	<i>Leiothlypis celata</i>	0.267	0.213	0.229	0.233	0.259	0.833	–	–	–	–	–
Bushtit	<i>Psaltiriparus minimus</i>	0.172	0.138	0.131	0.126	0.224	0.4	–	–	–	–	–
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	0.164	0.184	0.182	0.08	0.164	0.6	X	–	–	–	–
Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	0.439	0.284	0.336	0.244	0.144	0.467	–	–	X	–	–
Brown-headed Cowbird	<i>Molothrus ater</i>	0.106	0.132	0.068	0.092	0.144	0.7	–	–	–	–	–
Steller’s Jay	<i>Cyanocitta stelleri</i>	0.072	0.089	0.104	0.072	0.126	0.633	–	–	X	–	–
Anna’s Hummingbird	<i>Calypte anna</i>	0.086	0.06	0.012	0.124	0.115	0.667	–	–	–	–	–
House Wren	<i>Troglodytes aedon</i>	0.003	0.006	0	0.003	0.115	0.467	–	–	–	–	–
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	0.039	0.066	0.071	0.029	0.106	0.533	–	X	–	–	–
Western Tanager	<i>Piranga ludoviciana</i>	0.086	0.112	0.083	0.086	0.095	0.467	–	–	X	–	–
American Robin	<i>Turdus migratorius</i>	0.042	0.055	0.021	0.049	0.095	0.533	–	–	–	–	–

¹ California Partners in Flight riparian bird conservation plan (RHJV 2004).

² California Partners in Flight oak woodland bird conservation plan (CalPIF 2002b).

³ California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).

⁴ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁵ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).

⁶ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 5 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2009	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Cassin's Vireo	<i>Vireo cassinii</i>	0.15	0.069	0.086	0.089	0.089	0.333	–	–	–	–	–
Hairy Woodpecker	<i>Dryobates villosus</i>	0.031	0.049	0.042	0.026	0.089	0.467	–	–	–	–	–
Western Wood-Pewee	<i>Contopus sordidulus</i>	0.011	0.017	0.039	0.023	0.069	0.367	–	–	–	–	–
Yellow-breasted Chat	<i>Icteria virens</i>	0.014	0.011	0.003	0.017	0.066	0.433	X	–	–	–	–
California Scrub-Jay	<i>Aphelocoma californica</i>	0.042	0.046	0.065	0.046	0.063	0.333	–	X	–	–	–
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	0.039	0.052	0.033	0.049	0.06	0.4	–	X	–	–	–
Yellow-rumped Warbler	<i>Setophaga coronata</i>	0.042	0.075	0.033	0.057	0.052	0.333	–	–	X	–	–
Fox Sparrow	<i>Passerella iliaca</i>	0.036	0.109	0.039	0.046	0.049	0.067	–	–	X	–	–
Mourning Dove	<i>Zenaidura macroura</i>	0.036	0.043	0.015	0.011	0.049	0.4	–	–	–	–	–
Tree Swallow	<i>Tachycineta bicolor</i>	0.019	0.009	0	0.006	0.049	0.2	X	–	–	–	–
Downy Woodpecker	<i>Dryobates pubescens</i>	0	0.023	0.027	0	0.049	0.5	–	–	–	–	–
Wrentit	<i>Chamaea fasciata</i>	0.058	0.132	0.095	0.121	0.037	0.267	–	–	–	D	–
Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	0.103	0.098	0.113	0.101	0.034	0.267	–	X	–	–	–
Wilson's Warbler	<i>Cardellina pusilla</i>	0.186	0.06	0.08	0.078	0.034	0.2	X	–	–	D	–
Common Raven	<i>Corvus corax</i>	0.019	0.02	0.003	0.138	0.032	0.333	–	–	–	–	–
Purple Finch	<i>Carpodacus purpureus</i>	0.003	0.014	0.018	0.003	0.032	0.1	–	–	X	–	–

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² California Partners in Flight oak woodland bird conservation plan (CalPIF 2002b).

³ California Partners in Flight coniferous forest bird conservation plan (CalPIF 2002a).

⁴ Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

⁵ California Department of Fish and Wildlife action plan, 2015 update (CDFW 2015).

⁶ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 5 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2009	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Yellow Warbler	<i>Setophaga petechia</i>	0.072	0.063	0.057	0.023	0.026	0.1	X	–	–	–	X
Mountain Quail	<i>Oreortyx pictus</i>	0.003	0.057	0.033	0.017	0.026	0.267	–	–	X	W	–
MacGillivray’s Warbler	<i>Geothlypis tolmiei</i>	0.017	0.026	0.006	0.014	0.026	0.167	–	–	X	–	–
Northern Flicker	<i>Colaptes auratus</i>	0.017	0.023	0.015	0.011	0.026	0.2	–	–	–	–	–
California Towhee	<i>Melozona crissalis</i>	0.014	0.003	0	0	0.026	0.233	–	X	–	–	–
House Finch	<i>Haemorhous mexicanus</i>	0	0	0	0.026	0.023	0.133	–	–	–	–	–
Song Sparrow	<i>Melospiza melodia</i>	0.014	0.026	0.015	0.014	0.023	0.2	X	–	–	–	–
White-breasted Nuthatch	<i>Sitta carolinensis</i>	0	0.003	0.015	0.003	0.023	0.233	–	X	–	–	–
Oak Titmouse	<i>Baeolophus inornatus</i>	0.044	0.029	0.048	0.043	0.02	0.1	–	X	–	–	–
Brown Creeper	<i>Certhia americana</i>	0.008	0.011	0.009	0.026	0.02	0.167	–	–	X	–	–
Pacific-slope Flycatcher ⁶	<i>Empidonax difficilis</i>	0.056	0.095	0.057	0.04	0.017	0.1	–	–	–	–	–
Warbling Vireo	<i>Vireo gilvus</i>	0.067	0.06	0.051	0.02	0.017	0.2	X	–	–	–	–
Olive-sided Flycatcher	<i>Contopus cooperi</i>	0	0	0.003	0.014	0.017	0.067	–	–	X	W	X
Turkey Vulture	<i>Cathartes aura</i>	0.019	0.006	0	0.006	0.017	0.1	–	–	–	–	–
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	0	0	0	0.003	0.017	0.1	–	–	–	–	–

