

Intermountain West Shorebird Survey

Shorebird Use of Oregon's wetlands and saline lakes 30 years later

Oregon
1990 - 2026

Final Report to Oregon Department of Fish and Wildlife

July 2026



Summer Lake in April 2026 (Point Blue Conservation Science: Blake Barbaree)
Cover photo of Lake Abert playa in April 2026 (Point Blue Conservation Science: Blake Barbaree)
Logo for Intermountain West Shorebird Survey on cover page is original art from Frances Ngo

Intermountain West Shorebird Survey

Oregon

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Special thanks to the community science volunteer contingent for committing time and resources to count shorebirds often in remote and challenging locations. Elizabeth Huggins volunteered time and at-cost use of a fixed-wing aircraft for surveys 6 or more days per year, On-the-ground surveys would not have been possible without the tremendous efforts of John Reuland, Kevin Spencer, Marty St. Louis to survey large and challenging areas of ten requiring commitments of 5 or 6 days per year.

IMWSS received funding and in-kind support from numerous institutions with the key partners highlighted below.

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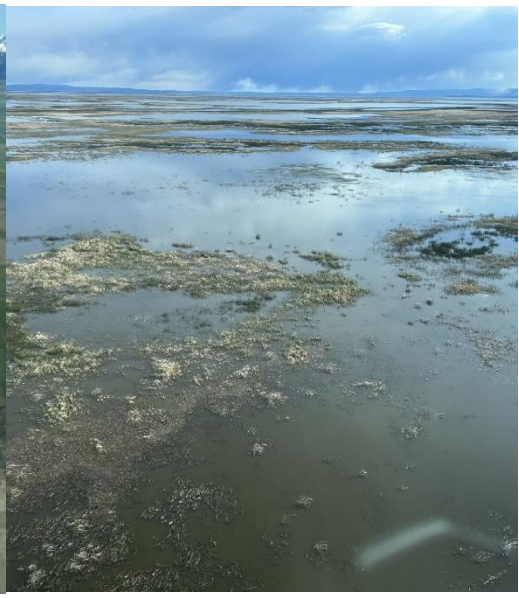

INTRODUCTION

Wetlands and saline lakes of the interior western United States serve as critical stopover habitats within the Pacific Americas Flyway. The Intermountain West Shorebird Survey (IMWSS) is a collaborative of volunteers, government agencies, non-profit, and academic institutions that resumed field surveys 27 years after previous regional surveys ended. The goal was to update regional estimates and long-term trends in shorebird abundance and distribution at 162 sites across 11 western US states. After field surveys covering more than 200 sites from 2022-2026, regional 30+ year trend estimates were available, and IMWSS data was being used to inform stakeholders in Oregon and beyond.

IMWSS expanded upon the Pacific Flyway Project between 1989 and 1995, which provided the first large-scale dataset on inland shorebird migration in the region. The current survey effort (2022–2026) filled a major data gap and enables direct comparisons with historical baselines, offering insight into long-term ecological trends and the health of wetland ecosystems. In Oregon, IMWSS revisited survey efforts from 1990-1995 that covered eastern Oregon's largest wetland systems an expanded on that effort by documented shorebird use at numerous other smaller systems that ranged from freshwater reservoirs to ephemeral alkali lakes.

IMWSS supports shorebird and wetland conservation using a large volunteer network that fosters community-based conservation and numerous partner institutions working together with shared goals and protocols. By combining rigorous, standardized data collection with widespread participation, IMWSS has established networks and information to facilitate science-driven conservation at key wetlands ecosystems across the Intermountain West. Herein, we summarize IMWSS effort and survey results from Oregon, while providing regional context using results from more than 200 wetland sites in the western US.

OBJECTIVES

We had four primary objectives:

1. Document the distribution and abundance of migratory shorebirds across at least 14 sites in eastern Oregon.
2. Collect and manage project data within an online database that is a node of the Avian Knowledge Network.
3. Collate and share project data with key conservation practitioners in Oregon including the Oregon Department of Fish and Wildlife Service and U.S. Fish and Wildlife Service.
4. Summary report of survey results at 14 sites in Oregon from 2022-2025 with reference to surveys by Shuford et al. (2002).

This report fulfills Objective 4 by documenting the methods and results from Objectives 1-3. Work on objectives 1-3 will continue in 2026 and beyond with additional efforts to share results with conservation practitioners in Oregon.

METHODS

Shorebird Surveys

We deployed an observer cohort of professional biologists and community science volunteers to complete surveys across Oregon and portions of 11 western US states (Figure 1). We conducted spring and fall surveys at 21 sites in Oregon from 2022-2026. Observers will be asked to identify shorebirds at the species level whenever possible. For large flocks (>500 individuals), observers will estimate flock size and the proportions of species in the flock to subsequently use the species proportions for calculating species-specific counts. We developed a standardized survey protocol with a baseline protocol (Tier 1) matching Shuford et al. (2002) and a more rigorous tier (2) using portions of the survey protocol from Reiter et al. (2020). The protocol was consistent with methods used by the International Shorebird Survey and follows the guidance of the Program for Regional and International Shorebird Monitoring (2018). We hosted biannual online training sessions on the survey protocol, shorebird identification, and counting techniques from 2023 – 2025. IMWSS protocols, training videos and resources are here: imwss.org/survey-resources.

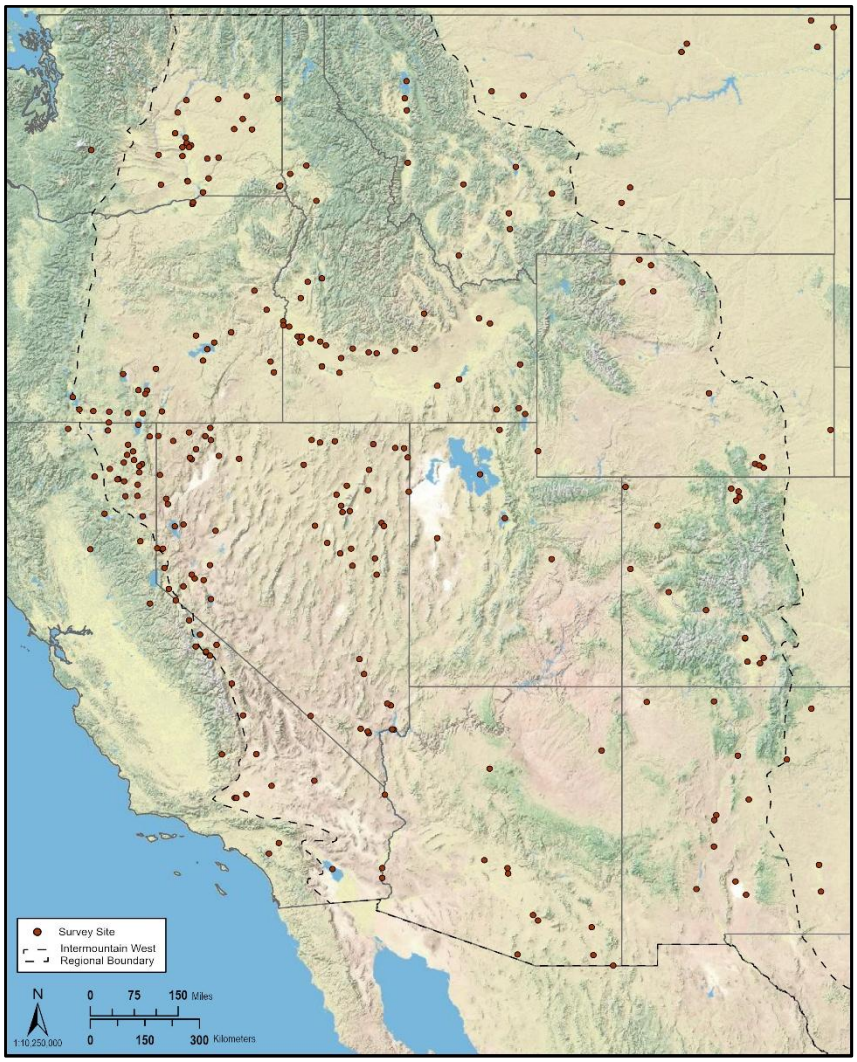

Figure 1. Survey sites for the Intermountain West Shorebird Survey within portions of 11 western US states. Map credit: Emily Hamel of National Audubon Society.

We conducted a single survey during a one-week window during northward migration (24-30 April) and a two-week window during southward migration (9-22 August). We identified survey windows by analyzing eBird Status and Distribution maps for weekly trends in abundance for the maximum overlap across 26 species for a "snapshot" of population distributions each spring and fall (DeLuca et al. 2021). Surveys were conducted between sunrise and sunset on foot using binoculars and spotting scopes and from vehicles to minimize wildlife disturbance in certain managed wetlands and agricultural areas. We followed recommendation by Warnock et al. (1998) to pair ground surveys in accessible areas with aerial or boat surveys to cover accessible portions of larger sites; we used this approach for Upper Klamath Lake, Summer Lake, Lake Abert, and Harney Basin – Malheur Lake. Aerial surveys alone were used for several remote sites across eastern Oregon.

Data Management

All data collected as part of IMWSS are organized and managed in the Avian Knowledge Network (AKN; avianknowledge.net) within the project "IMWSS". The AKN is an online framework for collecting and managing environmental survey data. A former node of the AKN, the California Avian Data Center, was dissolved during the Federal Risk and Authorization Management Program cloud security certification process in 2024. The data entry interface for IMWSS was a modified version of the framework used for the Pacific Flyway Shorebird Survey (pointblue.org/pfss) and Migratory Shorebird Project (migratoryshorebirdproject.org), a shorebird monitoring network with sites across 13 counties of the Pacific Americas Flyway. Data entry instructions can be found online here: imwss.org/survey-resources.

IMWSS data are accessible via download on AKN and by request from an IMWSS or Point Blue representative. IMWSS representatives can be identified on the IMWSS website or by emailing DataSolutions@pointblue.org. Data sharing levels represent the need and process for approval when data requests are received.

Summary and Analysis

We summarized survey efforts and total shorebirds counts by season and year within Oregon and across the regional study area. Data analyses on changes in shorebird abundance and distribution were led by a graduate student at Utah State University (USU) in the lab of Dr. T.J. Clark-Wolf (www.clarkwolflab.com/team). We provided proofed raw data from the surveys as an attachment to this report, along with summary data that include mixed-species flock counts that were allocated to individual shorebird species. To allocate mixed species counts, we used the proportions of individual species identified at the species level during ground counts at the site where the mixed species counts occurred and counts for those species at the ten nearest sites; we used data from the same season as the mixed species count to estimate species proportions for all mixed species counts except for Long-billed Dowitchers and Short-billed Dowitchers.

We suggest caution when interpreting summaries of only the raw, proofed data. Results from the statistical analyses led by USU on long term trends, including environmental covariates related to wetland extent, provide a robust insight into rates of change in shorebird populations and wetlands across the region. Survey data from a single site provides insight into the key species and seasons for shorebirds at the sites, but additional surveys may be necessary for robust estimates of changes at the site level.

RESULTS

Regional Summary

The total number of shorebirds counted across the IMWSS region was less than or similar to historical surveys despite recent surveys including more than twice as many sites per season on average (Figure 2). We counted more than >90% of shorebirds at 10 key sites including four in Oregon (Figure 2; Klamath Basin includes wetland in California). Other sections of this report focus on IMWSS results from the state of Oregon.

Results of analyses by USU on the 30-year regional trends in shorebird populations and wetland extent can be found within a Master's these available here: https://digitalcommons.usu.edu/etd2023/868

In summary, Montecino (2026) reports that "the analysis showed that ~88% of shorebirds in the region relied on only nine wetlands during spring and fall migrations, and seven of these nine sites were saline lakes. Overall, shorebirds declined by 36% in fall and 53% in spring between 1994-1995 and 2022-2025, with more than three-quarters of the 160 evaluated sites holding significantly fewer individuals. Common species, including dowitchers, American Avocets, and Black-necked Stilts, exhibited the steepest declines, averaging 72%, 68%, and 59%, respectively. The extent of surface water in wetlands decreased by ~17% during the same period and was the strongest factor influencing the declines in shorebird numbers. It remained the most important factor in recent years, despite unusually wet and dry years between 2022 and 2025."

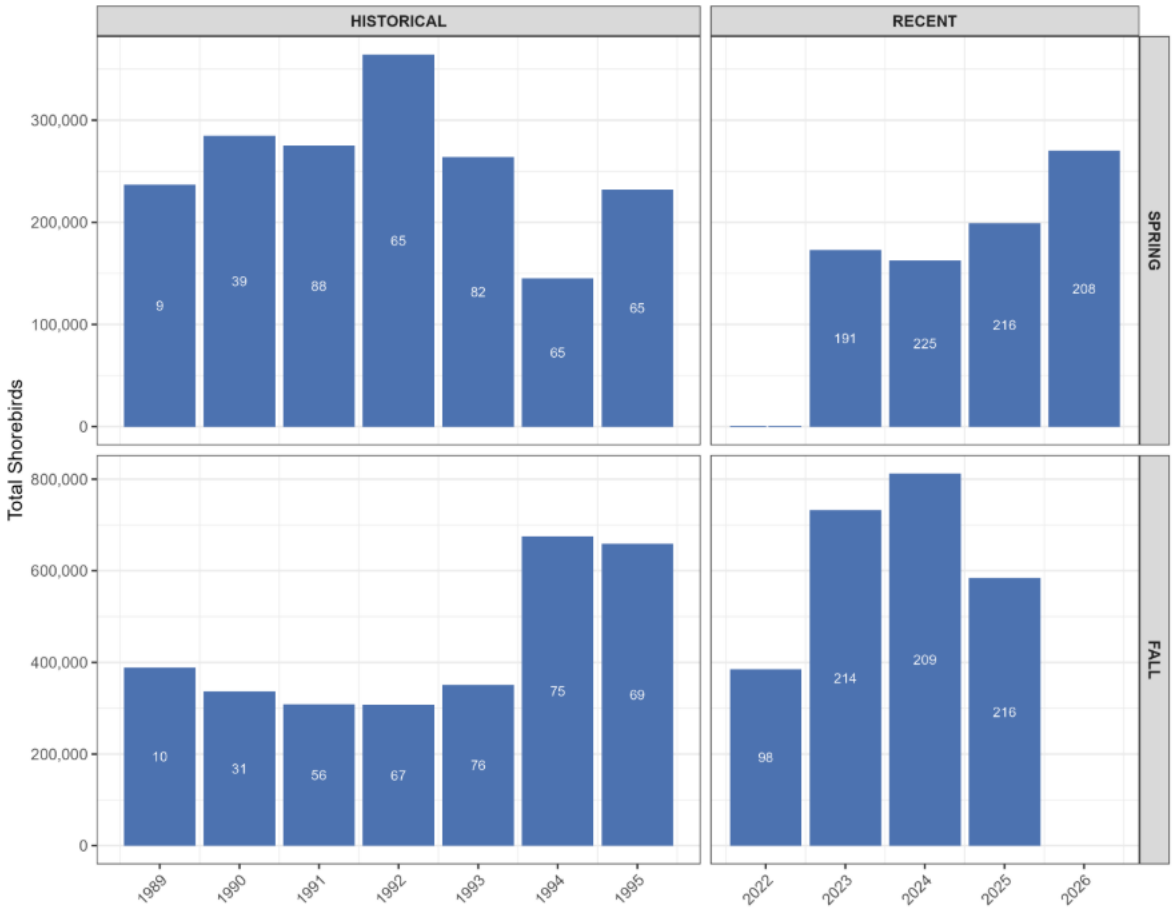

Figure 2. Total shorebirds counted by season and year for the historical and recent periods across the Intermountain West study area. The white number inside each bar is the total number of sites surveyed that season.

