

Phalaropes and Saline Lakes Program 2023 Report



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Cover photo: A male Wilson's phalarope tagged with a Motus nanotag at Chaplin Lake, Saskatchewan, Canada. Photo by Ryan Carle.

Summary

2023 marks the fifth year of Oikonos' phalaropes and saline lakes program. The program's goal is to identify phalarope and saline lake conservation needs through science and education, and to use the story of phalaropes to advance urgently needed conservation of saline lakes hemisphere-wide. This year, major achievements included:

- **Tagging 25 Wilson's phalaropes in Canada and California** with partners to better understand phalarope movements, how long they stay at saline lakes, and connections between breeding sites, migratory sites, and wintering sites. This first-ever tracking data on the species **has already provided many new insights** into their habitat needs.
- Completion of the **5th consecutive year of regionally coordinated phalarope surveys at 6 major North American phalarope staging sites**. Oikonos has led Mono Lake surveys since 2019 and organizes coordination with partners' surveys at the other sites.
- **Leading the Intermountain West Shorebird Survey for sites in the Eastern Sierra**, part of a collaborative regional project with National Audubon and Point Blue Conservation Science to survey shorebirds throughout the western U.S.
- **Helping host the first-ever Mono Lake Phalarope Festival in Lee Vining**, attended by approximately 120 people, including eight visitors who work on phalarope conservation in South America.
- **Dedicating three new phalarope murals in Lee Vining** painted by Argentinian artist Franco "Vato" Cervato.
- Making significant advancements in outreach and education, including **class visits from Lee Vining public school kids to see the phalarope murals, international educational exchange events with Argentinian youth**, public talks, and many news articles.

Land Acknowledgement

Mono Lake (originally named Kootzapa'a) is the unceded homelands of the Kootzaduka'a Paiute tribe. You can support the Kootzaduka'a's efforts to gain federal recognition and return of land, and to steward the lands of the Mono Basin by donating to the Mono Lake Kutzaduka Indian Community Cultural Preservation Association, P.O. Box 237, Lee Vining, CA 93541. You can learn about the culture, history, and current tribal activities by visiting [their website](#).



Kootzapa'a, homeland of the Kootzaduka'a.

Part 1: Scientific results

An in-depth regional scientific report is forthcoming; here is a summary of the highlights of preliminary results from 2023.

Phalarope tagging in Canada and California

A long-standing goal we have worked toward is tagging phalaropes to better understand their movements, connectivity between important habitats, and how long individuals stay at saline lakes. In early June, Ryan and Kiki traveled to Saskatchewan, Canada to work with Environment and Climate Change Canada (ECCC) to tag Wilson's phalaropes at their breeding grounds. Work in Canada will form part of MSc student Sydney Miller's thesis (Thompson Rivers University) and is being supervised by Dr. Ann McKellar (ECCC). We trapped male Wilson's phalaropes on their nests using a remote-controlled bow net and attached Lotek NanoTags, a lightweight radio transmitter tag weighing about as much as a paper clip, by gluing them to the nape of the bird (see cover page photo of a male from Saskatchewan with a tag). We targeted males because after female phalaropes lay their eggs, the males exclusively take care of the eggs and chicks and are therefore easier to trap on the nest. These tags will be detected by Motus towers throughout the bird's migration route. We successfully tagged 15 Wilson's phalaropes in Canada and their movement has already been picked up by Motus towers in the western United States (Fig. 1). 10 of the Nanotags deployed in Canada were funded by a grant from University of Connecticut through Dr. Margaret Rubega.



The tagging team at Chaplin Lake, Saskatchewan. Left to right Ryan Carle (Oikonos), Ann McKellar (ECCC), Gill Holmes (ECCC), Kiki Tarr (Oikonos), and Sydney Miller (ECCC & Thompson Rivers University).