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Table 5 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2009	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Red-breasted Nuthatch	<i>Sitta canadensis</i>	0.053	0.032	0.092	0.069	0.014	0.133	–	–	X	–	–
Dusky Flycatcher	<i>Empidonax oberholseri</i>	0.028	0.037	0.018	0.023	0.014	0.133	–	–	–	–	–
California Quail	<i>Callipepla californica</i>	0.014	0.02	0.012	0.009	0.014	0.133	–	X	–	–	X
Brewer’s Blackbird	<i>Euphagus cyanocephalus</i>	0.006	0.003	0.003	0.006	0.014	0.1	–	–	–	–	–
Bullock’s Oriole	<i>Icterus bullockii</i>	0.019	0.006	0.009	0.006	0.014	0.067	–	–	–	–	–
Pine Siskin	<i>Spinus pinus</i>	0	0	0.009	0	0.014	0.1	–	–	–	D	–
Mountain Chickadee	<i>Poecile gambeli</i>	0.025	0.014	0.015	0.017	0.011	0.1	–	–	–	–	–
Western Bluebird	<i>Sialia mexicana</i>	0	0	0	0.006	0.011	0.1	–	X	–	–	–
Chipping Sparrow	<i>Spizella passerina</i>	0	0	0	0	0.011	0.1	–	–	X	–	–
Double-crested Cormorant	<i>Nannopterum auritum</i>	0	0	0	0	0.011	0.033	–	–	–	–	–
Nuttall’s Woodpecker	<i>Dryobates nuttallii</i>	0	0	0	0	0.011	0.067	–	–	–	–	–
Hutton’s Vireo	<i>Vireo huttoni</i>	0.058	0.112	0.11	0.08	0.009	0.1	–	X	–	–	X
Hermit Warbler	<i>Setophaga occidentalis</i>	0.028	0.003	0	0.009	0.009	0.1	–	–	–	–	–
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	0.011	0.017	0.018	0.003	0.009	0.033	–	–	–	–	–
Black Phoebe	<i>Sayornis nigricans</i>	0.006	0	0.003	0	0.009	0.1	–	–	–	–	–
Rufous Hummingbird	<i>Selasphorus rufus</i>	0.006	0.009	0.006	0	0.009	0.1	–	–	–	W	–

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Table 5 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2009	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Violet-green Swallow	<i>Tachycineta thalassina</i>	0.011	0.003	0	0	0.009	0.033	–	–	–	–	–
American Kestrel	<i>Falco sparverius</i>	0	0	0	0	0.009	0.067	–	–	–	–	–
Killdeer	<i>Charadrius vociferous</i>	0	0	0	0.006	0.006	0.033	–	–	–	–	–
Osprey	<i>Pandion haliaetus</i>	0	0	0.009	0.006	0.006	0.067	–	–	–	–	X
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	0.003	0.009	0.009	0.006	0.006	0.033	–	–	–	–	–
Hermit Thrush	<i>Catharus guttatus</i>	0	0.003	0	0.003	0.006	0.067	–	–	–	–	–
American Goldfinch	<i>Spinus tristis</i>	0.008	0	0	0	0.006	0.067	–	–	–	–	–
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	0.003	0.003	0	0	0.006	0.067	–	–	–	W	–
Lark Sparrow	<i>Chondestes grammacus</i>	0	0.003	0	0	0.006	0.067	–	X	–	–	–
Bank Swallow	<i>Riparia riparia</i>	0	0	0	0	0.006	0.033	X	–	–	D	–
Northern Pygmy-Owl	<i>Glaucidium gnoma</i>	0	0	0	0	0.006	0.067	–	X	–	–	–
Rock Wren	<i>Salpinctes obsoletus</i>	0	0	0	0	0.006	0.033	–	–	–	–	–
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	0.006	0.011	0.015	0.152	0.003	0.033	–	X	–	W	–
Mallard	<i>Anas platyrhynchos</i>	0	0	0.003	0.003	0.003	0.033	–	–	–	–	–
American Crow	<i>Corvus brachyrhynchos</i>	0	0	0.003	0	0.003	0.033	–	–	–	–	–
Barn Swallow	<i>Hirundo rustica</i>	0.025	0.006	0	0	0.003	0.033	–	–	–	–	–

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Table 5 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2009	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Hammond's Flycatcher	<i>Empidonax hammondi</i>	0.003	0.003	0	0	0.003	0.033	–	–	–	–	–
Red-tailed Hawk	<i>Buteo jamaicensis</i>	0	0.003	0	0	0.003	0.033	–	–	–	–	–
Bald Eagle	<i>Haliaeetus leucocephalus</i>	0	0	0	0	0.003	0.033	–	–	–	–	X
Cassin's Finch	<i>Haemorhous cassinii</i>	0	0	0	0	0.003	0.033	–	–	X	–	–
Green Heron	<i>Butorides virescens</i>	0	0	0	0	0.003	0.033	–	–	–	–	–
Mountain Bluebird	<i>Sialia currucoides</i>	0	0	0	0	0.003	0.033	–	–	–	–	–
Western Kingbird	<i>Tyrannus verticalis</i>	0	0	0	0	0.003	0.033	–	–	–	–	–
White-headed Woodpecker	<i>Dryobates albolarvatus</i>	0	0	0	0	0.003	0.033	–	–	–	–	–
Townsend's Warbler	<i>Setophaga townsendi</i>	0.078	0.006	0.018	0.057	0	0	–	–	–	–	–
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	0.047	0.04	0.009	0.026	0	0	–	–	–	–	–
Canada Goose	<i>Branta canadensis</i>	0.008	0	0	0.023	0	0	–	–	–	–	–
Pacific Wren	<i>Troglodytes pacificus</i>	0.003	0.014	0.021	0.011	0	0	–	–	–	–	–
European Starling	<i>Sturnus vulgaris</i>	0.006	0.006	0	0.006	0	0	–	–	–	–	–
Golden-crowned Kinglet	<i>Regulus satrapa</i>	0	0	0	0.006	0	0	–	–	X	–	–
Pileated Woodpecker	<i>Dryocopus pileatus</i>	0	0	0.003	0.006	0	0	–	–	X	–	X
Calliope Hummingbird	<i>Selasphorus calliope</i>	0	0	0	0.003	0	0	–	–	–	–	–

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Table 5 (continued). Mean relative abundance (RA) for bird species detected within 50 m/point during 2009, 2012, 2015, 2018, and 2022 point count surveys at Whiskeytown National Recreation Area, and proportion of routes with detections for each species in 2022. Species are listed in decreasing order of abundance for 2022 at the park; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2009	RA 2012	RA 2015	RA 2018	RA 2022	Proportion of Routes 2022	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Cedar Waxwing	<i>Bombycilla cedrorum</i>	0.003	0.103	0	0.003	0	0	–	–	–	–	–
Townsend's Solitaire	<i>Myadestes townsendi</i>	0.006	0.006	0	0.003	0	0	–	–	–	–	–
American Dipper	<i>Cinclus mexicanus</i>	0	0	0.003	0	0	0	–	–	–	–	–
Belted Kingfisher	<i>Megaceryle alcyon</i>	0	0	0.006	0	0	0	–	–	–	–	–
Black-capped Chickadee	<i>Poecile atricapillus</i>	0.008	0	0	0	0	0	–	–	–	–	–
Black-chinned Hummingbird	<i>Archilochus alexandri</i>	0	0.003	0.003	0	0	0	–	–	–	–	–
California Thrasher	<i>Toxostoma redivivum</i>	0	0.003	0	0	0	0	–	X	–	–	–
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	0.389	0.445	0	0	0	0	–	–	–	–	–
Common Merganser	<i>Mergus merganser</i>	0	0.029	0.006	0	0	0	–	–	–	–	–
Great Blue Heron	<i>Ardea herodias</i>	0.003	0.003	0	0	0	0	–	–	–	–	X
Green-tailed Towhee	<i>Pipilo chlorurus</i>	0	0	0.006	0	0	0	–	–	–	–	–
Spotted Sandpiper	<i>Actitis macularius</i>	0	0	0.003	0	0	0	X	–	–	–	–