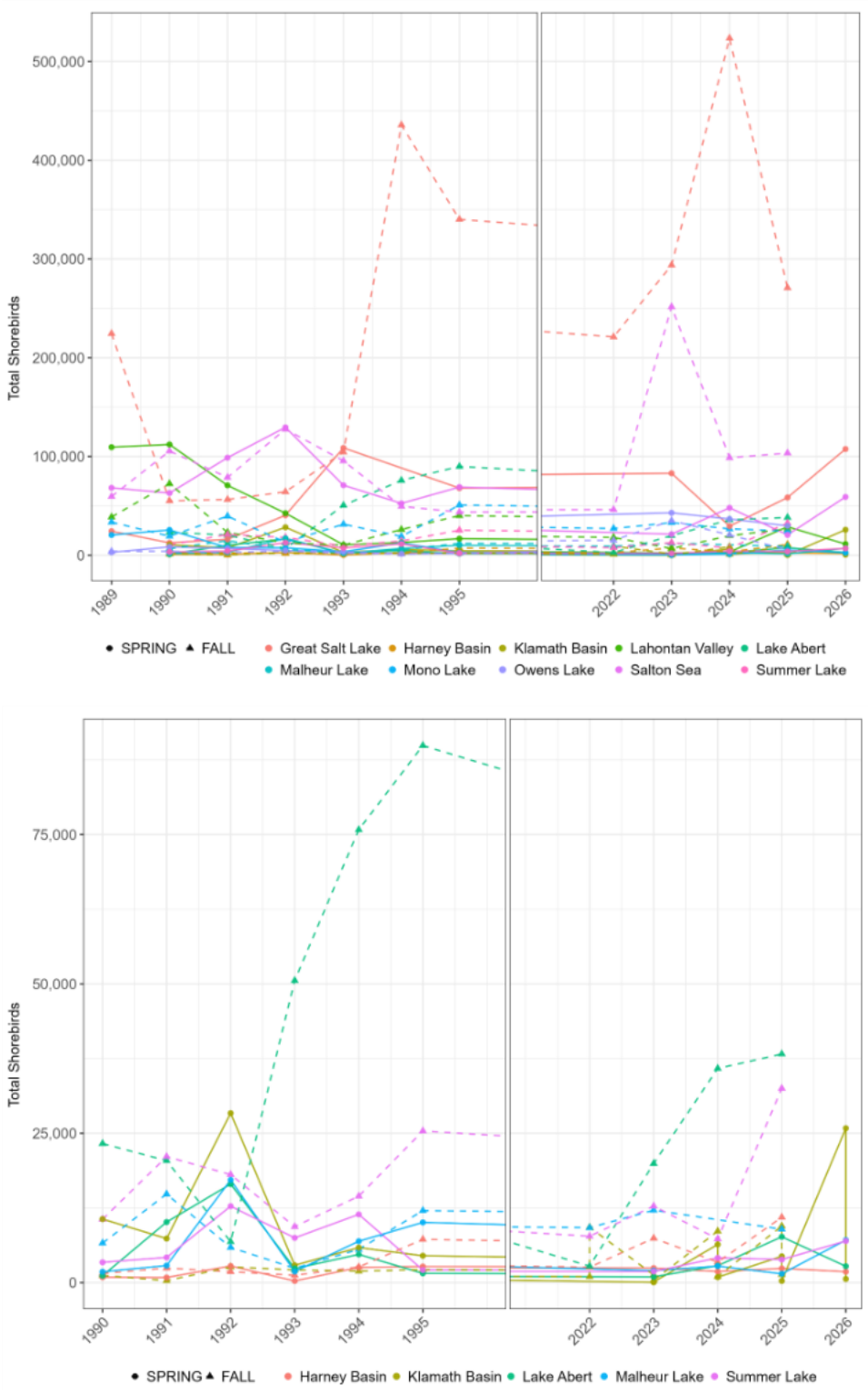

Figure 3. Results from ten key sites that accounted for >90% of the regional total on average summarized as total shorebird counts by season and year for both periods (top) and the key sites in Oregon only (bottom). Klamath Basin total counts include portions of Oregon and California.

Statewide Summary

We conducted two or more surveys for spring and fall at 21 sites in Oregon, and three or more surveys per season at 18 sites (Table 1). The historic survey primarily focused on the largest sites: Harney Basin, Malheur Lake, Summer Lake, Lake Abert, Warner Valley. The contemporary surveys included additional sites opportunistically during aerial surveys or volunteer interest. The complete contemporary dataset from sites in Oregon is available upon request. Summary results and metadata on Oregon IMWSS sites are in the Appendix.

Between historical and recent surveys, a total of 883,509 shorebirds were counted across the interior of Oregon. Fall counts averaged higher than spring counts, which aligns with the pattern observed throughout the broader Intermountain West. Historical counts (1990s) averaged higher than recent counts (2020s), but there was substantial overlap in the range of counts (Figure 4).

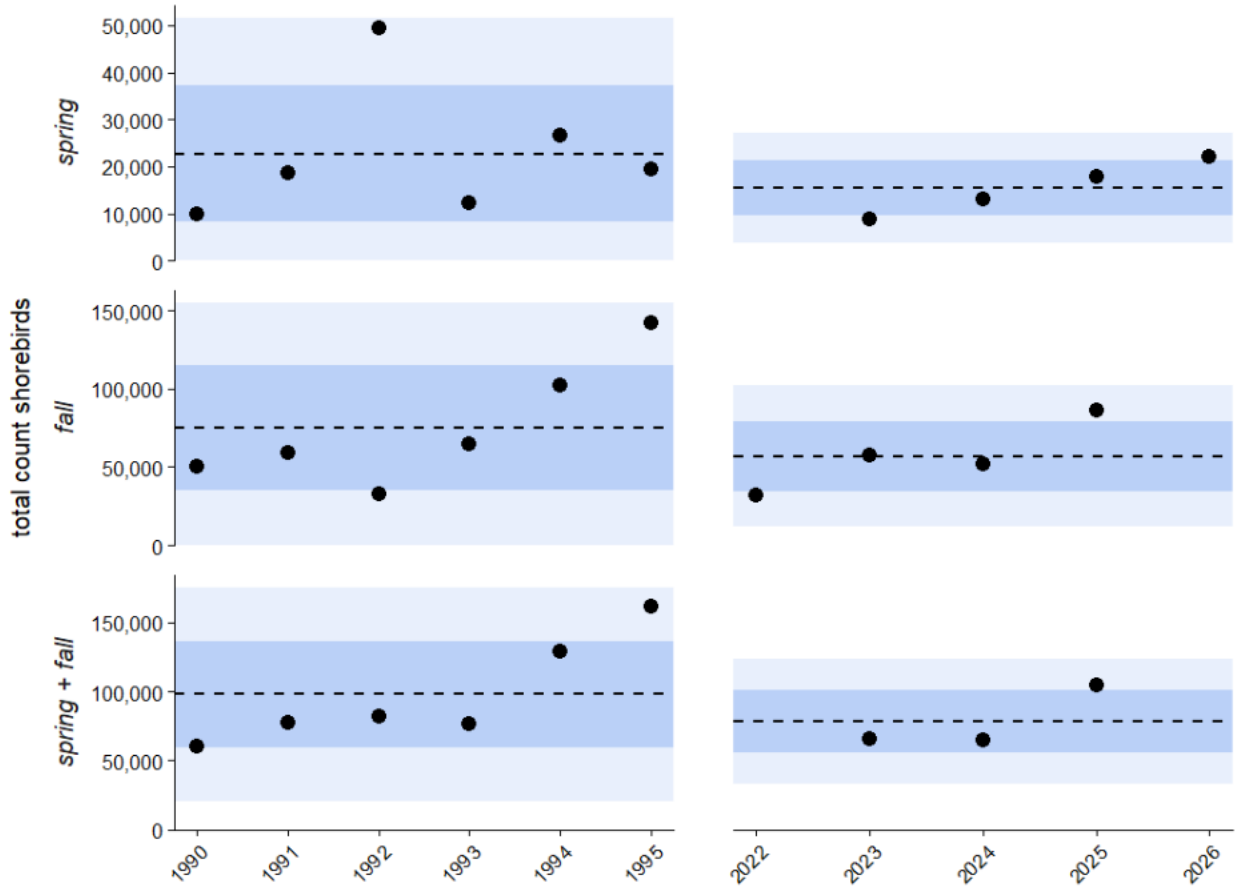

Figure 4. The total count of shorebirds from Oregon surveys, with panels split by season and time period. In each panel, the dashed line indicates the mean count, and the shaded boxes are ± 1 and 2 standard deviations.

Table 1. Survey effort as number of surveys per site and season in historic and contemporary IMWSS surveys in the state of Oregon.

Site	Period	Season	Surveys	Total Shorebirds
Oregon	Historic	FALL	37	450482
		SPRING	30	136553
	Recent	FALL	66	234650
		SPRING	75	61824
Alkali Lakes	Historic	FALL	1	64
	Recent	FALL	3	0
		SPRING	3	16
Antelope Reservoir	Historic	FALL	1	212
	Recent	FALL	4	1888
		SPRING	4	759
Bully Creek Reservoir	Historic	FALL	1	494
	Recent	FALL	3	227
		SPRING	3	36
Burns Sewage Ponds	Historic	FALL	1	88
	Recent	FALL	3	581
		SPRING	4	169
Chewaucan Marshes	Recent	FALL	2	194
		SPRING	4	4424
Cold Springs NWR	Recent	FALL	2	481
		SPRING	3	34
Cow Lakes	Historic	FALL	1	540
	Recent	FALL	4	473
		SPRING	4	433
Drews Reservoir	Recent	FALL	3	95
		SPRING	4	19
Gerber Reservoir	Recent	FALL	2	88
		SPRING	2	38
Harney Basin	Historic	FALL	6	16879
		SPRING	6	10048
	Recent	FALL	4	24370
		SPRING	4	8499
Klamath Basin (Oregon)	Recent	FALL	4	12033
		SPRING	4	1903
Lake Abert	Historic	FALL	6	266818
		SPRING	6	36400
	Recent	FALL	4	96789
		SPRING	4	14192
Lakeview WTP	Recent	FALL	3	2054
		SPRING	3	0
Malheur Lake	Historic	FALL	6	47329
		SPRING	6	40711
	Recent	FALL	3	30255
		SPRING	4	13351
Malheur Reservoir	Historic	FALL	1	249
	Recent	FALL	3	181
		SPRING	4	109
Summer Lake	Historic	FALL	6	98979
		SPRING	6	41423
	Recent	FALL	4	60373
		SPRING	4	16827
Umatilla NWR	Recent	FALL	2	0
		SPRING	2	0
Warm Springs Reservoir	Historic	FALL	1	47
	Recent	FALL	3	813
		SPRING	4	102
Warner Valley	Historic	FALL	6	18783
		SPRING	6	7971
	Recent	FALL	4	1273
		SPRING	4	356
Willow Valley Reservoir	Recent	FALL	3	110
		SPRING	3	9
Langell Valley	Recent	FALL	3	2372
		SPRING	4	548

A total of 29 species of shorebirds were documented statewide (Figure 5). Several sandpipers of the genus *Calidris* ("peeps") were the most numerous spring species, including Least Sandpiper, Western Sandpiper, and Dunlin. Both Wilson's and Red-necked Phalaropes, relatively uncommon during spring counts, were abundant during fall migration. American Avocets were one of the most abundant migrants across both survey periods and seasons. Numerous other species were documented less commonly.

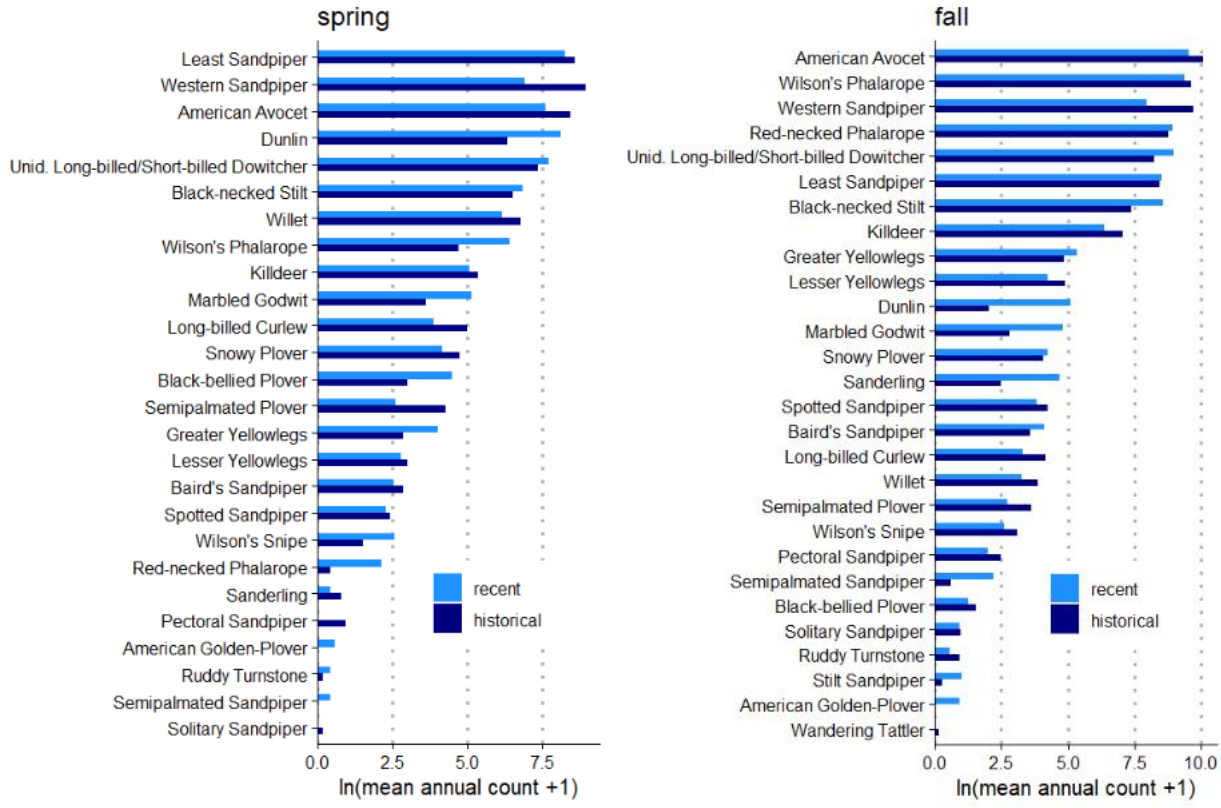

Figure 5. Mean annual counts of all species of shorebirds observed during IMWSS events. Note that counts are shown on a logarithmic scale, such that 1 more unit on the x-axis corresponds to 2.73 times more birds counted.

Several shorebirds with conservation status were recorded during IMWSS surveys in Oregon. While conservation schema differ in listed shorebirds (Table 2), we observed many federal, state, and other conservation targets alike. We observed five species identified in Oregon's *State Wildlife Action Plan* (2025), American avocets and Wilson's phalaropes were the most numerous (i.e., tens of thousands of each routinely observed in the fall; Figure 6). Long-billed Curlews, Snowy Plovers, and Willets were recorded at lower abundances (i.e., tens to hundreds of each).