In July and August, we attempted to capture phalaropes at Mono Lake to tag them with CTT Lifetags, which are detected by the Motus network receivers and have a solar panel for a longer tag lifespan. We worked with collaborators Dr. Margaret Rubega (University of Connecticut), USGS Western Ecological Research Center, and MSc student Sydney Miller, with boat assistance from California State Parks and the Mono Lake Committee. At Mono Lake catching phalaropes was difficult because they are on the water and not tied to their nest. At first, we tried capturing phalaropes in the daytime by targeting birds that were too fat to quickly take off from the water, but we were not successful because no birds were too heavy to fly. After a week of trial and error, we had success capturing phalaropes from boats on dark nights by confusing them using a bright spotlight. We captured two red-necked phalaropes this way but did not tag them because the tag attachment method (which we had planned around tagging Wilson's phalaropes) did not fit red-necked phalaropes properly. At that point there were few Wilson's phalaropes still at Mono Lake, and our efforts needed to be wrapped up for staff and equipment reasons. However, our development of capture methods at Mono Lake resulted in success at Tule Lake in northern California, where our colleagues from USGS subsequently deployed tags on 10 Wilson's phalaropes. Five of these tags were our CTT Lifetags from the Mono Lake effort, and the other five tags were solar-powered Lotek Sunbird satellite tags that transmit more frequent data of the phalarope's location using satellites (Fig. 1).