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Table 6. List of additional species detected at Whiskeytown National Recreation Area in 2022 (not counted within 50 m during variable circular plot point count surveys) and conservation status. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Birds in Decline’ for the Pacific Birds Habitat Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	CalPIF Riparian ¹	CalPIF Oak ²	CalPIF Conifer ³	Continental PIF Pacific Birds ⁴	CDFW N. Coast and Klamath Province ⁵
Belted Kingfisher	<i>Megaceryle alcyon</i>	–	–	–	–	–
Calliope Hummingbird	<i>Selasphorus calliope</i>	–	–	–	–	–
Canada Goose	<i>Branta canadensis</i>	–	–	–	–	X
Canyon Wren	<i>Catherpes mexicanus</i>	–	–	–	–	–
Cedar Waxwing	<i>Bombycilla cedrorum</i>	–	–	–	–	–
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	–	–	–	–	–
Common Merganser	<i>Mergus merganser</i>	–	–	–	–	–
Common Yellowthroat	<i>Geothlypis trichas</i>	X	–	–	–	X
Great Blue Heron	<i>Ardea herodias</i>	–	–	–	–	–
Oak Titmouse	<i>Baeolophus inornatus</i>	–	X	–	–	–
Peregrine Falcon	<i>Falco peregrinus</i>	–	–	–	–	X
Pileated Woodpecker	<i>Dryocopus pileatus</i>	–	–	X	–	X
Red-shouldered Hawk	<i>Buteo lineatus</i>	–	X	–	–	–
Rock Pigeon	<i>Columba livia</i>	–	–	–	–	–
Sooty Grouse	<i>Dendragapus fuliginosus</i>	–	–	–	W	X
Townsend's Warbler	<i>Setophaga townsendi</i>	–	–	–	–	–
Wild Turkey	<i>Meleagris gallopavo</i>	–	X	–	–	–

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Oregon Caves National Monument and Preserve

In 2022 we surveyed 4 permanent point count survey routes at Oregon Caves National Monument and Preserve, each consisting of 12 survey stations (Figure 8). The sampling frame at Oregon Caves National Monument and Preserve included matrix areas (i.e., all non-high elevation and non-riparian areas). Surveys were completed from June 13th to June 17th by Sarah Beres. Fifty-six species have been detected within 50 m of the stations during at least 1 of 5 survey years, and a total of 14 species have been detected throughout all 5 years of surveys. The 2022 point count surveys recorded 39 species within 50 m of the stations (Table 7). An additional 33 species were detected outside of 50 m during point count surveys or encountered between bird surveys or during vegetation surveys and accounted for on species checklists (Table 8). Species detected during Oregon Caves point counts for the first time in 2022 include Anna's Hummingbird, Cassin's Vireo, California Towhee, Common Raven, Downy Woodpecker, House Wren, Townsend's Warbler, and Wilson's Warbler.

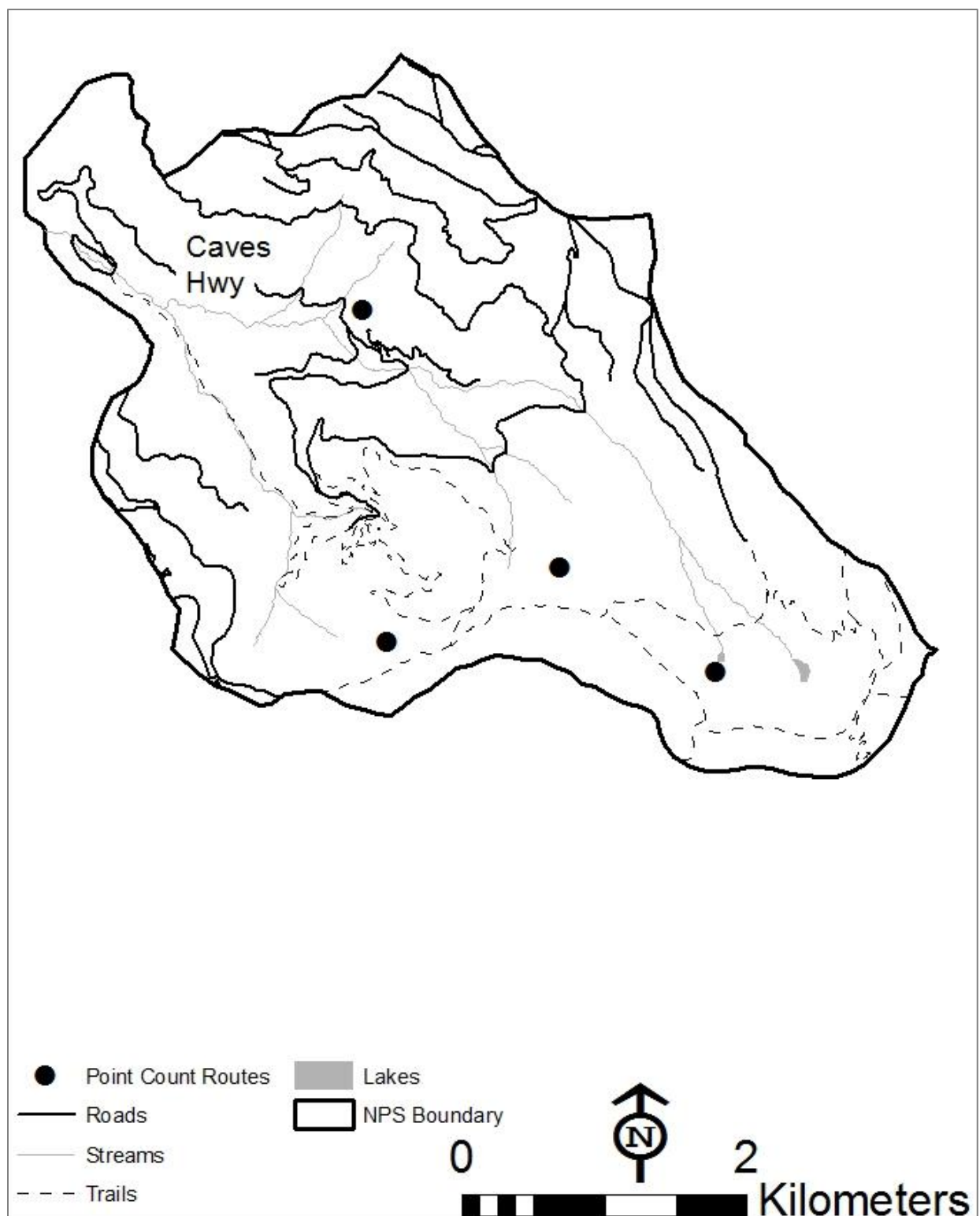


Figure 8. Point count routes at long-term landbird monitoring sites in Oregon Caves National Monument and Preserve.