Table 2. Conservation statuses of shorebirds observed in Oregon during Intermountain West Shorebird Surveys (IMWSS). It includes USFWS (2021) Birds of Conservation Concern (BCC), Partners in Flight et al. (2025) "Tipping Point" species (SOTB), and Species of Greatest Conservation Need (SGCN) in State Wildlife Action Plans. The 2026 Partners in Flight Avian Conservation Assessment Database (ACAD) continental scores indicate greater urgency with higher values up to a maximum of 20. Oregon's Cumulative Count reflects total regional observations across all seasons, incorporating partially identified birds statistically assigned to species based on survey proportions.

Species	BCC	SOTB	SGCN States	ACAD	Cumulative Count, OR
American Avocet			CA, NV, OR, UT, WA	11	239,986
American Golden-Plover	Yes	Orange		15	9
Baird's Sandpiper				13	601
Black-bellied Plover		Orange	CA	13	500
Black-necked Stilt			MT	8	39,207
Dowitcher spp.*		Orange	CA, NV, NM	14	73,845
Dunlin				12	17,730
Greater Yellowlegs		Orange	NM	14	1,897
Killdeer			AZ, NM	10	11,201
Least Sandpiper				11	97,767
Lesser Yellowlegs	Yes	Orange	CA	13	1,241
Long-billed Curlew			CO, ID, MT, NV, NM, OR, UT, WA, WY	12	1,570
Marbled Godwit	Yes		CA, MT	15	1,482
Pectoral Sandpiper	Yes	Orange	CA	14	99
Red-necked Phalarope			NV	11	69,938
Ruddy Turnstone		Orange	CA	14	15
Sanderling		Orange	CA	13	510
Semipalmated Plover				13	754
Semipalmated Sandpiper		Orange		14	39
Snowy Plover	Yes	Yellow	AZ, CA, NV, NM, OR, UT, WY	14	1,555
Solitary Sandpiper			MT	10	17
Spotted Sandpiper			AZ, NM	12	698
Stilt Sandpiper		Orange		15	9
Wandering Tattler	Yes	Yellow	CA	14	1
Western Sandpiper			NV, NM	14	162,200
Willet	Yes		CA, OR	14	7,534
Wilson's Phalarope			CO, NV, OR, UT	11	145,495
Wilson's Snipe				9	248

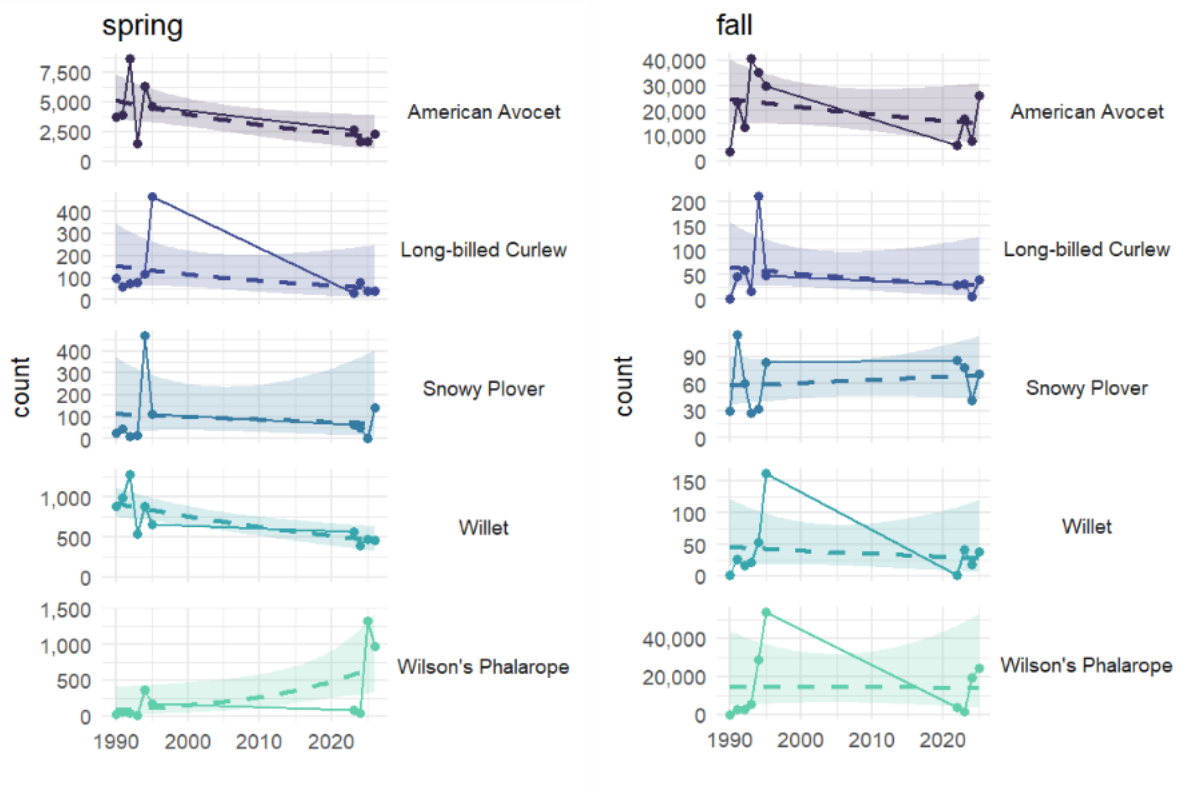

Figure 6. Counts of shorebirds identified as "Species of Greatest Conservation Need" in Oregon's State Wildlife Action Plan. Each panel's dashed line and shading represent a quasi-Poisson smoother fit to the data.

The five large sites monitored during historical surveys (Harney Basin, Malheur Lake, Lake Abert, Summer Lake, Warner Valley) remained important anchors of shorebird abundance based on recent surveys (Figure 6). Fall counts at Lake Abert reliably yielded the highest number of shorebirds at any one site. The expanded scope of coverage revealed other significant sites as well (Figure 7).

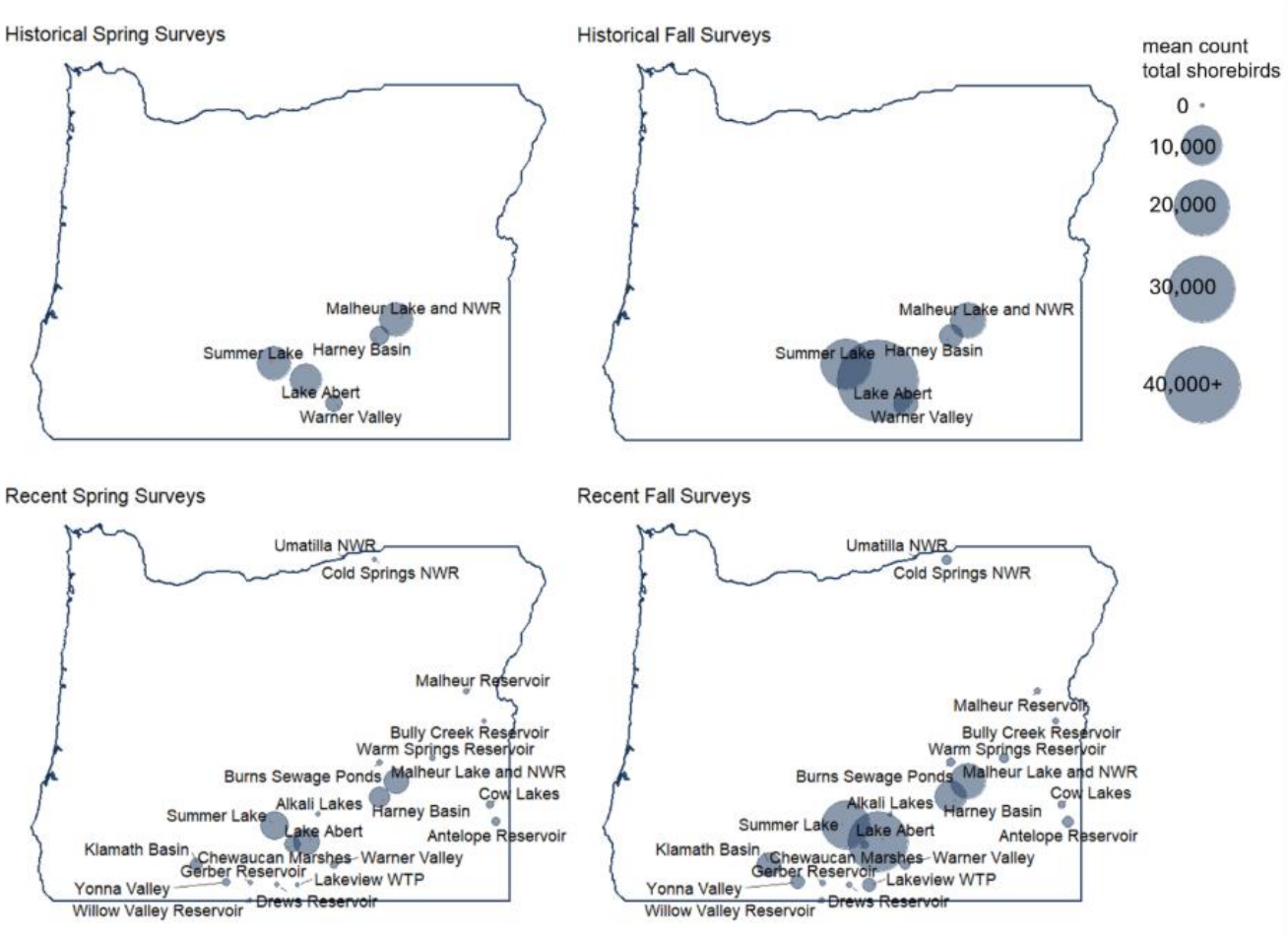

Figure 7. Mean shorebirds count by site. Larger circles indicate higher counts, and the scale is consistent across panels. The historical surveys focused primarily on five large sites, and other sites visited occasionally are not shown.

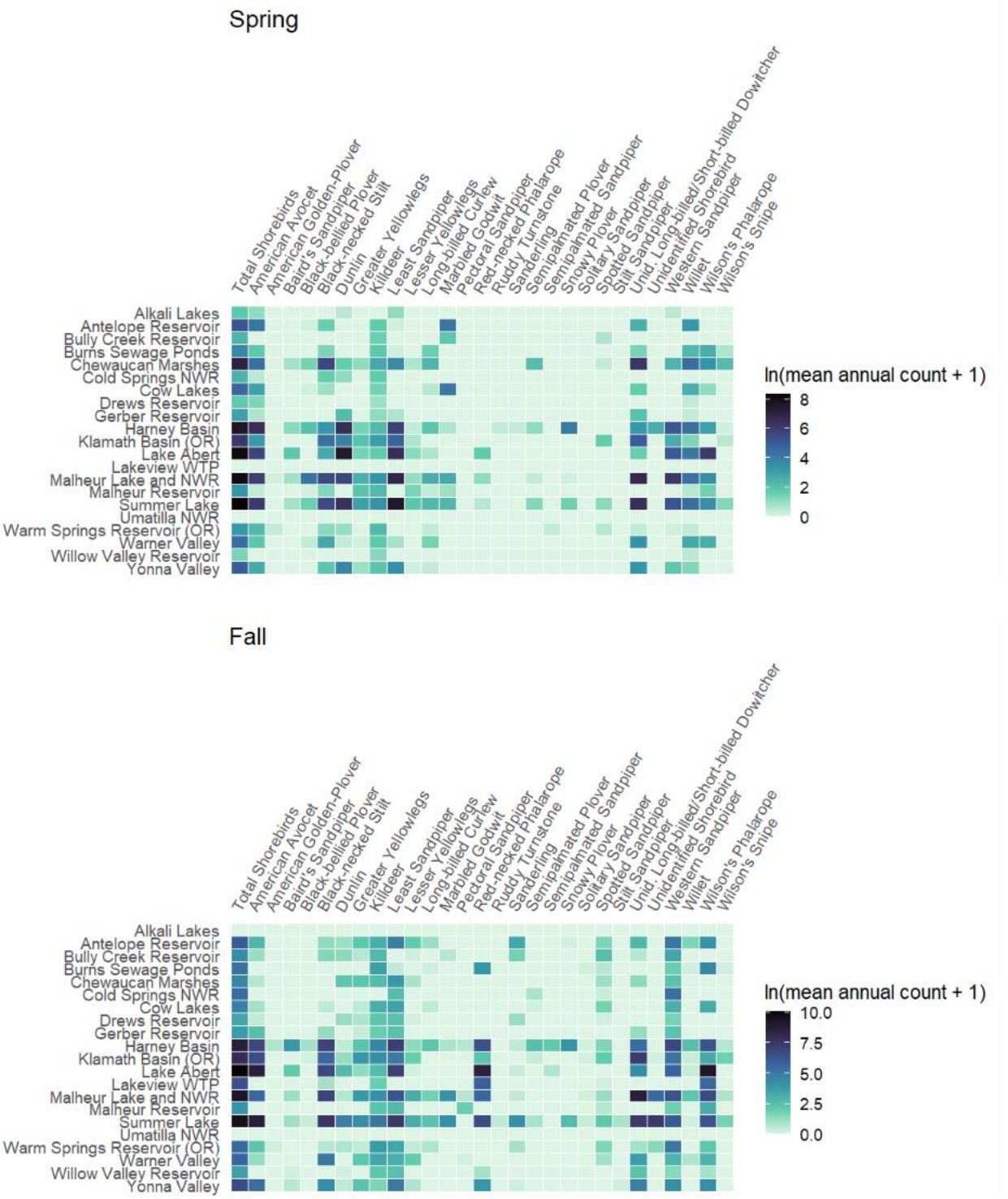

Figure 8. Heatmap of abundance of shorebird species during spring (top) and fall (bottom) at Oregon survey sites during the recent round of IMWSS (2022 - 2026) only. Note that counts are shown on a logarithmic scale, such that 1 more unit corresponds to 2.73 times more birds counted.

OUTCOMES AND CONCLUSIONS

Over the past four years, an average of over 15,000 shorebirds used habitat in Oregon's Intermountain West each spring, while an average of over 56,000 shorebirds used the same habitat each fall. Historically, the averages were over 22,000 in spring and over 75,000 in fall. While additional statistical modelling is required to account for factors like differences in survey timing and coverage, the overall pattern of decline aligns with observations elsewhere in the Pacific Americas Flyway (Reiter et al. 2025) and at the continental scale (Smith et al. 2024). Further, recent counts average lower than historical ones despite adding monitoring at several smaller sites in the recent surveys.

Wetland conditions shifted dramatically over the course of the recent survey from 2022 – 2026. In August 2022, IMWSS resumed during an extreme drought across the Intermountain West that resulted in widespread drying of many wetland systems entirely or almost entirely, including Lake Abert (Hall et al. 2023). A record-breaking level of precipitation occurred during the winter in 2022 – 2023 that refilled most lakes and reservoirs across the region, but average to below average precipitation from 2024 – 2025 led to the return of drought conditions in early 2026 (Swarr et al. 2026). The extreme interannual variation in freshwater availability for wetlands within the project area is likely to continue with more frequent extreme highs and lows, which exemplifies the challenges faced by migratory birds reliant upon wetland systems in Oregon. Water and wetland management decisions based on the best available science will be necessary to maintain and restore wetland system function to sustain both human and wildlife populations.