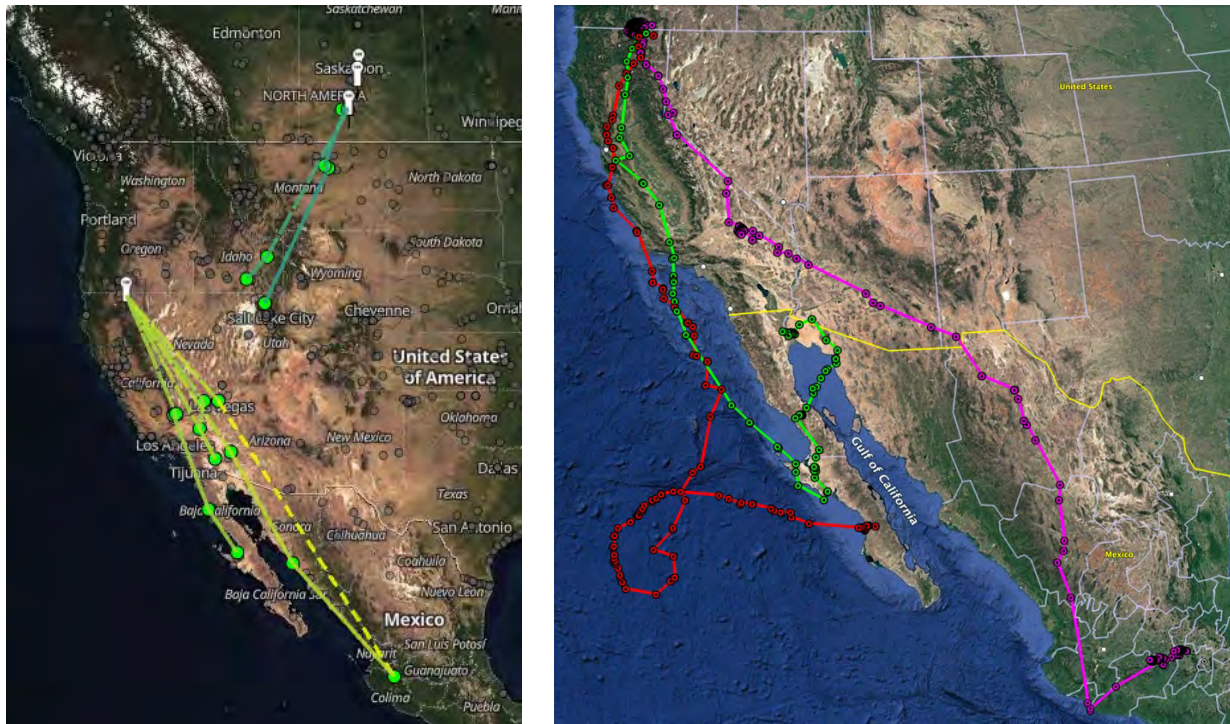


Fig. 1. Maps of data collected to date (November 2023) from Wilson’s phalaropes tagged with Motus tags in Saskatchewan and California (left panel) and satellite tags in California (right panel). On the Motus map (left), dots indicate detections by a Motus tower. Dark green lines are tracks from tags deployed in Canada, lighter green/yellow lines are from tags deployed in California, and grey dots represent MOTUS towers. On the satellite tags map (right), each colored line represents the track from a different bird, with points indicating exact locations from satellite transmission. Motus data are from Oikonos, Dr. Margaret Rubega, Environment & Climate Change Canada, & USGS, and satellite tags data are from USGS. Motus tracks are updated whenever detections occur and are viewable at: <https://motus.org/dashboard/#e=profile&d=species&s=4990>

As of October 2023, results from the 25 tagged birds have already shed new light on phalarope migration stops and strategies. Highlights include a bird from Canada arriving at Great Salt Lake, and birds tagged in California making stops at wetlands in southern California, Baja California and central Mexico (Fig. 1). None of the sites in Mexico were previously recognized by scientists as important for migrating Wilson’s phalaropes. Also, the pattern of a southward migration punctuated by multiple stops (Fig. 1) is distinct from the expected non-stop migration to South America that has long been the assumed strategy of the species. These results are preliminary, and our sample is small, but it is already clear that tagging will reveal much previously unknown information about phalarope conservation needs.

2023 Phalarope survey results

Phalarope surveys at Mono Lake cover 59 boat and 7 shore-based points, each with a fixed count boundary. We do 12 surveys a year, from late June to mid-September. These surveys are “index counts”, meaning we compare numbers year to year at the points we cover, rather than trying to produce an absolute number of all phalaropes on the lake (see [Carle & Rubega 2020](#) and [Carle et](#)

[al. 2023](#) for full survey methods and results). However, results from the index survey should be representative of overall population trends at Mono Lake.

In 2023, the high count of Wilson's phalaropes was 6,255 (359 SD) on July 4th, and of red-necked phalaropes was 32,699 (122 SD) on August 28th. The 2023 peak for Wilson's phalaropes was almost half as many as the 2022 peak and significantly less than the 2021 peak. For red-necked phalaropes, the 2023 peak was a record high, almost three times as many as in any other year from 2019-2022 and more than 10,000 birds higher than the published single-day count record from Mono Lake (21,613 on August 30th 1976, Winkler 1977).

Phalarope timing

In 2023, Wilson's phalarope peak numbers occurred in early July (Fig. 2), unlike peak numbers in 2021 and 2022 which occurred in mid-July (Fig. 2). In the 1980s, Wilson's phalarope peaks were more often in early August (Jehl 1988). This is the first year of our study that Wilson's phalarope numbers peaked during the earliest survey window from late June-early July.