Table 7. Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019, and 2022 point count surveys at Oregon Caves National Monument and Preserve, and proportion of routes with detections for each species in 2022. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	Cont. PIF Northern Pacific Rainforest ²	Cont. PIF Great Basin ²	ODFW Klamath Mountains ³
Hermit Warbler	<i>Setophaga occidentalis</i>	0.229	0.438	0.146	0.667	0.58	1	–	–	–	–
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	0	0.292	0.188	0.979	0.44	1	X	–	–	–
Red-breasted Nuthatch	<i>Sitta canadensis</i>	0.188	0.271	0.083	0.229	0.36	1	–	–	–	–
Dark-eyed Junco	<i>Junco hyemalis</i>	0.25	0	0.208	0.729	0.32	0.75	–	–	–	–
Yellow-rumped Warbler	<i>Setophaga coronata</i>	0.229	0.167	0.083	0.25	0.26	0.75	–	–	–	–
Mountain Chickadee	<i>Poecile gambeli</i>	0.042	0.104	0	0.021	0.22	0.5	–	–	–	–
Steller's Jay	<i>Cyanocitta stelleri</i>	0.104	0.104	0.063	0.292	0.2	0.75	–	–	–	–
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	0.188	0.271	0.083	0.333	0.18	0.75	–	W	–	–
Hammond's Flycatcher	<i>Empidonax hammondii</i>	0	0.167	0	0.104	0.16	0.25	X	–	–	–
Townsend's Warbler	<i>Setophaga townsendi</i>	0	0	0	0	0.16	0.25	X	–	–	–
Hermit Thrush	<i>Catharus guttatus</i>	0.063	0.125	0.042	0.208	0.14	0.5	X	–	–	–
Warbling Vireo	<i>Vireo gilvus</i>	0	0.063	0.021	0.083	0.14	0.25	–	–	–	–
Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	0.167	0	0	0	0.14	0.5	–	–	–	–
Golden-crowned Kinglet	<i>Regulus satrapa</i>	0.292	0.375	0.104	0.979	0.12	0.5	–	–	–	–
Pacific Wren ⁴	<i>Troglodytes pacificus</i>	0.021	0.021	0.063	0.021	0.1	0.75	X	–	–	–
Pacific-slope Flycatcher ⁵	<i>Empidonax difficilis</i>	0.042	0.25	0.021	0.167	0.08	0.5	X	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

³ Oregon conservation strategy (ODFW 2016).

⁴ Previously grouped with eastern North American and Eurasian species as the Winter Wren, *Troglodytes* (Chesser et al. 2011).

⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

⁶ Classification of Parulidae species has been revised based on recent genetic work (Chesser et al. 2011).

Table 7 (continued). Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019, and 2022 point count surveys at Oregon Caves National Monument and Preserve, and proportion of routes with detections for each species in 2022. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	Cont. PIF Northern Pacific Rainforest ²	Cont. PIF Great Basin ²	ODFW Klamath Mountains ³
Western Wood-Pewee	<i>Contopus sordidulus</i>	0	0.042	0	0.104	0.06	0.75	–	–	–	–
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	0	0.063	0.021	0.063	0.06	0.25	–	–	–	–
Western Tanager	<i>Piranga ludoviciana</i>	0	0	0	0.063	0.06	0.5	X	–	–	–
Green-tailed Towhee	<i>Pipilo chlorurus</i>	0	0.042	0.021	0	0.06	0.25	–	–	–	–
Olive-sided Flycatcher	<i>Contopus cooperi</i>	0	0.021	0	0	0.06	0.25	X	–	–	–
Wilson’s Warbler	<i>Cardellina pusilla</i>	0	0	0	0	0.06	0.25	–	D	–	–
MacGillivray’s Warbler ⁶	<i>Geothlypis tolmiei</i>	0.021	0.042	0.021	0.458	0.04	0.25	–	–	–	–
Fox Sparrow	<i>Passerella iliaca</i>	0.104	0.063	0.021	0.167	0.04	0.25	X	–	–	–
Chipping Sparrow	<i>Spizella passerina</i>	0	0.021	0	0.021	0.04	0.25	–	–	–	–
Northern Flicker	<i>Colaptes auratus</i>	0.021	0	0	0	0.04	0.5	X	–	–	–
Purple Finch	<i>Carpodacus purpureus</i>	0	0.021	0	0	0.04	0.25	X	–	–	–
Brown Creeper	<i>Certhia americana</i>	0.104	0.188	0.021	0.146	0.02	0.25	X	–	–	–
Hutton’s Vireo	<i>Vireo huttoni</i>	0	0	0	0.083	0.02	0.25	–	–	–	–
American Robin	<i>Turdus migratorius</i>	0.021	0.125	0.021	0.063	0.02	0.25	–	–	–	–
Canada Jay	<i>Perisoreus canadensis</i>	0.021	0.042	0.042	0.042	0.02	0.25	–	–	–	–
Mountain Quail	<i>Oreortyx pictus</i>	0.021	0	0.042	0.021	0.02	0.25	–	W	–	–

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Table 7 (continued). Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019, and 2022 point count surveys at Oregon Caves National Monument and Preserve, and proportion of routes with detections for each species in 2022. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	Cont. PIF Northern Pacific Rainforest ²	Cont. PIF Great Basin ²	ODFW Klamath Mountains ³
Pine Siskin	<i>Spinus pinus</i>	0.125	0.25	0	0	0.02	0.25	–	D	D	–
Anna’s Hummingbird	<i>Calypte anna</i>	0	0	0	0	0.02	0.25	–	–	–	–
Cassin’s Vireo	<i>Vireo cassinii</i>	0	0	0	0	0.02	0.25	X	–	–	–
California Towhee	<i>Melozone crissalis</i>	0	0	0	0	0.02	0.25	–	–	–	–
Common Raven	<i>Corvus corax</i>	0	0	0	0	0.02	0.25	X	–	–	–
Downy Woodpecker	<i>Dryobates pubescens</i>	0	0	0	0	0.02	0.25	–	–	–	–
House Wren	<i>Troglodytes aedon</i>	0	0	0	0	0.02	0.25	X	–	–	–
Lazuli Bunting	<i>Passerina amoena</i>	0	0.146	0	0.292	0	0	X	–	–	–
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	0.042	0.104	0.042	0.146	0	0	–	–	–	–
Dusky Flycatcher	<i>Empidonax oberholseri</i>	0.063	0.083	0.042	0.125	0	0	–	–	–	–
Bushtit	<i>Psaltriparus minimus</i>	0	0.021	0.021	0.083	0	0	–	–	–	–
Hairy Woodpecker	<i>Dryobates villosus</i>	0.042	0.063	0	0.063	0	0	–	–	–	–
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	0	0	0	0.042	0	0	–	–	–	X
Swainson’s Thrush	<i>Catharus ustulatus</i>	0	0	0	0.042	0	0	–	–	–	–
Orange-crowned Warbler	<i>Vermivora celata</i>	0	0	0.021	0.021	0	0	–	–	–	–
Red Crossbill	<i>Loxia curvirostra</i>	0.083	0.021	0	0.021	0	0	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).
² Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).
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⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.
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Table 7 (continued). Mean relative abundance (RA, birds within 50 m/point) for species detected during 2010, 2013, 2016, 2019, and 2022 point count surveys at Oregon Caves National Monument and Preserve, and proportion of routes with detections for each species in 2022. Species are ordered in decreasing order of abundance for 2022 at the park unit; those detected in previous years, but not in 2022, are listed at the end of the table. Conservation information available from selected plans is identified in rightmost columns. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	RA 2010	RA 2013	RA 2016	RA 2019	RA 2022	Proportion of Routes 2022	OR/WA PIF Conifer ¹	Cont. PIF Northern Pacific Rainforest ²	Cont. PIF Great Basin ²	ODFW Klamath Mountains ³
Townsend's Solitaire	<i>Myadestes townsendi</i>	0	0	0	0.021	0	0	–	–	–	–
Varied Thrush	<i>Ixoreus naevius</i>	0	0.104	0	0.021	0	0	X	D	D	–
White-headed Woodpecker	<i>Dryobates albolarvatus</i>	0	0	0	0.021	0	0	–	–	–	–
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	0.042	0.021	0.021	0	0	0	X	–	–	–
Pileated Woodpecker	<i>Dryocopus pileatus</i>	0.021	0	0	0	0	0	X	–	–	–
Rufous Hummingbird	<i>Selasphorus rufus</i>	0.063	0.104	0.063	0	0	0	X	W	–	–
Sooty Grouse	<i>Dendragapus fuliginosus</i>	0.021	0.042	0	0	0	0	–	W	–	–
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	0	0	0.021	0	0	0	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

³ Oregon conservation strategy (ODFW 2016).