Regional IMWSS results and conclusions are discussed in Montecino (2026). Additional research may be needed to draw robust conclusions regarding long-term changes in shorebirds at the species and site levels in Oregon and other US states.

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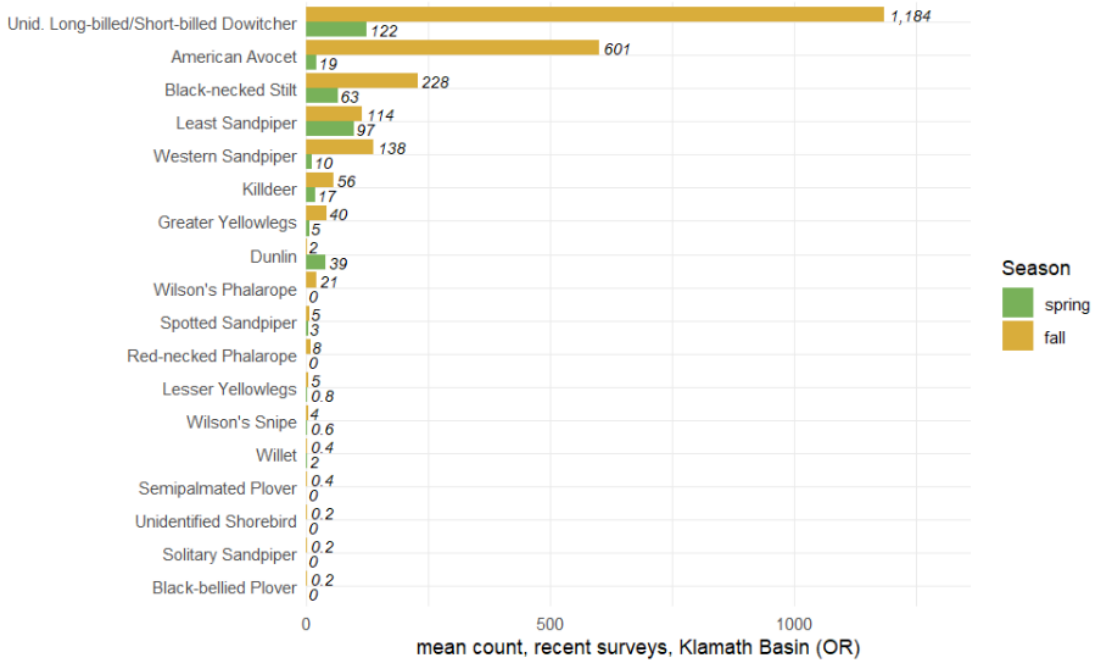
APPENDIX: Oregon Shorebird Sites - Metadata and Data Summary Plots

Results from individual shorebird sites are presented from west to east. Each site summary includes metadata on the geographic location, the U.S. Geological Survey hydrologic basin and unit (HUC4), salinity, and stakeholders. The bar graphs presented for each site convey species richness and composition (i.e., number of rows) and their mean seasonal abundance (values are rounded to nearest whole number for means greater than one). Time series plots are provided for five sites with a full complement of historic and recent surveys.

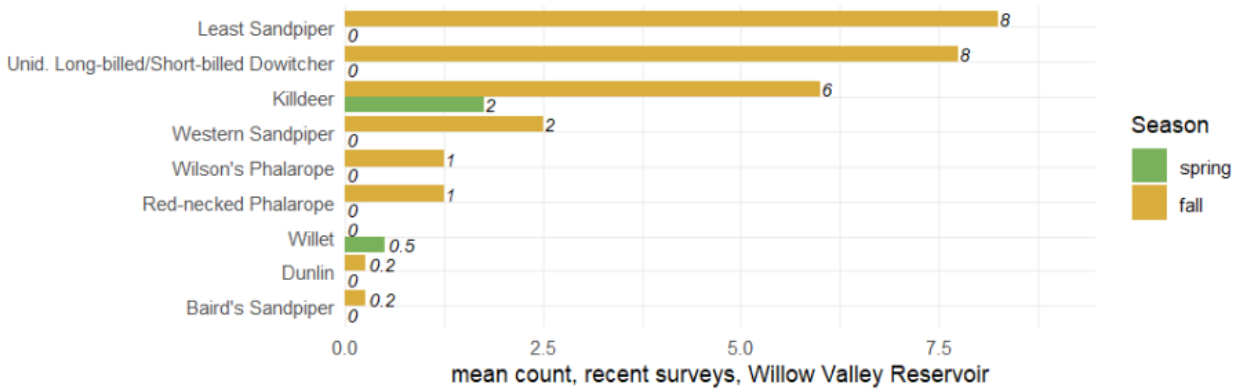
Klamath Basin – Oregon only

- County: Klamath County (primary), also Lake County
- Location (latitude, longitude): 42.40000, -121.80000
- Basin: Klamath Basin
- HUC4: 180102
- Salinity: Mixed freshwater marshes, lakes, managed wetlands
- Ownership: Complex, multi-jurisdictional system including federal refuge lands (US Fish and Wildlife Service; USFWS), Bureau of Reclamation (BOR), tribal trust lands (Klamath Tribes).
- Water managers: USFWS (Klamath Refuge Complex), BOR, Klamath Tribes, irrigation districts, private irrigators.
- Conservation partnerships:
    - Klamath Watershed Partnership: https://www.klamathpartnership.org/
    - Klamath Basin Science Collaborative: https://klamath-basin-sdm.gitbook.io/doc
- Historic shorebird site: No



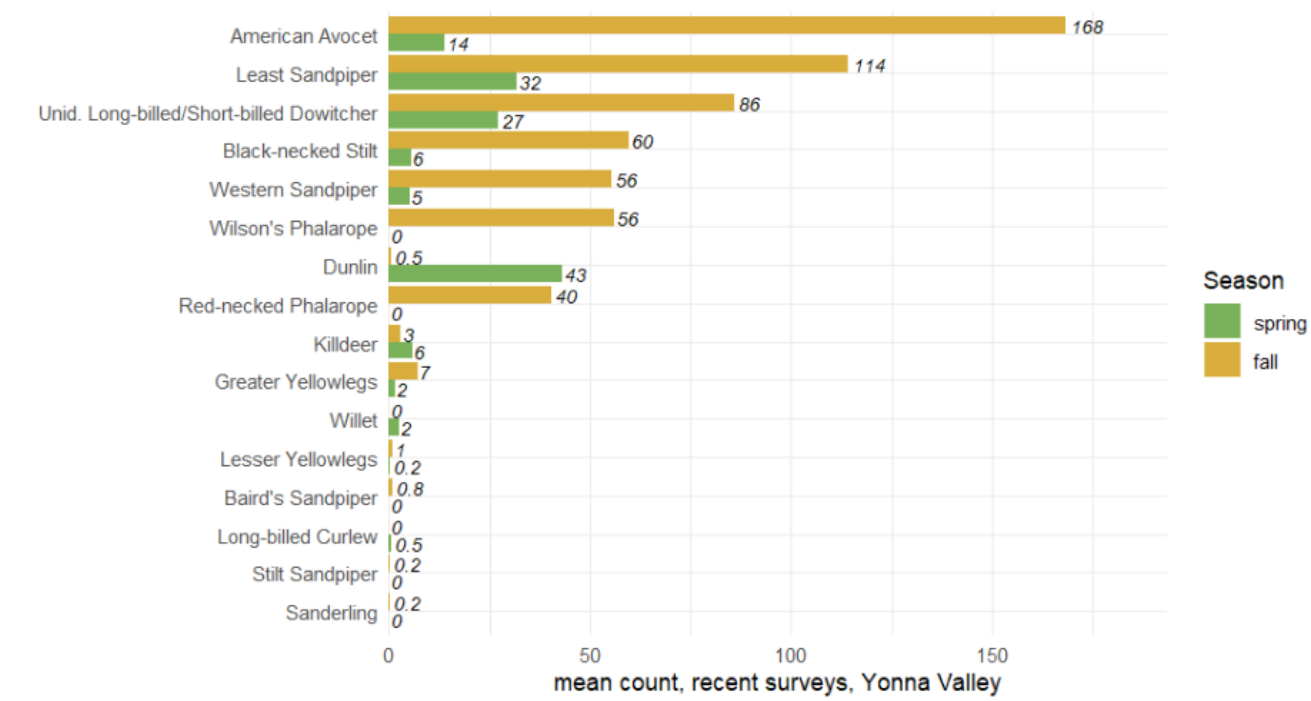
Willow Valley Reservoir

- County: Klamath County, Oregon
- Location (latitude, longitude): 42.08000, -121.43000
- Basin: Klamath Basin
- HUC4: 180102
- Salinity: Freshwater
- Ownership: State and Private
- Water managers: Oregon Water Resources Department (OWRD), private irrigators
- Conservation partnerships:
    - Klamath Watershed Partnership: https://www.klamathpartnership.org/
- Historic shorebird site: No



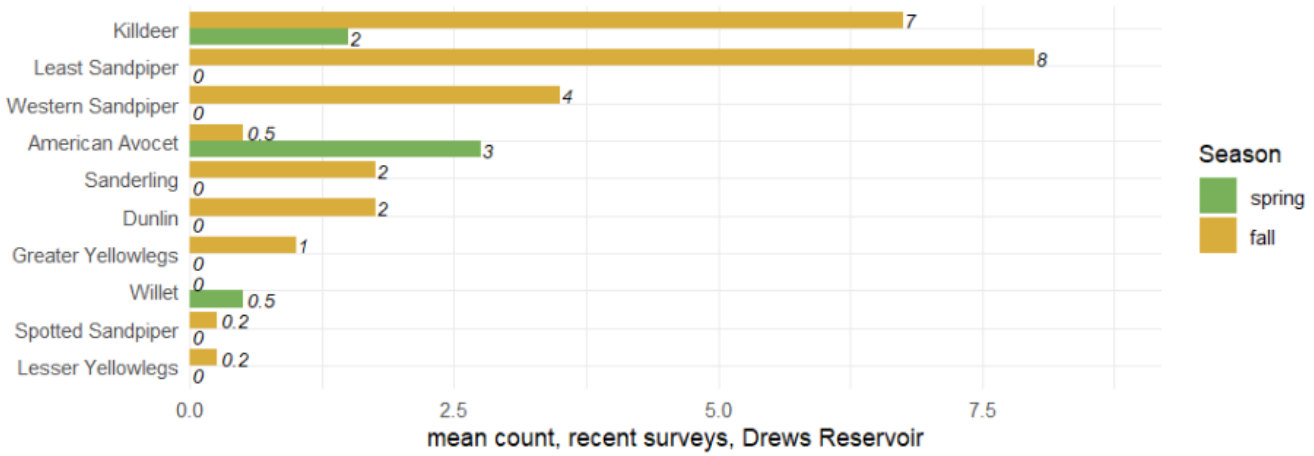
Langell Valley (Yonna Valley alkali lake)

- County: Klamath County, Oregon
- Location (latitude, longitude): 42.02000, -121.05000
- Basin: Klamath Basin
- HUC4: 180102
- Salinity: Freshwater agricultural wetlands
- Ownership: Mixed Federal and Private
- Water managers: BOR, Langell Valley Irrigation District, private irrigators
- Conservation partnerships:
    - Klamath Watershed Partnership https://www.klamathpartnership.org/
- Historic shorebird site: No



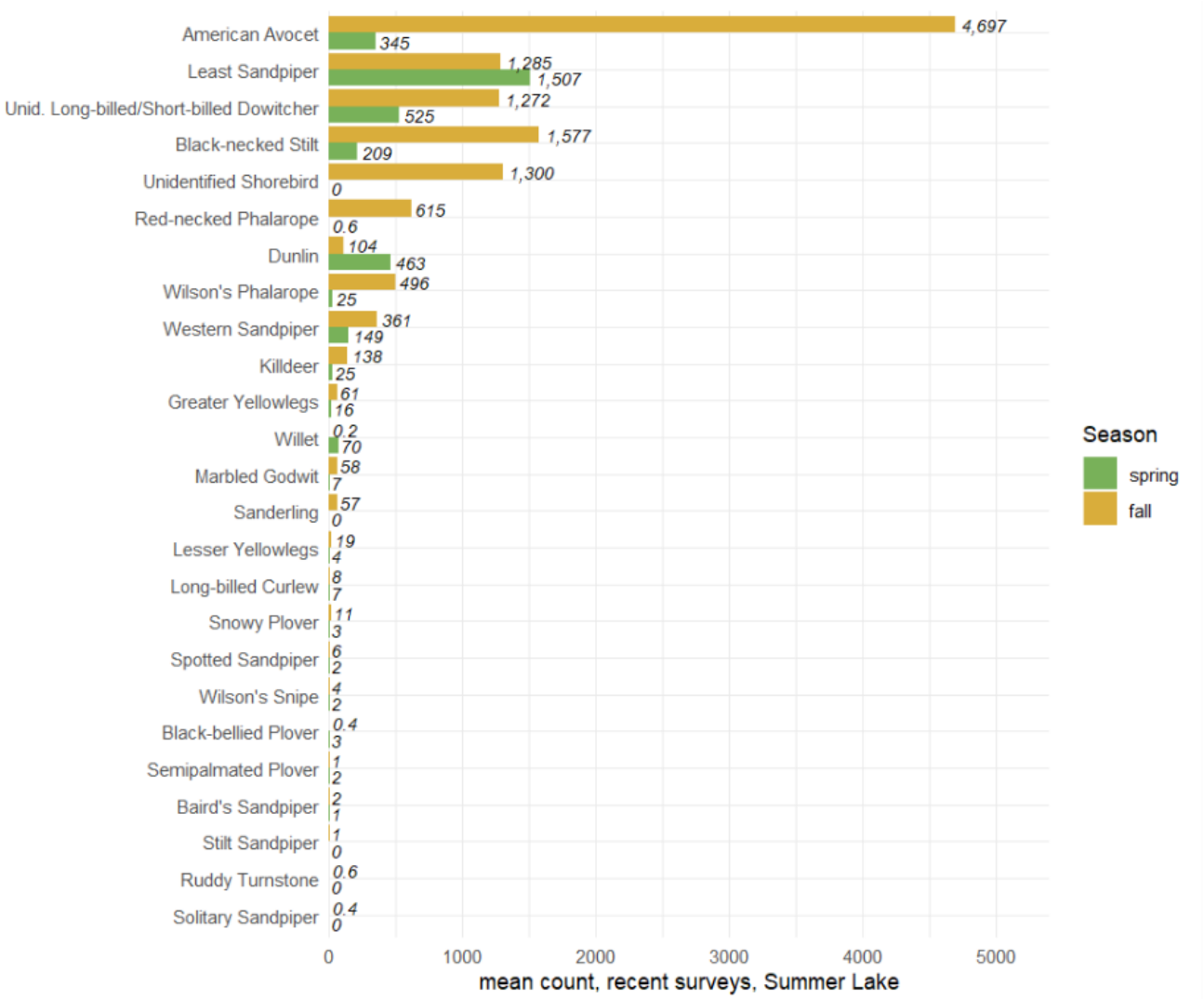
Drews Reservoir

- County: Lake County, Oregon
- Location (latitude, longitude): 42.22000, -120.86000
- Basin: Goose Lake Basin
- HUC4: 180200
- Salinity: Freshwater
- Ownership: State and Private
- Water managers: OWRD, local irrigation users
- Conservation partnerships:
    - Lake County Umbrella Watershed Council https://lakecountywsc.com/
- Historic shorebird site: No