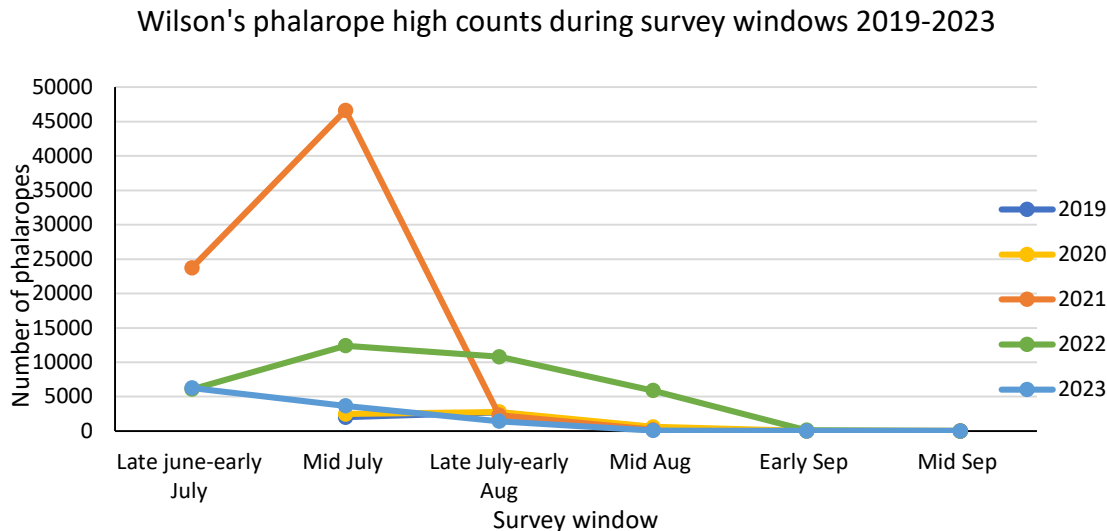


Fig. 2. Wilson's phalarope high counts from each survey window 2019-2023. We do two counts during each survey window; the highest count from each window is shown here.

Red-necked phalarope peak counts occurred in early September (Fig. 3). We counted over 20,000 red-necked phalaropes on surveys from mid-August through mid-September. This was unusual because in previous years our maximum red-necked phalarope counts had been closer to 10,000 birds. Unusually large numbers of red-necked phalaropes were also reported from other locations this year, including the Salton Sea. Red-necked phalarope individuals arrive and depart from Mono Lake more frequently than Wilson's, and their numbers often vary with less of a clear peak timing than Wilson's (Fig. 3., Jehl 1986).

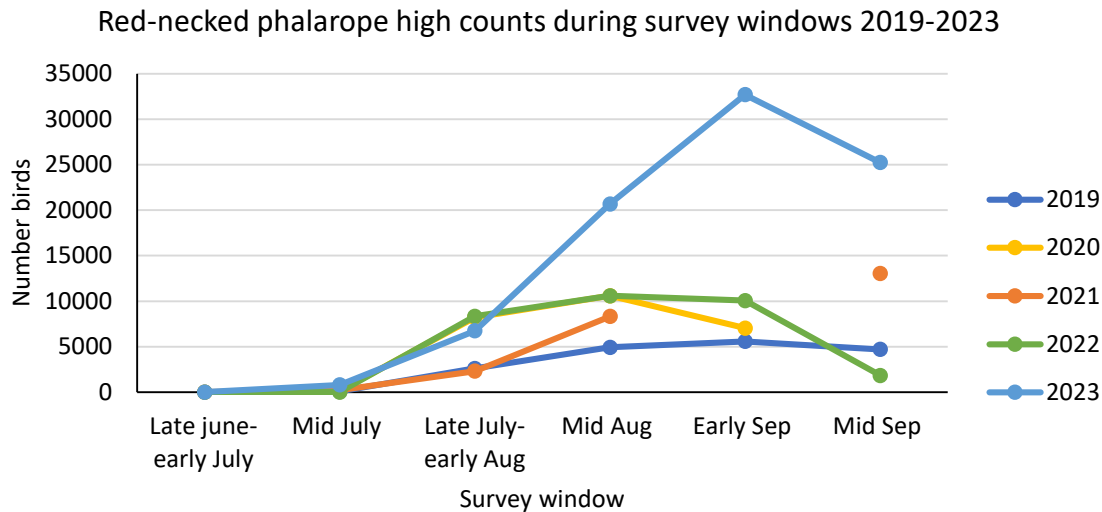


Fig. 3. Red-necked phalarope high counts from each survey window 2019-2023. We do two counts during each survey window; the highest count from each window is shown here.