⁴ Previously grouped with eastern North American and Eurasian species as the Winter Wren, *Troglodytes* (Chesser et al. 2011).

⁵ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

⁶ Classification of Parulidae species has been revised based on recent genetic work (Chesser et al. 2011).

Table 8. List of additional species detected at Oregon Caves National Monument and Preserve in 2022 (not counted within 50 m during variable circular plot point count surveys) and conservation status. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	OR/WA PIF Conifer ¹	Cont. PIF Northern Pacific Rainforest ²	Cont. PIF Great Basin ²	ODFW Klamath Mountains ³
American Crow	<i>Corvus brachyrhynchos</i>	–	–	–	–
Bald Eagle	<i>Haliaeetus leucocephalus</i>	–	–	–	–
Band-tailed Pigeon	<i>Patagioenas fasciata</i>	–	W	–	–
Barred Owl	<i>Strix varia</i>	–	–	–	–
Cassin’s Vireo	<i>Vireo cassinii</i>	–	–	–	–
Cedar Waxwing	<i>Bombycilla cedrorum</i>	–	–	–	–
Clark’s Nutcracker	<i>Nucifraga columbiana</i>	X	–	–	–
Common Raven	<i>Corvus corax</i>	–	–	–	–
Dusky Flycatcher	<i>Empidonax oberholser</i>	X	–	–	–
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	X	–	W	–
Golden-crowned Kinglet	<i>Regulus satrapa</i>	–	–	–	–
Hairy Woodpecker	<i>Dryobates villosus</i>	–	–	–	–
Lazuli Bunting	<i>Passerina amoena</i>	X	–	–	–
Lincoln’s Sparrow	<i>Melospiza lincolnii</i>	X	–	–	–
Marsh Wren	<i>Cistothorus palustris</i>	–	–	–	–
Northern Flicker	<i>Colaptes auratus</i>	X	–	–	–
Northern Pygmy-Owl	<i>Glaucidium gnoma</i>	–	–	–	–
Olive-sided Flycatcher	<i>Contopus cooperi</i>	–	–	W	–
Orange-crowned Warbler	<i>Leiothlypis celata</i>	–	–	–	–
Pileated Woodpecker	<i>Dryocopus pileatus</i>	–	–	–	–

¹ Oregon-Washington Partners in Flight habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012).

² Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

³ Oregon conservation strategy (ODFW 2016).

Table 8 (continued). List of additional species detected at Oregon Caves National Monument and Preserve in 2022 (not counted within 50 m during variable circular plot point count surveys) and conservation status. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	OR/WA PIF Conifer ¹	Cont. PIF Northern Pacific Rainforest ²	Cont. PIF Great Basin ²	ODFW Klamath Mountains ³
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	–	–	–	–
Red-tailed Hawk	<i>Buteo jamaicensis</i>	X	–	–	–
Ruby-crowned Kinglet	<i>Corthylio calendula</i>	–	–	–	–
Rufous Hummingbird	<i>Selasphorus rufus</i>	X	W	–	–
Song Sparrow	<i>Melospiza melodia</i>	–	–	–	–
Sooty Grouse	<i>Dendragapus fuliginosus</i>	–	W	–	–
Spotted Towhee	<i>Pipilo maculatus</i>	X	–	–	–
Swainson’s Thrush	<i>Catharus ustulatus</i>	X	–	–	–
Townsend’s Solitaire	<i>Myadestes townsendi</i>	–	–	–	–
Turkey Vulture	<i>Cathartes aura</i>	–	–	–	–
Varied Thrush	<i>Ixoreus naevius</i>	X	D	–	–
Western Wood-Pewee	<i>Contopus sordidulus</i>	–	–	–	–
White-headed Woodpecker	<i>Dryobates albolarvatus</i>	X	–	–	X

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² Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. 2016).

³ Oregon conservation strategy (ODFW 2016).

Oregon Caves National Monument and Preserve Ecological Monitoring Station

The ecological monitoring station at Oregon Caves National Monument and Preserve was run 16 times during 2022. Ten visits occurred during the breeding season (June 1st to August 24th) and 6 visits during the fall dispersal and migration season (September 8th to October 12th). On all visits, 2 area searches were completed. The banding crew was led by KBO staff Claire Stuyck and monitoring was completed with the assistance of Victoria Langham, Axel Rutter, Yuly Lorena Caicedo Ortiz, Victor Armando Sanchez Gonzalez, and Zoya Buckmire.

In 2022, 44 species were detected at Oregon Caves National Monument and Preserve at the ecological monitoring station (Table 9). Thirty-six species were captured during mist-netting, 27 during the breeding season and 19 during the migration season. During area searches 32 species were detected, 14 during the breeding season and 31 during the migration season. Seven species were detected on area searches alone. Overall, the number of species surveyed aligns with past efforts. From 2008 through 2022, 38–59 total species were detected, 27–36 species were captured during mist-netting, and 17–31 species were detected during area search surveys annually (Stephens et al. 2009, 2011, 2022; Stephens, Alexander, and Mohren 2010; Stephens and Mohren 2012, 2013; Stephens 2014, 2015, 2016, 2017; Stephens and Armstrong 2018, 2021; Stephens and Gillespie 2021).

Table 9. Results from the constant effort monitoring station at Oregon Caves National Monument and Preserve in 2022, showing total mist net captures and relative abundance (birds/area search plot) during breeding (1 June to 24 August) and migration (8 September to 12 October), and conservation status. Species are ordered in alphabetical order by common name. Species included in this table with no capture or abundance values were detected at the site, but not during an area search or from mist-net captures. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	Total Captures (breeding)	Total Captures (migration)	Relative Abundance (breeding)	Relative Abundance (migration)	OR-WA PIF Conifer ¹	Cont. PIF Pacific Birds ²
American Robin	<i>Turdus migratorius</i>	1	0	–	0.05	–	–
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	5	8	0.167	0.05	–	–
Black-throated Gray Warbler	<i>Setophaga nigrescens</i>	0	3	–	–	–	–
Brown Creeper	<i>Certhia americana</i>	0	1	0.25	0.55	–	–
Canada Jay	<i>Perisoreus canadensis</i>	1	2	–	0.15	–	–
Cassin’s Vireo	<i>Vireo cassinii</i>	0	1	–	–	–	–
Cedar Waxwing	<i>Bombycilla cedrorum</i>	–	–	–	0.05	–	–
Chestnut-backed Chickadee	<i>Poecile rufescens</i>	9	8	0.583	0.15	–	–
Common Raven	<i>Corvus corax</i>	–	–	–	0.05	–	–
Dark-eyed Junco	<i>Junco hyemalis</i>	26	45	0.917	0.5	–	–
Dusky Flycatcher	<i>Empidonax oberholseri</i>	0	2	–	0.05	–	–
Evening Grosbeak	<i>Coccothraustes vespertinus</i>	–	–	–	0.1	–	–
Fox Sparrow	<i>Passerella iliaca</i>	0	12	–	0.05	–	–
Golden-crowned Kinglet	<i>Regulus satrapa</i>	1	7	0.667	0.25	–	–
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	0	1	–	–	–	–
Hairy Woodpecker	<i>Dryobates villosus</i>	–	–	–	0.25	–	–
Hermit Thrush	<i>Catharus guttatus</i>	1	10	–	–	–	–
Hermit Warbler	<i>Setophaga occidentalis</i>	9	9	0.167	–	X	–

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² Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. (2016).

³ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 9 (continued). Results from the constant effort monitoring station at Oregon Caves National Monument and Preserve in 2022, showing total mist net captures and relative abundance (birds/area search plot) during breeding (1 June to 24 August) and migration (8 September to 12 October), and conservation status. Species are ordered in alphabetical order by common name. Species included in this table with no capture or abundance values were detected at the site, but not during an area search or from mist-net captures. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	Total Captures (breeding)	Total Captures (migration)	Relative Abundance (breeding)	Relative Abundance (migration)	OR-WA PIF Conifer ¹	Cont. PIF Pacific Birds ²
Lazuli Bunting	<i>Passerina amoena</i>	2	0	–	–	X	–
Lincoln’s Sparrow	<i>Melospiza lincolni</i>	0	1	–	–	–	–
MacGillivray’s Warbler	<i>Geothlypis tolmiei</i>	15	15	1	0.45	–	–
Mountain Chickadee	<i>Poecile gambeli</i>	0	1	0.833	0.1	–	–
Nashville Warbler	<i>Leiothlypis ruficapilla</i>	14	26	0.75	0.3	X	–
Northern Flicker	<i>Colaptes auratus</i>	–	–	–	0.1	–	–
Orange-crowned Warbler	<i>Leiothlypis celata</i>	0	3	–	–	X	–
Pacific Wren	<i>Troglodytes pacificus</i>	1	1	–	0.2	X	–
Pacific-slope Flycatcher ³	<i>Empidonax difficilis</i>	2	14	0.25	0.05	X	–
Pileated Woodpecker	<i>Dryocopus pileatus</i>	0	1	–	–	X	–
Red-breasted Nuthatch	<i>Sitta canadensis</i>	3	13	0.167	0.7	–	–
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	2	1	0.333	0.25	–	–
Ruby-crowned Kinglet	<i>Corthylio calendula</i>	0	1	–	0.05	–	–
Rufous Hummingbird	<i>Selasphorus rufus</i>	2	5	–	–	X	W
Sooty Grouse	<i>Dendragapus fuliginosus</i>	1	0	0.083	0.05	X	W
Steller’s Jay	<i>Cyanocitta stelleri</i>	3	11	0.5	1.55	–	–
Swainson’s Thrush	<i>Catharus ustulatus</i>	2	9	–	0.05	–	–
Townsend’s Warbler	<i>Setophaga townsendi</i>	0	6	–	–	–	–

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³ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Table 9 (continued). Results from the constant effort monitoring station at Oregon Caves National Monument and Preserve in 2022, showing total mist net captures and relative abundance (birds/area search plot) during breeding (1 June to 24 August) and migration (8 September to 12 October), and conservation status. Species are ordered in alphabetical order by common name. Species included in this table with no capture or abundance values were detected at the site, but not during an area search or from mist-net captures. “X” are species in the conservation plan; “–” are species not in the conservation plan; “D” are ‘Common Bird in Decline’ for the Pacific Birds Joint Venture region in Rosenberg et al. (2016); “W” are ‘Watch List Species’ (Rosenberg et al. 2016).

Common Name	Scientific Name	Total Captures (breeding)	Total Captures (migration)	Relative Abundance (breeding)	Relative Abundance (migration)	OR-WA PIF Conifer ¹	Cont. PIF Pacific Birds ²
Townsend's X Hermit Warbler	<i>Setophaga townsendi x occidentalis</i>	2	1	–	–	–	–
Townsend's Solitaire	<i>Myadestes townsendi</i>	–	–	–	0.1	–	–
Western Tanager	<i>Piranga ludoviciana</i>	0	1	–	0.1	X	–
Western Wood-Pewee	<i>Contopus sordidulus</i>	–	–	–	0.1	–	–
White-headed Woodpecker	<i>Dryobates albolarvatus</i>	–	–	–	0.1	–	–
Wilson's Warbler	<i>Cardellina pusilla</i>	0	25	–	0.3	–	D
Yellow Warbler	<i>Setophaga petechia</i>	0	1	–	–	–	–
Yellow-rumped Warbler	<i>Setophaga coronata</i>	3	1	–	0.15	–	–

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² Partners in Flight landbird conservation plan, revised in 2016 for Canada and the continental U.S. (Rosenberg et al. (2016).

³ Pacific-slope Flycatcher and Cordilleran Flycatcher were combined under Western Flycatcher in 2023.

Summary

This 14th year of the KLMN landbird monitoring provided information on avian community composition and the status of landbirds at Crater Lake National Park, Lassen Volcanic National Park, Oregon Caves National Monument and Preserve, and Whiskeytown National Recreation Area. In addition, the monitoring at Oregon Caves National Monument and Preserve contributed to the long-term demographic information that has been gathered at this park unit since 2002. Over time, the KLMN landbird monitoring program will yield important information about avian community composition shifts and long-term population trends of specific species for each KLMN park. These monitoring efforts contribute to both Oregon-Washington and California Partners in Flight long-term monitoring programs and align with both Oregon and California State Wildlife Conservation Strategies.

At Crater Lake National Park, the most abundant species were Pine Siskin, Red-breasted Nuthatch, Yellow-rumped Warbler, Mountain Chickadee, and American Robin. Relative abundance appeared to be slightly lower for many common species in 2022 compared to previous years. Long-term monitoring will add to our understanding of relative abundance estimates in these first 5 years.

At Lassen Volcanic National Park, Dark-eyed Junco was the most abundant species during surveys. The most abundant species also included Mountain Chickadee, Yellow-rumped Warbler, American Robin, Golden-crowned Kinglet, and Wilson's Warbler. Relative abundance of the most common species has remained relatively stable across survey years.

The 2 most common species at Whiskeytown National Recreation Area in 2022 were Spotted Towhee and Lesser Goldfinch. Both species were more common than in previous years. Spotted Towhee is included in the California Department of Fish and Wildlife Cascades and Modoc Plateau conservation plan (CDFW 2015). Additionally, Dark-eyed Junco and Black-throated Gray Warbler, 2 of the most common species at Whiskeytown in 2022, are included in the California PIF Coniferous Forest Bird Conservation Plan (CalPIF 2002a).

At Oregon Caves National Monument and Preserve, the most common species was Hermit Warbler. Other common species included Nashville Warbler, Red-breasted Nuthatch, Dark-eyed Junco, and Yellow-rumped Warbler. Several species listed in the Oregon-Washington PIF habitat conservation plan for landbirds in coniferous forests (Altman and Alexander 2012) had lower relative abundance than in previous years, including Lazuli Bunting, Hermit Thrush, Fox Sparrow, and Pacific-slope Flycatcher (recently combined with Cordilleran Flycatcher under Western Flycatcher).