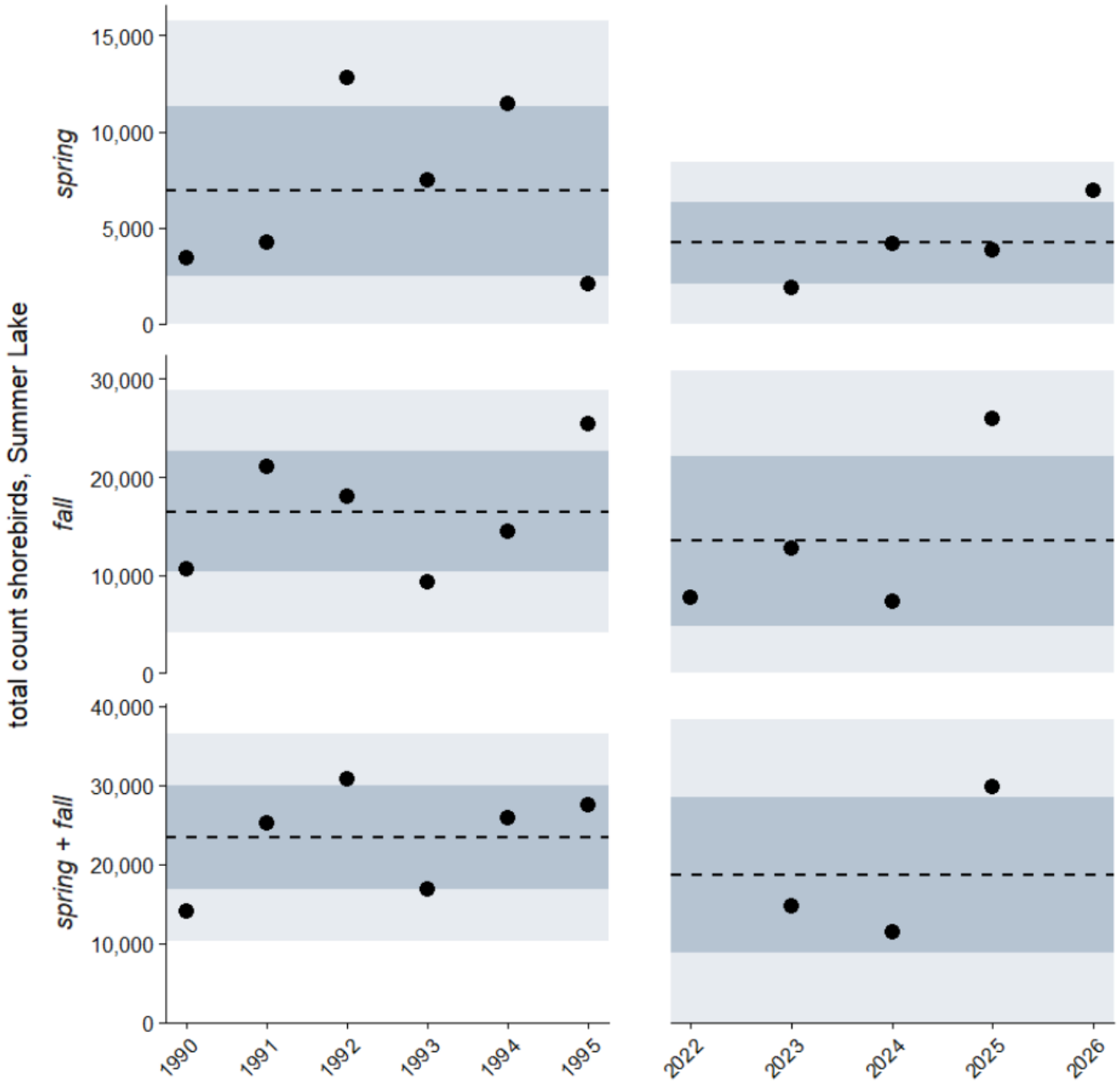


Summer Lake

- County: Lake County, Oregon
- Location (latitude, longitude): 42.83000, -120.75000
- Basin: Fort Rock – Summer Lake Basin
- HUC4: 171200
- Salinity: Shallow alkali, saline
- Ownership: State and Private
- Water managers: ODFW, private irrigators
- Conservation partnerships:
    - Lake County Umbrella Watershed Council: https://lakecountywsc.com/home
- Historic shorebird site: Yes

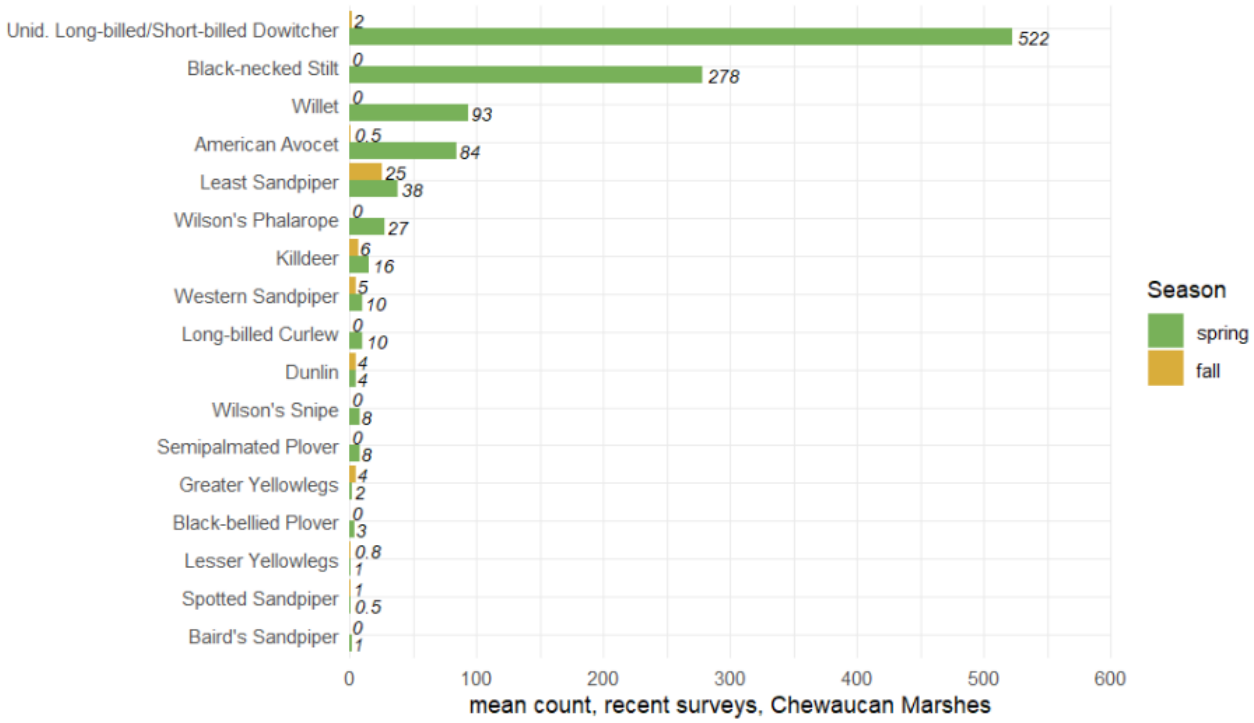


Summer Lake (continued)



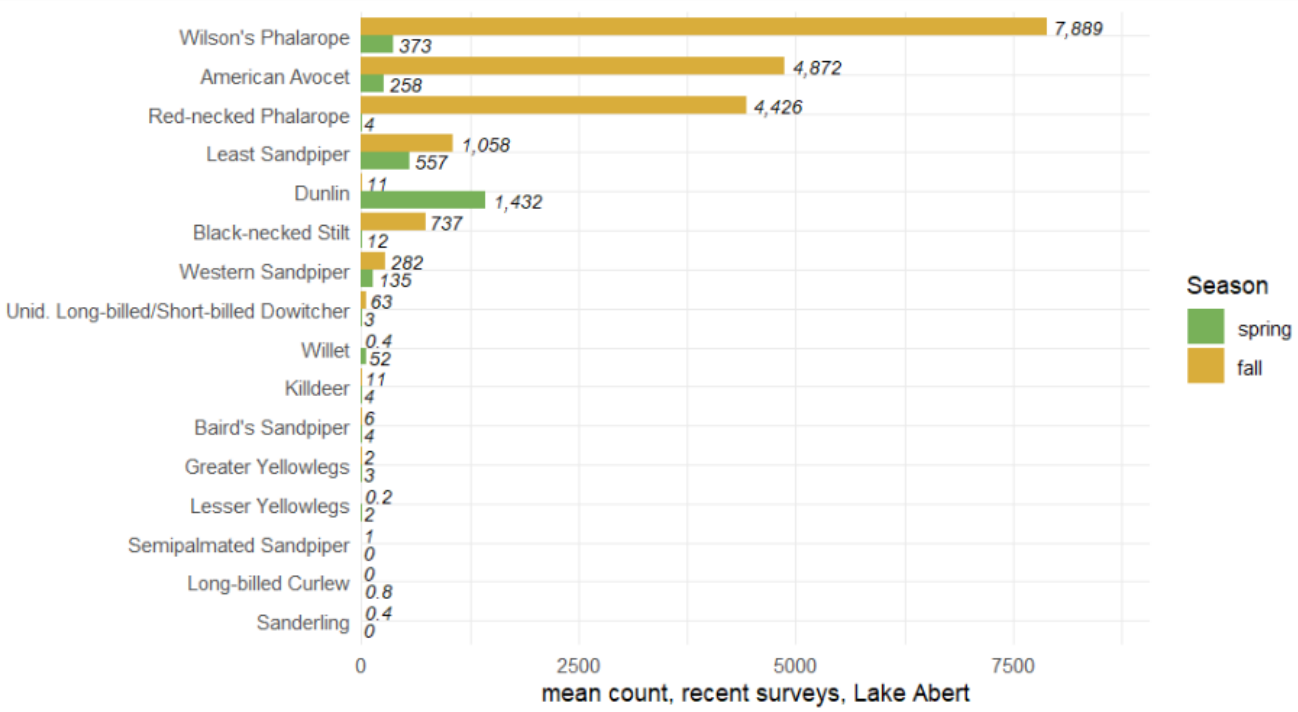
Chewaucan Marshes

- County: Lake County, Oregon
- Location (latitude, longitude): 42.64000, -120.28000
- Salinity: Fresh to brackish marsh complex
- Basin: Chewaucan–Lake Abert Closed Basin
- HUC4: 171200
- Water managers: BOR (historical project lands), USFWS, private irrigators
- Ownership: Highly fragmented—includes private flood-irrigated hay meadows, federal conservation easements, and limited federal ownership (BLM, USFWS).
- Conservation partnerships:
    - Partnership for Lake Abert and the Chewaucan (PLACe): https://oregonconsensus.org/projects/partnership-for-lake-abert-and-the-chewaucan-place/
    - Lake County Umbrella Watershed Council https://lakecountywsc.com/
- Historic shorebird site: No

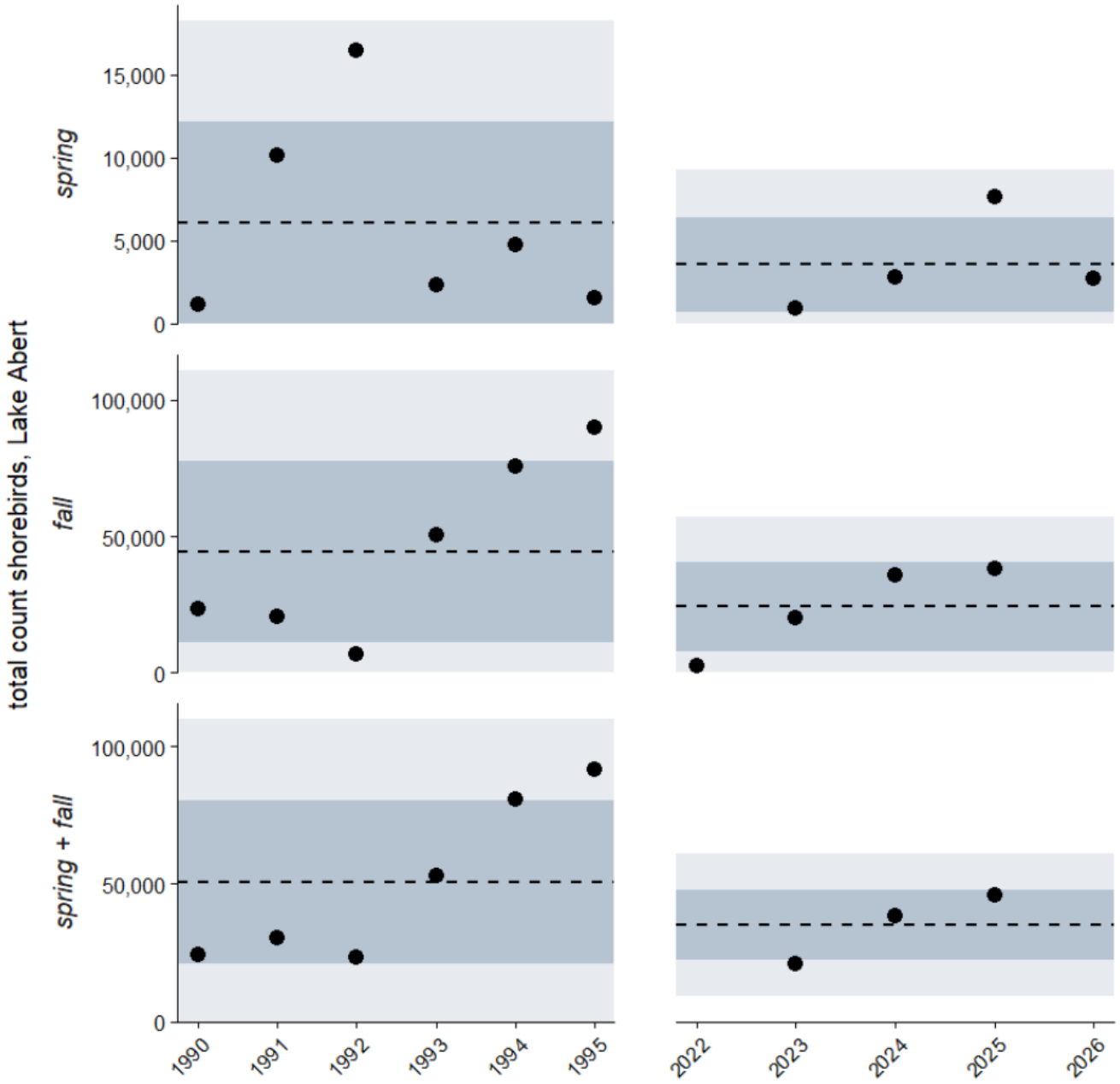


Lake Abert

- County: Lake County, Oregon
- Location (latitude, longitude): ~42.65000, -120.20000
- Basin: Chewaucan–Lake Abert Closed Basin
- HUC4: 171200
- Salinity: Hypersaline (typically 75 g/L, rising >250 g/L under drought) Larson et al. 2016
- Ownership: State and Private
- Water managers: OWRD, private irrigators
- Conservation partnerships:
    - Partnership for Lake Abert and the Chewaucan (PLACe): https://oregonconsensus.org/projects/partnership-for-lake-abert-and-the-chewaucan-place/
    - Lake County Umbrella Watershed Council: https://lakecountywsc.com/
- Historic shorebird site: Yes