Phalarope spatial use of Mono Lake

In 2023, both Wilson’s and Red-necked phalaropes congregated on the northeastern side of the lake and in the open waters east of Negit Island. Thousands of Wilson’s phalaropes were present at Lee Vining Tufa in July before shifting to the eastern lake later in the summer. In September, hundreds of red-necked phalaropes were observed at Old Marina and South Tufa. Shifts in phalarope distribution in 2023 are likely related to the rising lake level, which rose nearly 4 vertical feet from 6,379.7 feet elevation in June 2022 to 6,382.9 in August 2023 (Mono Lake Committee, unpublished data).



Wilson’s phalaropes at Lee Vining tufa, where the rising lake level created new shallowly submerged tufa, and more flies to eat! Photo by David Carle.

Coordinated phalarope counts from other sites in Western North America

A critical piece of the interpretation of phalarope results from Mono Lake is putting them in context with other major western North American staging sites. Since 2019, we have collaborated with partners at Great Salt Lake, Lake Abert, Owens Lake, San Francisco Bay, and

Chaplin Lake to evaluate overall phalarope trends and timing (Carle *et al.* 2023). Each site is surveyed during the same week-long survey windows and the totals are added to determine the window that had the highest total number of each species (Fig. 4). This big-picture look shows a potentially declining trend in total Wilson's and red-necked numbers across the staging sites since 2019, with especially low numbers in 2020 and 2022 (Fig. 4). Data from 2023 has not been processed yet but will be reflected in our 2023 regional report. See [Carle et al. 2023](#) for full methods and results of regional surveys 2019-2022.

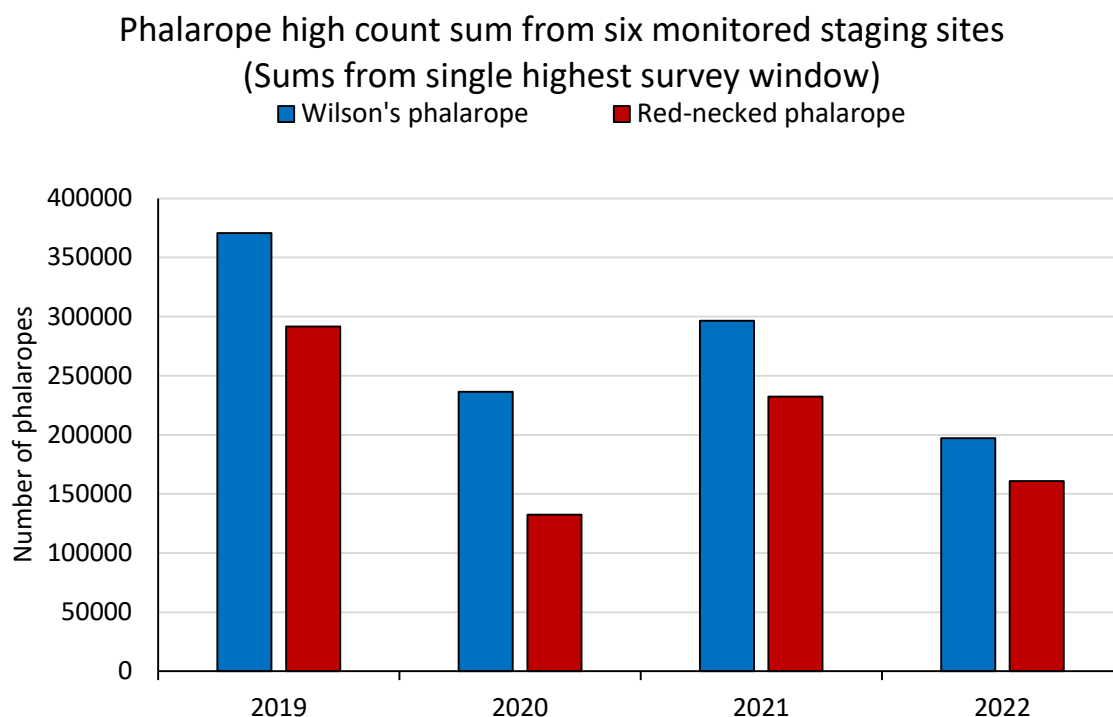


Fig. 4. Phalarope count totals from the six monitored staging sites in western North America from 2019 to 2022. Sums are the highest count during a single survey window. Totals are combined totals of birds identified to species and unidentified birds on the same date. For red-necked phalaropes, we used the greatest red-necked/unidentified combined total from mid-August on. Full regional survey results are in [Carle et al. 2023](#).