Dark-eyed Junco was the most frequently captured species at the Oregon Caves National Monument and Preserve ecological monitoring station during the combined breeding and migration seasons in 2022. Of the 10 most frequently captured species, Nashville Warbler and Wilson's Warbler are PIF focal species in coniferous forest (Altman and Alexander 2012), and Wilson's Warbler is also a common bird in steep decline (Rosenberg et al. 2016). The Chestnut-backed Chickadee, a Continental Partners in Flight Watch List species, was also among the top 10 species captured (Rosenberg et al. 2016).

Implementation of the KLMN landbird monitoring protocol began in 2008. Landbird status and community composition results from this 14th year of monitoring will provide information to park managers at Crater Lake National Park, Lassen Volcanic National Park, Oregon Caves National Monument and Preserve, and Whiskeytown National Recreation Area, and will contribute to avian trend monitoring in the parks. In addition, continuation of the constant effort monitoring station at Oregon Caves National Monument and Preserve contributes to long-term avian demographic information for that park. This information will inform management decisions at the parks and over time will yield important information on the status and trends of birds in the KLMN.

Literature Cited

- Alexander, J. D., and C. J. Ralph. 2005. Towards a migration monitoring network in the United States. Pages 14–15 in S. K. Skagen, C. P. Melcher, and R. Hazlewood, editors. Migration stopover ecology of western avian populations: A southwestern migration workshop. U.S. Geological Survey, Biological Resources Discipline, Fort Collins, Colorado. Open-File Report 2004-1452.
- Alexander, J. D., C. J. Ralph, K. Hollinger, and B. Hogoboom. 2004. Using a wide-scale landbird monitoring network to determine landbird distribution and productivity in the Klamath Bioregion. Pages 33–41 in K. L. Mergenthaler, J. E. Williams, and E. S. Jules, editors. Proceedings of the second conference on Klamath-Siskiyou ecology. Siskiyou Field Institute, Cave Junction, Oregon.
- Altman, B., and J. D. Alexander. 2012. Habitat conservation for landbirds in coniferous forests of western Oregon and Washington. Version 2.0. Oregon-Washington Partners in Flight, American Bird Conservancy and Klamath Bird Observatory, Ashland, Oregon.
(<https://avianknowledgenorthwest.net/resources/regional-conservation-plans/>).
- Altman, B., and J. L. Stephens. 2022. Conservation of landbirds and associated habitats and ecosystems in the East Cascade Mountains of Oregon and Washington. Version 2.0. Oregon-Washington Partners in Flight, American Bird Conservancy, and Klamath Bird Observatory.
(<https://avianknowledgenorthwest.net/resources/regional-conservation-plans/>)
- CalPIF (California Partners in Flight). 2002a. Version 1.0. The coniferous forest bird conservation plan: A strategy for protecting and managing coniferous forest habitats and associated birds in California (J. Robinson and J. Alexander, lead authors). Point Reyes Bird Observatory, Stinson Beach, California. Available by request from Point Blue Conservation Science, Bolinas, California.
- CalPIF (California Partners in Flight). 2002b. Version 2.0. The oak woodland bird conservation plan: A strategy for protecting and managing oak woodland habitats and associated birds in California (S. Zack, lead author). Point Reyes Bird Observatory, Stinson Beach, California. Available by request from Point Blue Conservation Science, Bolinas, California.
- CalPIF (California Partners in Flight). 2004. Version 2.0. The coastal scrub and chaparral bird conservation plan: A strategy for protecting and managing coastal scrub and chaparral habitats and associated birds in California (J. Lovio, lead author). PRBO Conservation Science, Stinson Beach, California. Available by request from Point Blue Conservation Science, Bolinas, California.
- CalPIF (California Partners in Flight). 2005. Version 1.0. The sagebrush bird conservation plan: A strategy for protecting and managing sagebrush habitats and associated birds in California. PRBO Conservation Science, Stinson Beach, California. Available by request from Point Blue Conservation Science, Bolinas, California.

- CDFW (California Department of Fish and Wildlife). 2015. California state wildlife action plan, 2015 update: A conservation legacy for Californians. Edited by A. G. Gonzales and J. Hoshi, PhD. Prepared with assistance from Ascent Environmental, Inc., Sacramento, California.
- Chesser, R. T., R. C. Banks, F. K. Barker, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, J. D. Rising, D. F. Stotz, and K. Winker. 2011. Fifty-Second Supplement to the American Ornithologists' Union Check-List of North American Birds. *The Auk* 128:600–613.
- DellaSala, D. A., S. B. Reid, T. J. Frest, J. R. Strittholt, and D. M. Olson. 1999. A global perspective on the biodiversity of the Klamath-Siskiyou Ecoregion. *Natural Areas Journal* 19:300–319.
- DeSante, D. F., K. M. Burton, P. Velez, D. Froehlich, D. Kaschube, and S. Albert. 2021. MAPS manual: 2019 protocol. The Institute for Bird Populations, Point Reyes Station, California. Online (<https://www.birdpop.org/docs/misc/MAPSManual19.pdf>).
- DeSante, D. F., J. S. Sarucco, D. R. O'Grady, K. M. Burton, and B. L. Walker. 2004. Methodological considerations of the Monitoring Avian Productivity and Survivorship (MAPS) Program. *Studies in Avian Biology* 29:28–45.
- Fancy, S. G. 1997. A new approach for analyzing bird densities from variable circular-plot counts. *Pacific Science* 51:107–114.
- Gillespie, C. R., E. C. Dinger, S. A. Loredó, and J. L. Stephens. In Review. Klamath Network Landbird Monitoring Protocol implemented at six national parks from 2008–2019 exceeds statistical power benchmarks to detect long-term trends. Natural Resources Report. National Park Service, Fort Collins, Colorado.
- Nelson, J. T., and S. G. Fancy. 1999. A test of the variable circular-plot method when exact density of a bird population was known. *Pacific Conservation Biology* 5:139–143.
- ODFW (Oregon Department of Fish and Wildlife). 2016. Oregon conservation strategy. Oregon Department of Fish and Wildlife, Salem, Oregon.
- Pyle, P. 1997. Identification guide to North American birds, part I. Slate Creek Press, Bolinas, California.
- Ralph, C. J., G. R. Guepel, P. Pyle, T. E. Martin, and D. F. DeSante. 1993. Handbook of field methods for monitoring landbirds. General Technical Report PSW-GTR-144. USDA Forest Service, Pacific Southwest Research Station, Albany, California.
- Ralph, C. J., K. R. Hollinger, and R. I. Frey. 2004. Redwood Sciences Laboratory and the Klamath Demographic Monitoring Network mist-netting station management procedures. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Albany, California.