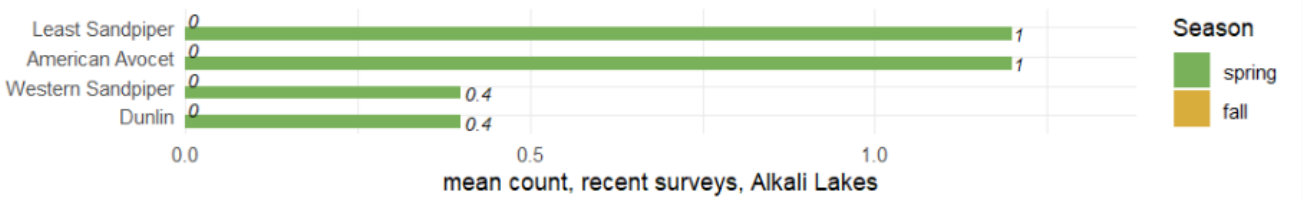


Lake Abert (continued)



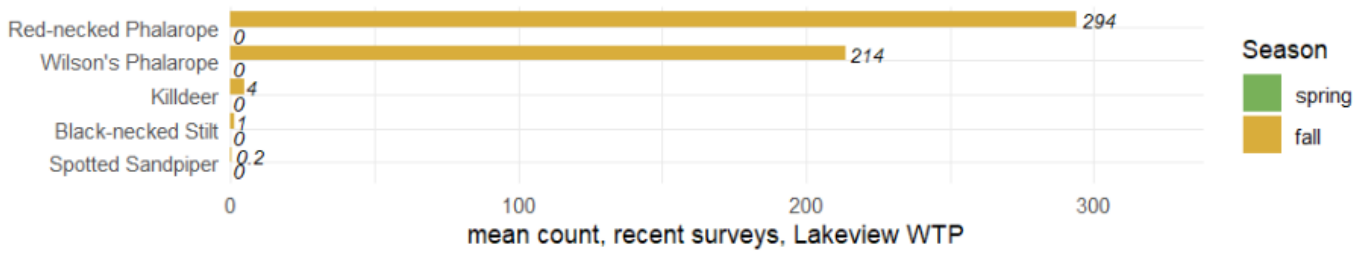
Alkali Lakes (north of Lake Abert)

- County: Lake County, Oregon
- Location (latitude, longitude): 42.78000, -120.10000
- Basin: Chewaucan–Lake Abert Closed Basin
- HUC4: 171200
- Salinity: Hypersaline / alkali playa lakes (seasonally dry)
- Ownership: Federal (BLM) and private
- Water managers: OWRD, BLM, private water right holders.
- Conservation partnerships:
    - Partnership for Lake Abert and the Chewaucan (PLACe): https://oregonconsensus.org/projects/partnership-for-lake-abert-and-the-chewaucan-place/
    - Lake County Umbrella Watershed Council: https://lakecountywsc.com/
- Historic shorebird site: Yes (single survey)



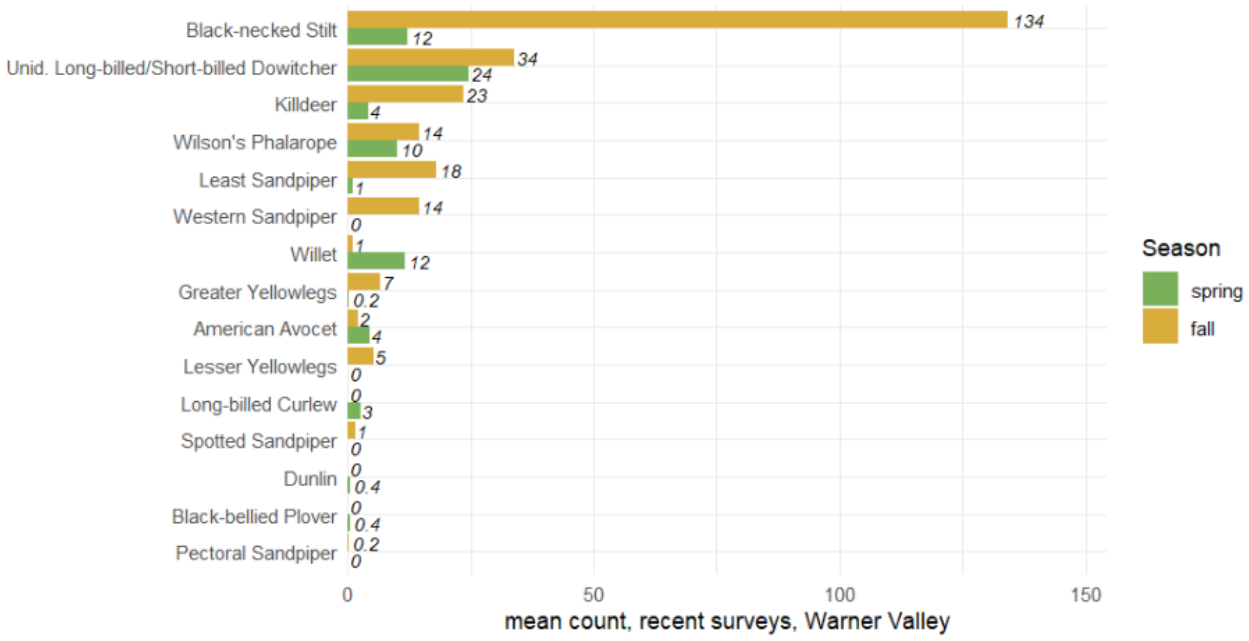
Lakeview WTP (wastewater treatment plant)

- County: Lake County, Oregon
- Location (latitude, longitude): 42.19000, -120.35000
- Basin: Goose Lake Basin
- HUC4: 180200
- Salinity: Freshwater, nutrient-enriched
- Ownership: Municipal (City of Lakeview)
- Water managers: City of Lakeview
- Conservation partnerships:
    - Lake County Umbrella Watershed Council: https://lakecountywsc.com/
- Historic shorebird site: Yes

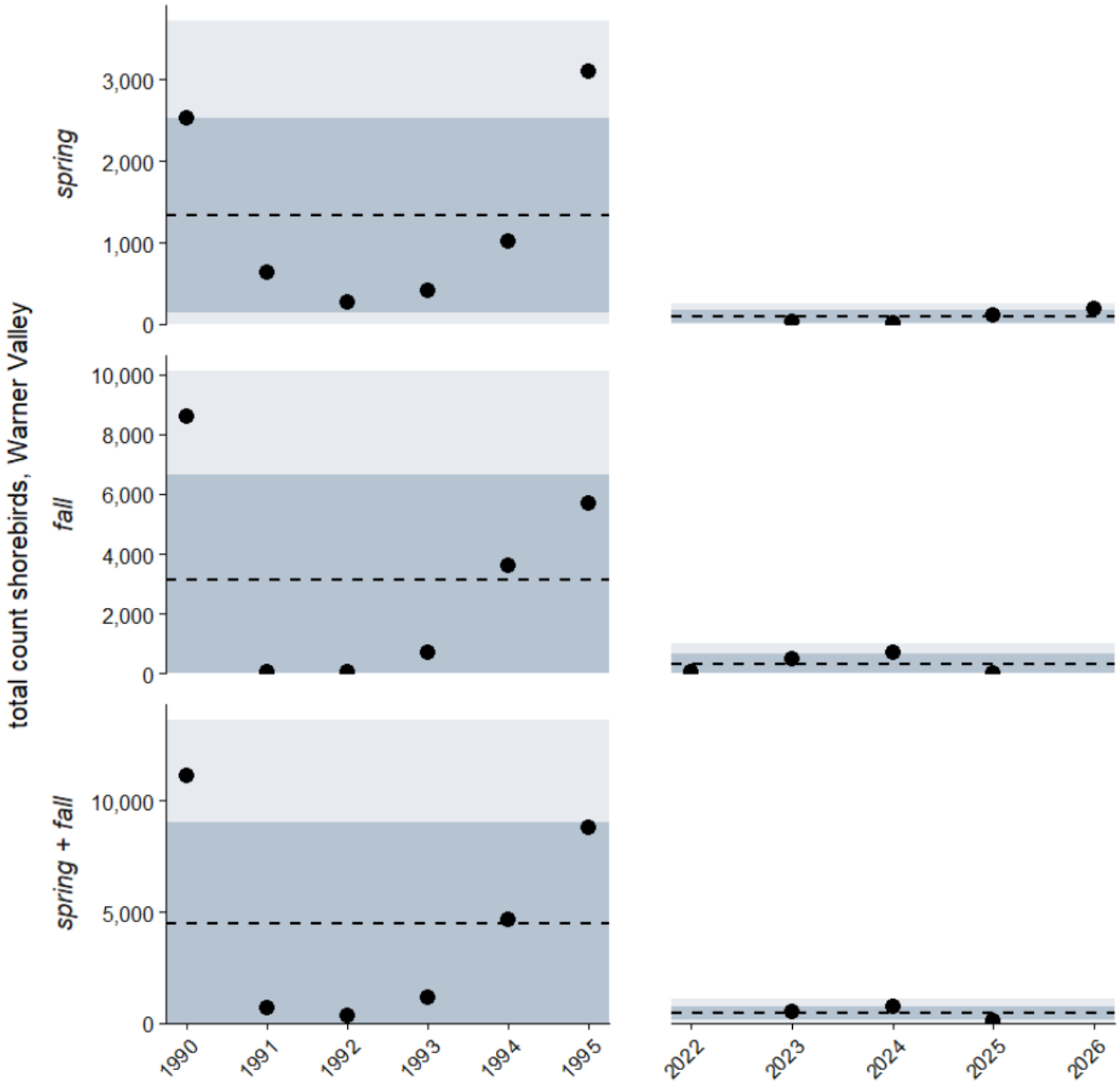


Warner Valley (Warner Lakes system)

- County: Lake County, Oregon
- Location (latitude, longitude): 42.20000, -119.90000
- Basin: Warner Lakes Basin
- HUC4: 171200
- Salinity: lakes range from freshwater to hypersaline
- Ownership: BLM and private
- Water managers: BLM, OWRD, private irrigators
- Conservation partnerships:
    - Lake County Umbrella Watershed Council https://lakecountywsc.com/
- Historic shorebird site: Yes

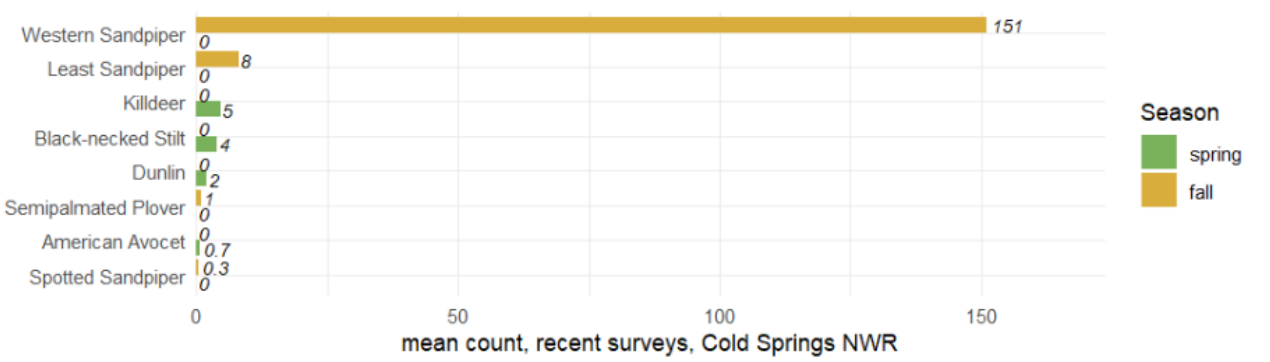


Warner Valley (continued)



Cold Springs NWR (National Wildlife Refuge)

- County: Umatilla County, Oregon
- Location (latitude, longitude): 45.86370, -119.14950
- Basin: Umatilla / Columbia River Basin
- HUC4: 170701
- Salinity: Freshwater wetlands
- Ownership: Federal (USFWS)
- Water managers: USFWS, BOR, private irrigators
- Conservation partnerships: only broader Columbia Basin agreements.
    - Resilient Columbia Basin Agreement (cancelled in 2025)
- Historic shorebird site: No



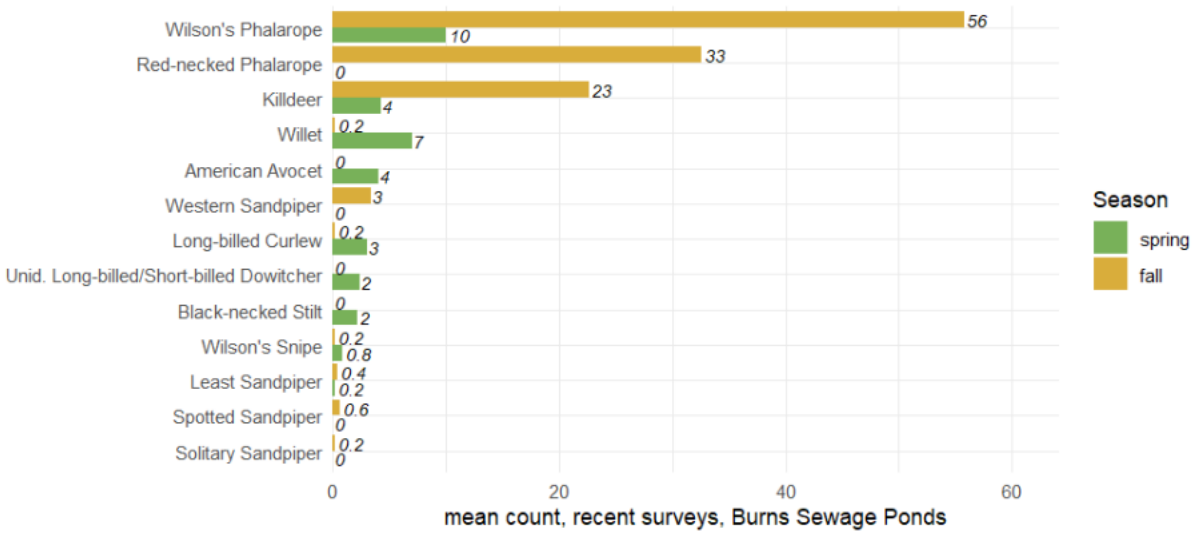
Umatilla NWR

- County: Umatilla County, Oregon
- Location (latitude, longitude): 45.92000, -119.27000
- Basin: Columbia River Mainstem
- HUC4: 170701
- Salinity: Freshwater wetlands (Columbia River system)
- Ownership: Federal (USFWS)
- Conservation partnerships: only broader Columbia Basin agreements.
    - Resilient Columbia Basin Agreement (former)
- Historic shorebird site: No

NOTE: No bar graph is shown because there were no shorebirds detected in the recent survey rounds at the site.