These big-picture trends and habitat use data generated from coordinated surveys are useful for understanding phalaropes' responses to rapid habitat changes at North American saline lakes. Great Salt Lake was on the edge of ecological collapse in 2022 when the lake level was at a record low ([New York Times, 2022](#)). This caused exposure of microbialite rocks that are habitat for flies and increased the salinity of the lake to levels detrimental to the survival and reproduction of brine shrimp and brine flies (<https://webapps.usgs.gov/gsl/#salinity>; Null & Wurtsbaugh 2020). Preliminary reports from summer 2022 indicated decreases in fly populations at GSL, and that the flies that were present were small and stunted ([Larsen 2022](#)). Lake Abert, in Oregon, meanwhile, had been virtually completely dried up since 2021 ([Hall et al. 2023](#)). Water levels at both Great Salt Lake and Lake Abert recovered after the record amounts of precipitation in winter 2022-2023. However, rises in 2023 may only be a short-term buffer before the state of each lake becomes dire again, given that the issues with water diversion have not been solved at

those lakes. The situation at these two sites highlights the outsized importance of Mono Lake, which has its own water right and is relatively stable, as a refuge for phalaropes and other waterbirds. However, Mono Lake ecological health also remains precarious—in October 2023, Mono Lake’s water level was 6,383’, eight vertical feet below the legally mandated target water level of 6,392’ set in 1994.

Phalarope Disturbance Study

In 2023, we completed the second year of our phalarope and osprey disturbance study at western South Tufa. This study was created due to past observations of human disturbance to large flocks of phalaropes and nesting osprey at South Tufa. We investigated the type, frequency, and magnitude of bird disturbances by humans in this area by observing bird and human interactions twice a week for a three-hour period with a spotting scope from Test Station Road. The study began in late June and ended in early September on Labor Day.

In 2023, we did not observe any phalaropes using western South Tufa. We did, however, observe nine disturbances to nesting osprey caused by pedestrians and boaters. There were 38 human visitation events during our 2023 study. The most common type of visitation to the area was by kayaks (50% of visits). On average, Ospreys that flushed did so when a boat approached within 9.2 ± 8.5 meters from the bird. In some cases, boaters approached closely to osprey nests but the birds were not disturbed. After two years of data collection, we have found that phalarope and osprey disturbance was infrequent in western South Tufa, and that osprey were disturbed by the approach of boats less frequently than expected. We recommend continued outreach to boaters about not disturbing birds, and adaptive management of disturbance of phalaropes and osprey at South Tufa. Dynamically changing lake levels of the area appear to cause different habitat use by birds, and different amounts of human disturbance, in different years.

Part 2: Community involvement, outreach, capacity building, & early-career scientist training

This year, we continued engagement with the local community via a Phalarope Festival, volunteer opportunities, and educational outreach. These volunteer opportunities provide a way for locals to participate in community science and deepen their connection with the Mono Basin.

Volunteers

In 2023, 35 volunteers helped with phalarope shore surveys and an all-species shorebird survey of Mono Lake’s entire shoreline (Table 1). This is the second year of volunteer participation in the survey as part of the Intermountain West Survey project. Of our 35 volunteers, 17 were full-time Eastern Sierra residents including staff of local organizations and agencies such as U.S. Forest Service, California State Parks, the Mono Lake Committee, and the Dechambeau Creek Foundation.

Table 1. Volunteer and job creation statistics, 2019-2023.