- Reynolds, R. T., J. M. Scott, and R. A. Nussbaum. 1980. A variable circular-plot method for estimating bird numbers. *Condor* 82:309–313.
- RHJV (Riparian Habitat Joint Venture). 2004. The riparian bird conservation plan: A strategy for reversing the decline of riparian associated birds in California. Version 2.0. California Partners in Flight. Available by request from Point Blue Conservation Science, Bolinas, California.
- Rockwell, S. M., J. D. Alexander, J. L. Stephens, and R. I. Frey. 2016. Bird population trends from constant effort mist netting at Oregon Caves National Monument. Natural Resource Technical Report NPS/ORCA/NRTR—2016/1311. National Park Service, Fort Collins, Colorado.
- Rockwell, S. M., J. L. Stephens, and B. Altman. 2022. Population and habitat objectives for landbirds in prairie, oak, and riparian habitats of western Oregon and Washington Version 2.0. Oregon-Washington Partners in Flight, American Bird Conservancy and Klamath Bird Observatory, Ashland, Oregon. (<https://avianknowledge northwest.net/resources/regional-conservation-plans/>)
- Rosenberg, K. V., J. A. Kennedy, R. Dettmers, R. P. Ford, D. Reynolds, J. D. Alexander, C. J. Beardmore, P. J. Blancher, R. E. Bogart, G. S. Butcher, A. F. Camfield, A. Couturier, D. W. Demarest, W. E. Easton, J. J. Giocomo, R. H. Keller, A. E. Mini, A. O. Panjabi, D. N. Pashley, T. D. Rich, J. M. Ruth, H. Stabins, J. Stanton, and T. Will. 2016. Partners in Flight landbird conservation plan: 2016 revision for Canada and Continental United States. Partners in Flight Science Committee. Cornell Lab of Ornithology, Ithaca, New York.
- Sarr, D. A., D. C. Odion, S. R. Mohren, E. E. Perry, R. L. Hoffman, L. K. Bridy, and A. A. Merton. 2007. Klamath Network vital signs monitoring plan. Natural Resource Report NPS/KLMN/NRR—2007/016. National Park Service, Fort Collins, Colorado.
- Scott, J. M., F. L. Ramsey, and C. B. Kepler. 1981. Distance estimation as a variable in estimating bird numbers from vocalizations. In C. J. Ralph and J. M. Scott, editors. Estimating numbers of terrestrial birds. *Studies in Avian Biology* 6:334–340.
- Stephens, J. L. 2014. Klamath Network landbird monitoring annual report: 2013 results from Crater Lake National Park and Oregon Caves National Monument. Natural Resource Data Series NPS/KLMN/NRDS—2014/689. National Park Service, Fort Collins, Colorado.
- Stephens, J. L. 2015. Klamath Network landbird monitoring annual report: 2014 results from Oregon Caves National Monument, Lava Beds National Monument, and Redwood National and State Parks. Natural Resource Data Series NPS/KLMN/NRDS—2015/816. National Park Service, Fort Collins, Colorado.
- Stephens, J. L. 2016. Landbird monitoring: 2015 results from Lassen Volcanic National Park, Oregon Caves National Monument, and Whiskeytown National Recreation Area. Natural Resource Data Series NPS/KLMN/NRDS—2016/1043. National Park Service, Fort Collins, Colorado.

- Stephens, J. L. 2017. Landbird monitoring: 2016 results from Crater Lake National Park and Oregon Caves National Monument and Preserve. Natural Resource Data Series NPS/KLMN/NRDS—2017/1113. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., J. D. Alexander, and S. R. Mohren. 2009. Klamath Network landbird monitoring annual report: 2008 results from Oregon Caves National Monument, Lava Beds National Monument, and Redwood National and State Parks. Natural Resource Technical Report NPS/KLMN/NRTR—2009/191. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., J. D. Alexander, and S. R. Mohren. 2010. Klamath Network landbird monitoring annual report: 2009 results from Oregon Caves National Monument and Whiskeytown National Recreation Area. Natural Resource Data Series NPS/KLMN/NRDS—2010/043. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., J. D. Alexander, and S. R. Mohren. 2011. Klamath Network landbird monitoring annual report: 2010 results from Crater Lake National Park, Lassen Volcanic National Park, and Oregon Caves National Monument. Natural Resource Data Series NPS/KLMN/NRDS—2011/175. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., and E. E. Armstrong. 2018. Landbird monitoring: 2017 results from Oregon Caves National Monument and Preserve, Lava Beds National Monument, and Redwood National and State Parks. Natural Resource Data Series NPS/KLMN/NRDS—2018/1180. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., and E. E. Armstrong. 2021. Landbird monitoring: 2018 results from Lassen Volcanic National Park, Oregon Caves National Monument and Preserve, and Whiskeytown National Recreation Area. Natural Resource Data Series NPS/KLMN/NRDS—2021/1312. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., E. C. Dinger, and J. D. Alexander. 2019. Established and empirically derived landbird focal species lists correlate with vegetation and avian metrics. *Ecological Applications*: e01865.
- Stephens, J. L., E. C. Dinger, J. D. Alexander, S. R. Mohren, C. J. Ralph, and D. A. Sarr. 2016. Bird communities and environmental correlates in Southern Oregon and Northern California, USA. *PLoS ONE* 11 (10): e0163906.
- Stephens, J. L., and C. R. Gillespie. 2021. Landbird monitoring: 2019 results from Crater Lake National Park and Oregon Caves National Monument and Preserve. Natural Resource Data Series NPS/KLMN/NRDS—2021/1313. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., C. R. Gillespie, and C. M. Stuyck. 2022. Landbird monitoring: 2021 results from Oregon Caves National Monument and Preserve, Lava Beds National Monument, and Redwood National and State Parks. Natural Resource Data Series NPS/KLMN/NRDS—2022/1364. National Park Service, Fort Collins, Colorado. <https://doi.org/10.36967/2294171>.

- Stephens, J. L., and S. R. Mohren. 2012. Klamath Network landbird monitoring annual report: 2011 results from Oregon Caves National Monument, Lava Beds National Monument, and Redwood National and State Parks. Natural Resource Data Series NPS/KLMN/NRDS—2012/317. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., and S. R. Mohren. 2013. Klamath Network landbird monitoring annual report: 2012 results from Oregon Caves National Monument, Lava Beds National Monument, and Redwood National and State Parks. Natural Resource Data Series NPS/KLMN/NRDS—2013/536. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., S. R. Mohren, J. D. Alexander, D. A. Sarr, and K. M. Irvine. 2010. Klamath Network landbird monitoring protocol. Natural Resource Report NPS/KLMN/NRR—2010/187. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., S. R. Mohren, D. C. Barton, J. D. Alexander, and D. A. Sarr. 2013. Estimating bird density and detection probability at five national park units in southern Oregon and northern California. Natural Resource Technical Report NPS/KLMN/NRTR—2013/699. National Park Service, Fort Collins, Colorado.
- Stephens, J. L., S. R. Mohren, F. L. Newell, J. D. Alexander, and D. A. Sarr. 2013. Bird-habitat associations at five national park units in southern Oregon and northern California. Natural Resource Technical Report NPS/KLMN/NRTR —2013/793. National Park Service, Fort Collins, Colorado.
- Stevens, D. L., and A. R. Olsen. 2004. Spatially balanced sampling of natural resources. *Journal of the American Statistical Association* 99:262–278.
- Trail, P. W., R. Cooper, and D. Vroman. 1997. The breeding birds of the Klamath/Siskiyou region. Pages 158–174 in J. J. Beigel, E. S. Jules, and B. Snitkin, editors. *Proceedings of the first conference on Siskiyou ecology*. Siskiyou Regional Education Project, Cave Junction, Oregon.
- US NABCI (U.S. North American Bird Conservation Initiative Monitoring Subcommittee). 2007. Opportunities for improving avian monitoring. U.S. North American Bird Conservation Initiative Report. Available from the Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Arlington, Virginia. (<https://www.nabci-us.org/assets/resources/monitoringreportfinal0307.pdf>).

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1201 Oakridge Drive, Suite 150
Fort Collins, CO 80525