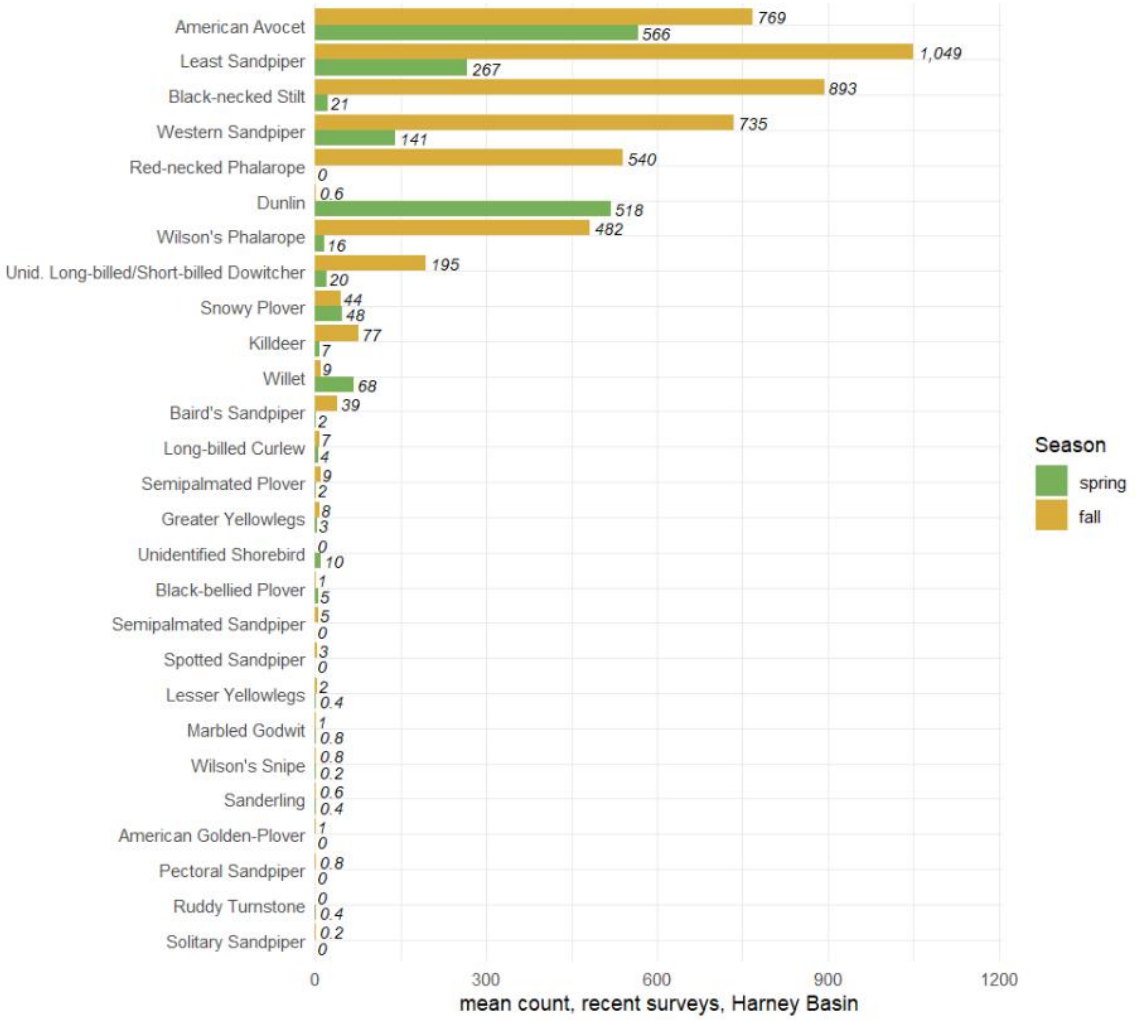
Burns Sewage Ponds

- County: Harney County, Oregon
- Location (latitude, longitude): 43.59000, -119.05000
- Basin: Harney Basin Closed Basin
- HUC4: 171200
- Salinity: Freshwater / nutrient-rich wastewater ponds
- Ownership: Municipal (City of Burns)
- Water managers: City of Burns
- Conservation partnerships:
    - Harney Basin Wetlands Collaborative https://harneywetlandscollaborative.org/
    - High Desert Partnership: https://highdesertpartnership.org/
- Historic shorebird site: Yes (single survey)

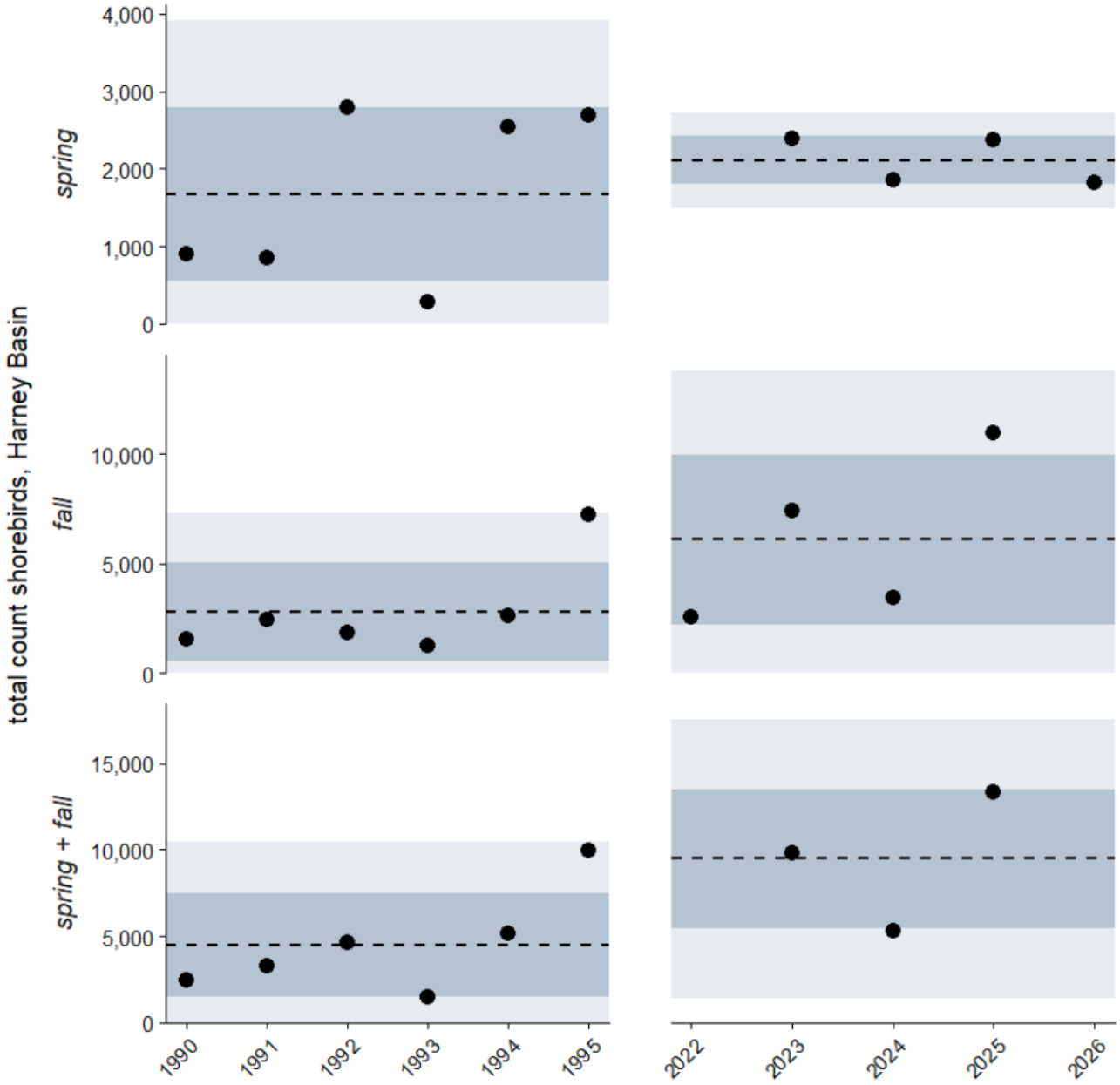


Harney Basin

- County: Harney County, Oregon
- Location (latitude, longitude): 43.40000, -118.80000
- Basin: Harney Basin Closed Basin
- HUC4: 171200
- Salinity: Mixed wetlands, freshwater to alkaline)
- Ownership: Mixed Federal, State, and Private
- Water managers: USFWS, BLM, OWRD, private irrigators
- Conservation partnerships:
    - Harney Basin Wetlands Collaborative: https://harneywetlandscollaborative.org/
    - High Desert Partnership: https://highdesertpartnership.org/
    - Friends of Malheur National Wildlife Refuge: https://malheurfriends.org/
- Historic shorebird site: Yes

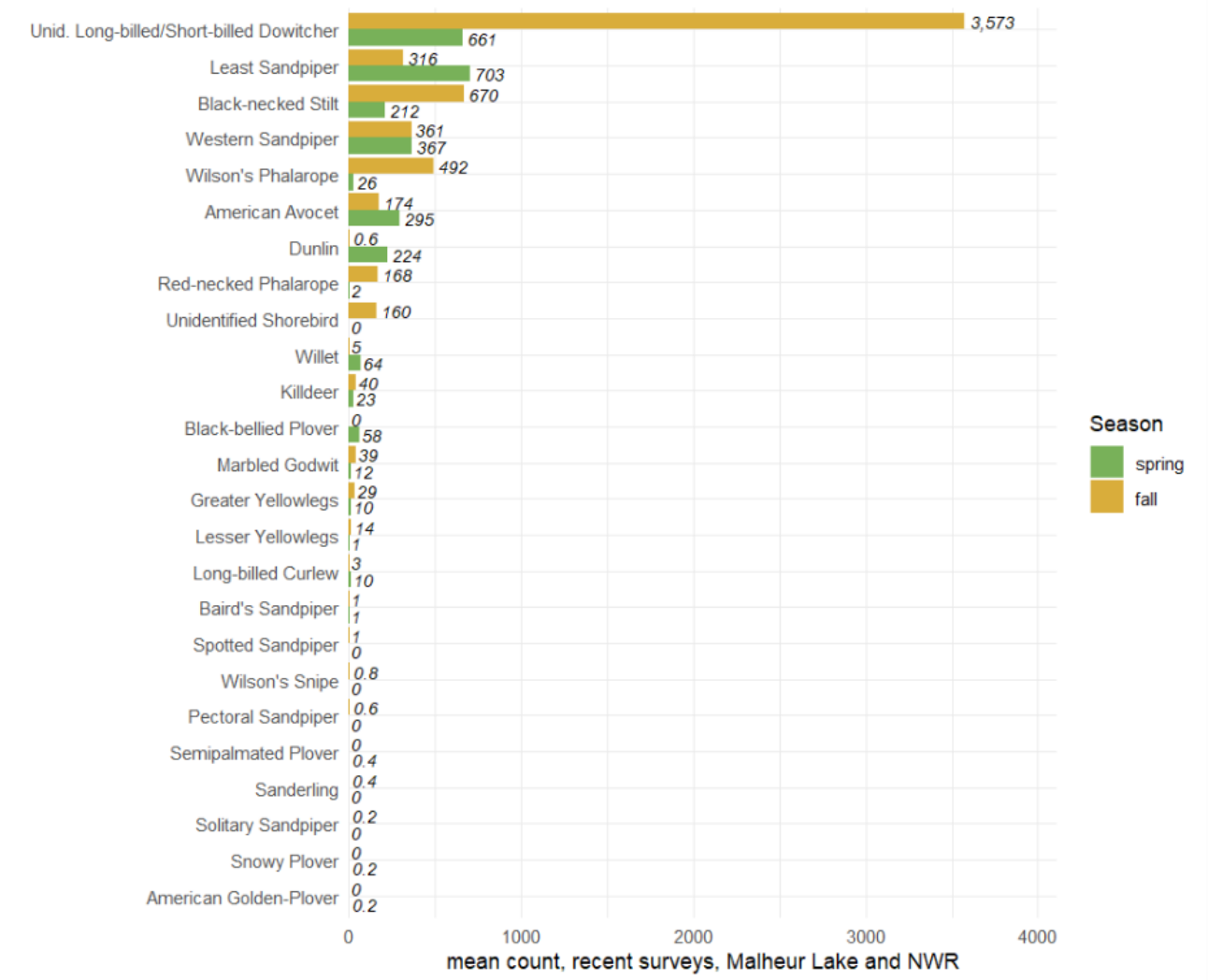


Harney Basin (continued)

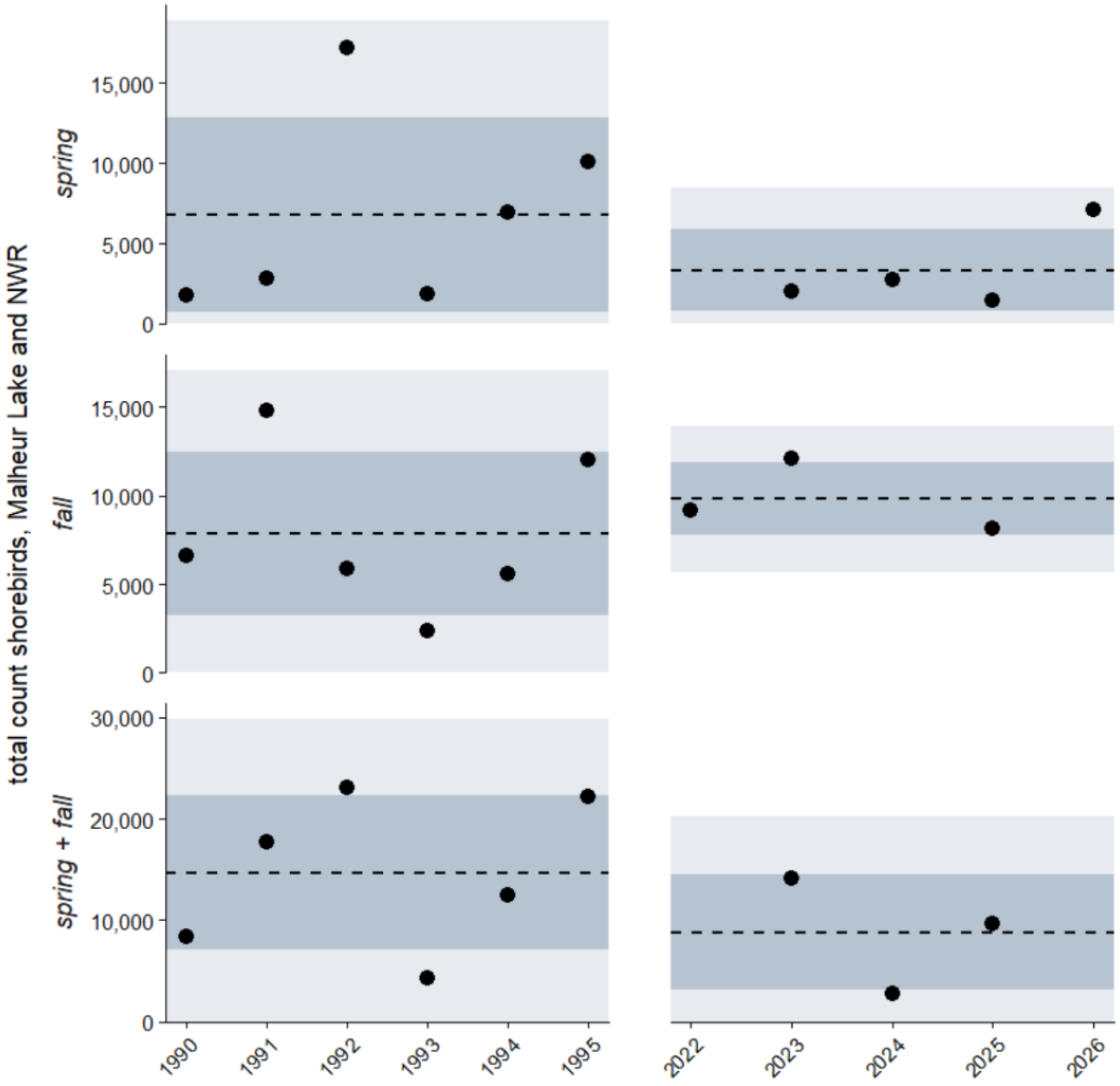

total count shorebirds, Harney Basin
spring
fall
spring + fall
4,000
3,000
2,000
1,000
0
10,000
5,000
15,000
1990
1991
1992
1993
1994
1995
2022
2023
2024
2025
2026