Year	Volunteer person-hours	Volunteer days	# volunteers	Paid local seasonal jobs created
2019	30	15	3	1
2020	53	8	7	1
2021	109	12	12	1
2022	279	12	32	1
2023	216	14	35	2
Total	687 total hours	61 total days	54 total volunteers (2019-2023)	5 years of paid seasonal jobs

Intermountain West Shorebird Survey



Volunteers during the spring and fall 2023 Intermountain West Shorebird Mono Lake surveys. We surveyed the entire shoreline of Mono Lake for all shorebird species on April 29th and August 19th, 2023.

This year, we continued to participate in the Intermountain West Shorebird Survey, leading surveys in the Eastern Sierra region, including Mono Lake and nearby sites. These surveys are in collaboration with Point Blue Conservation Science, the Audubon Saline Lakes program, and the Mono Lake Committee. The goal of these surveys is to understand the impact of extreme drought on shorebirds in the interior west by comparing data collected at these sites in the 1980s and 1990s to present-day data. With 40 miles of shoreline to be covered, we divided the shoreline into walkable sections and recruited many volunteers to ensure the job could be done. There were many challenges this year with completing the surveys. Record amounts of snowfall in the

winter made spring access difficult and led to the lake rapidly rising in the summer, making summer access difficult in some areas. Despite these challenges, we were able to successfully complete both surveys and engage many people in community science!

Education, outreach, and international collaboration

This summer, we made great strides in our goals of public education, outreach, and international collaboration. On June 18th, the first-ever Mono Basin Phalarope Festival took place at Hess Park in Lee Vining. The festival concluded the Mono Basin Bird Chautauqua, with a goal of celebrating and educating about human and saline lake connections made throughout the Wilson's phalarope migration. We hosted nine visiting researchers, park rangers, and conservationists from Laguna Mar Chiquita, Argentina, as well as visiting researchers from Great Salt Lake and San Francisco Bay. Organizations in attendance included Aves Argentinas, the Manomet (Western Hemisphere Shorebird Reserve Network Executive Office), Parque Nacional Ansenuza, San Francisco Bay Bird Observatory, Manomet, National Audubon Saline Lakes Program, and Sageland Collaborative. These guests attended and hosted Mono Basin Bird Chautauqua talks and spoke at the Phalarope Festival about conservation efforts at their saline lakes.



The crowd at the Phalarope Festival gathers in front of one of the phalarope murals.

Over 100 attendees were present at the festival. The festival commenced with the unveiling of three new Wilson's phalarope murals in Lee Vining. Muralist [Franco "Vato" Cervato](#) of Córdoba, Argentina came to Lee Vining to paint these murals after Mono Lake Committee and Oikonos staff visited Laguna Mar Chiquita last December and were inspired by a mural he had painted there depicting the Wilson's phalarope's migration. They decided Lee Vining needed a "sister" mural to celebrate the "sister saline lake" status of Mar Chiquita, Mono Lake, and Great Salt Lake. During his time in Lee Vining, Vato met with numerous school groups from Lee Vining to show them the murals and teach them about art, Argentina, and bird migrations. After painting in Lee Vining, Vato traveled to Salt Lake City to paint another saline-lake themed mural at Great Salt Lake.

The Phalarope Festival featured educational booths, local artists, music, a phalarope costume contest, and speakers. Visitors from Great Salt Lake and Laguna Mar Chiquita shared updates about the state of their lakes and what they are doing to protect them. Ryan and researcher Marcela Castellino from Mar Chiquita performed [“Me Llanan Falaropo”](#) (“They Call Me Phalarope”), a song he wrote in honor of phalaropes and their saline lake connections.



Mural of a Wilson's phalarope painted on a building facing Highway 395 in Lee Vining, one of three phalarope murals that Franco “Vato” Cervato painted in Lee Vining in 2023.