Malheur Lake

- County: Harney County, Oregon
- Location (latitude, longitude): 43.30000, -118.80000
- Basin: Harney Basin Closed Basin
- HUC4: 171200
- Salinity: Freshwater to moderately saline (variable)
- Ownership: Federal (USFWS dominant) and private
- Water managers: USFWS, BLM, OWRD, private irrigators
- Conservation partnerships:
    - Harney Basin Wetlands Collaborative: https://harneywetlandscollaborative.org/
    - High Desert Partnership: https://highdesertpartnership.org/
    - Friends of Malheur National Wildlife Refuge: https://malheurfriends.org/
- Historic shorebird site: Yes

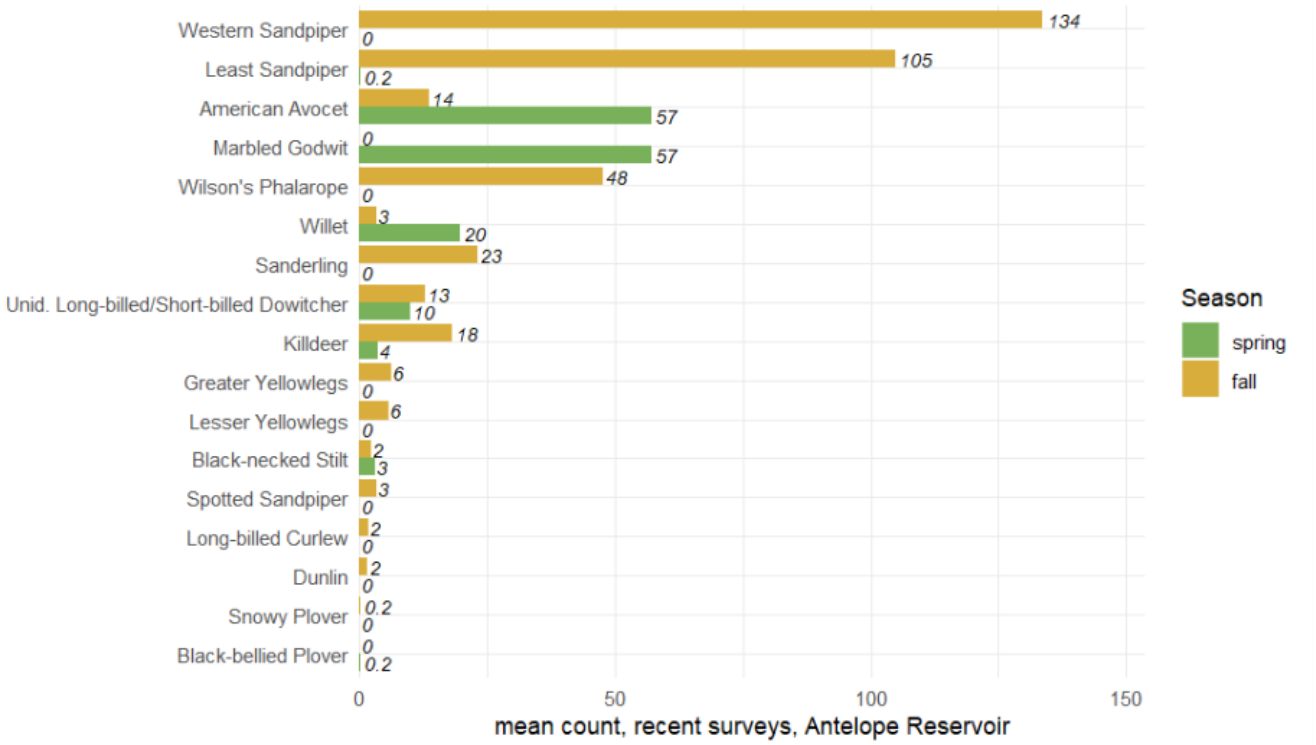


Malheur Lake (continued)



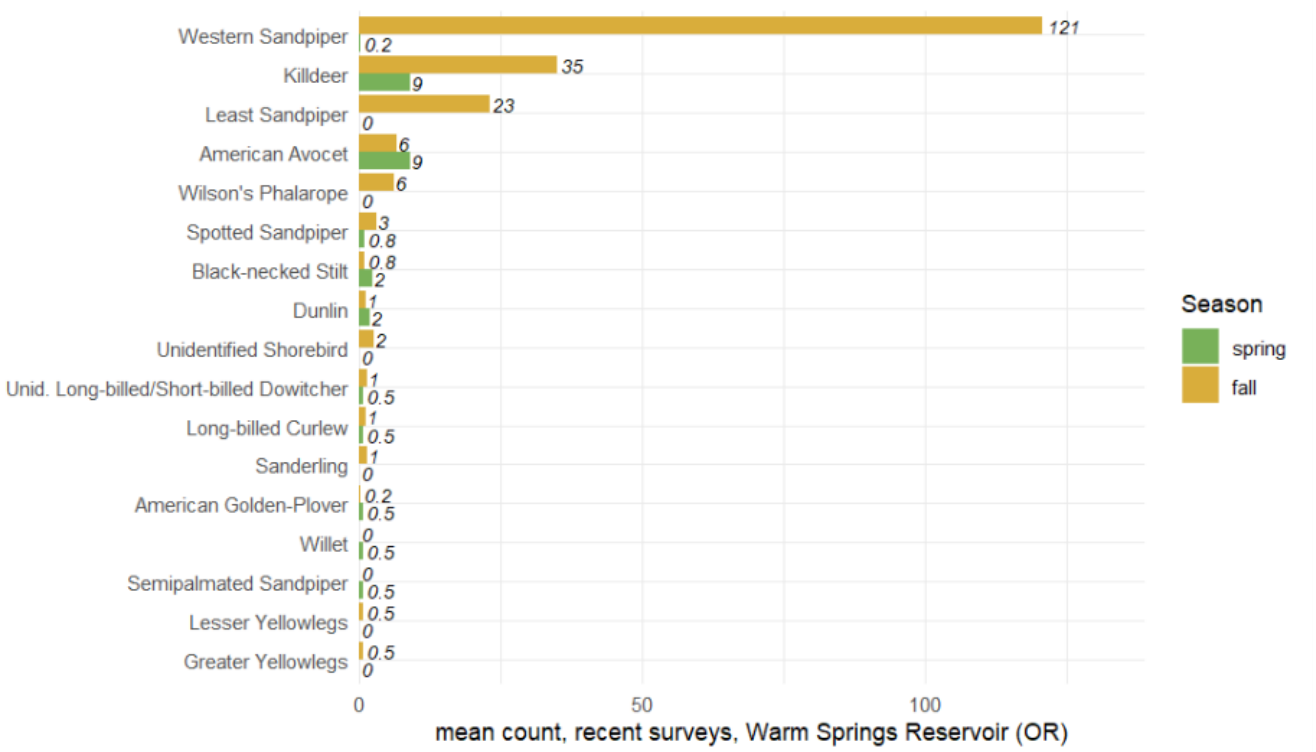
Antelope Reservoir

- County: Malheur County, Oregon
- Location (latitude, longitude): 44.25000, -118.57000
- Basin: Malheur River Basin
- HUC4: 170501
- Salinity: Freshwater
- Ownership: Federal infrastructure (dam and reservoir) owned by Bureau of Reclamation; operated by Vale Oregon Irrigation District under contract; surrounding lands include a mix of federal (BLM/BOR) and private agricultural lands.
- Water managers: BOR, Vale Oregon Irrigation District
- Conservation partnerships:
    - Malheur Watershed Council https://www.malheurwatershed.com/
- Historic shorebird site: Yes (single survey)



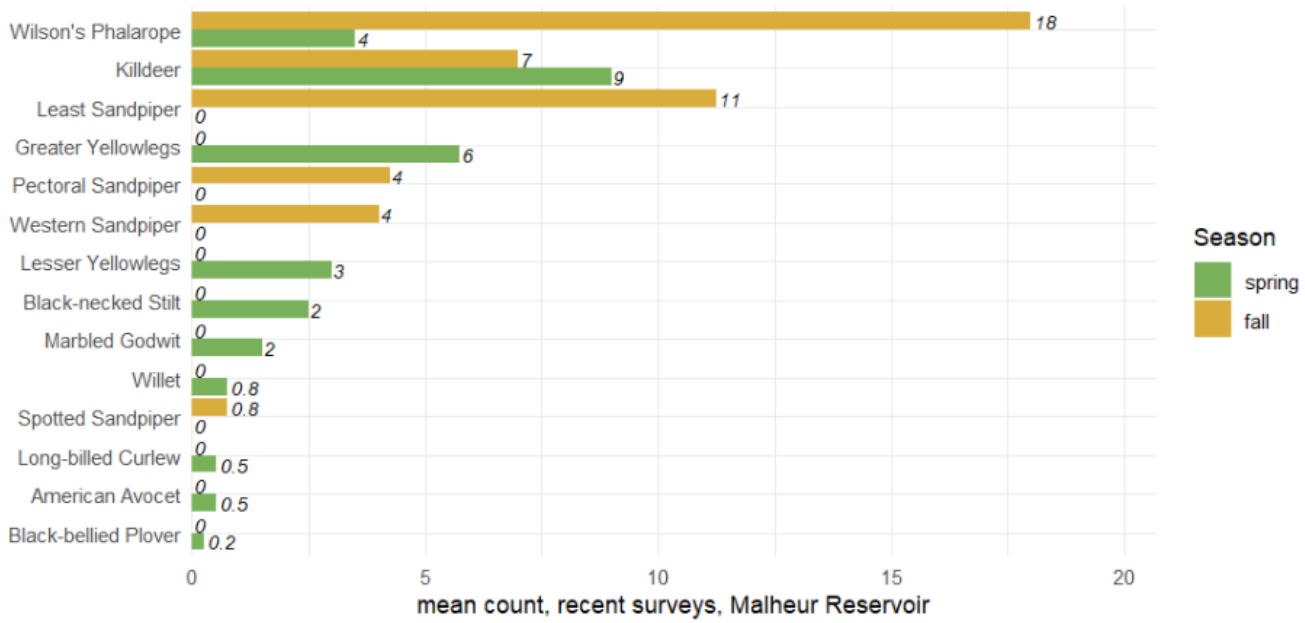
Warm Springs Reservoir

- County: Malheur County, Oregon
- Location (latitude, longitude): 43.57000, -117.95000
- Basin: Owyhee River Basin
- HUC4: 170501
- Salinity: Freshwater
- Ownership: Federal (BOR)
- Water managers: BOR, Owyhee Irrigation District
- Conservation partnerships:
    - Owyhee Watershed Council
    - Malheur Watershed Council https://www.malheurwatershed.com/
- Historic shorebird site: Yes (single survey)



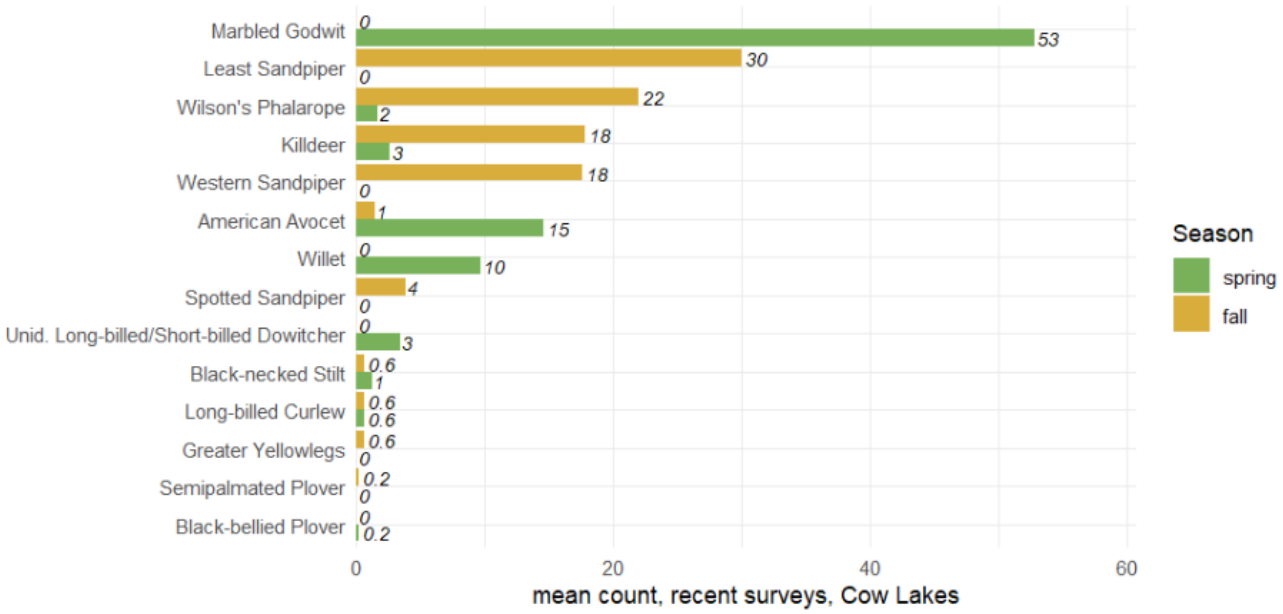
Malheur Reservoir

- County: Malheur County, Oregon
- Location (latitude, longitude): 44.20000, -117.73000
- Basin: Malheur River Basin
- HUC4: 170501
- Salinity: Freshwater
- Ownership: BLM and private
- Water managers: Bureau of Land Management, local irrigation users
- Conservation partnerships:
    - Malheur Watershed Council https://www.malheurwatershed.com/
- Historic shorebird site: Yes (single survey)



Cow Lakes

- County: Malheur County, Oregon
- Location (latitude, longitude): 44.07000, -117.62000
- Basin: Malheur River Basin
- HUC4: 170501
- Salinity: Seasonal freshwater to brackish playas
- Ownership: BLM and private
- Water managers: BLM, private landowners
- Conservation partnerships:
    - Malheur Watershed Council https://www.malheurwatershed.com/
- Historic shorebird site: Yes



Bully Creek Reservoir

- County: Malheur County
- Location (latitude, longitude): 43.98000, -117.36000
- Basin: Malheur River Basin
- HUC4: 170501
- Salinity: Freshwater
- Ownership: Federal (BOR) owns dam and storage facility; operations delegated to Vale Oregon Irrigation District; shoreline lands include county parks plus federal and private parcels.
- Water Managers: BOR, Vale Oregon Irrigation District
- Conservation Partnerships:
    - Bully Creek Watershed Association
    - Malheur Watershed Council: https://www.malheurwatershed.com/
- Historic shorebird site: Yes (single survey)