The morning before the festival began, Oikonos hosted an International Phalarope Working Group technical meeting focused on the next steps for international cooperation on phalarope research and conservation. The impressive international connections that came to fruition in the Phalarope Festival and phalarope murals were made possible with the help of many partners. In particular, Lee Vining residents Janet and Dave Carle provided critical leadership organizing the festival and facilitating Vato’s visit, and the Mono Lake Committee helped lead efforts to bring Vato and the visitors from Mar Chiquita to Lee Vining and hosted them, helped fund the murals, and integrated the Argentinian visitors and the Phalarope Festival into the Mono Basin Bird Chautauqua. The Mono Lake Tufa State Reserve and the Mono Lake Volunteer Program helped to put on the Phalarope Festival. The U.S. Forest Service International Program and Inyo National Forest helped fund, organize, and host the visit of the Argentinian delegation for the big weekend.



International Phalarope Working Group meeting at the Lakeview Lodge in Lee Vining. Organizations in attendance included Oikonos, Manomet (WHSRN), Fundación Líderes de Ansenuza, Aves Argentinas, San Francisco Bay Bird Observatory, USFS International Program, Parque Nacional Ansenuza, Sageland Collaborative, Saline Lakes Audubon.

Media outreach & publicity

An important component of this project is sharing the story of saline lakes and phalaropes through media outreach. In July, phalaropes, Mono Lake, and our work was featured in an episode of the PBS/Atlas Obscura television series [“Untold Earth.”](#) In August, a journalist and a photographer from Audubon Magazine joined us to gather notes and footage for an upcoming feature story highlighting our phalarope research and the growing international connection between Mono Lake and Laguna Mar Chiquita. Our work was also featured in two stories on Utah Public Radio this year, about how phalaropes highlight the connection of Great Salt Lake to other lakes across the hemisphere.

Future:

In 2024, we plan to continue survey and tagging work in collaboration with regional and international partners. We are also working with the Center for Biological Diversity on a proposal to list Wilson’s phalaropes under the U.S. Endangered Species Act, in response to the habitat crisis at saline lakes. Phalaropes can serve as a charismatic “umbrella species” to protect saline lakes as a network. We will continue to share their story and use our research to connect to policy and management at any opportunity.

2023 Project Staff:

Program director: Ryan Carle

Project Ecologists: Kiki Tarr & Katie Smith

Public Presentations & Media (2023 only)

We strive to share our results with the public regularly. Below is a list of public presentations, newsletter articles, and other outreach we have contributed during 2023.

Presentations

- Upcoming virtual & in-person talk by Ryan to Sequoia Audubon, San Mateo; December 14th 2023
- September 8th, 2023: Mono Lake Committee Refreshing ‘Ologists Lecture Series: **Phalarope research at Mono Lake and other key sites** by Kiki Tarr
- June 18th, 2023: **Mono Basin Bird Chautauqua: Saline Lakes Panel** featuring Ryan Carle

News media

- [Shorebird population health tied to saline lakes across western hemisphere](#) by Aimee Van Tatenhove, Utah Public Radio, January 2023
- [Ambitious initiatives and shorebirds connect two saline lakes hemispheres apart](#) by Aimee Van Tatenhove, Utah Public Radio, March 2023
- [Cien especies de aves migratorias están en riesgo por el avance humano y el cambio climático](#) by Valeria Román, Infobae (Argentinian newspaper), May 2023
- [What are these Strange Towers Growing out of this Lake?](#) PBS/Atlas Oscura Untold Earth television series. Episode aired August 2023.
- [How Decades of Hard-Earned Protections and Restoration Reversed the Collapse of California’s Treasured Mono Lake](#) by Bob Berwyn, Inside Climate News, October 2022

Selected Newsletter Articles

- **Tracking phalaropes at Mono and beyond** by Elin Ljung, Mono Lake Committee fall newsletter, October 2023
- [Wilson’s Phalaropes and their Journey from Canada to Argentina](#) by Emily Hamel, Audubon Western Water News, September 2023
- [Mono Lake part of Western Hemisphere shorebird survey](#) by Ryan Garrett, Mono Lake Committee blog, September 2023
- [The first ever Mono Basin Phalarope Festival!](#) by Kiki Tarr, Oikonos blog, August 2023
- [Strengthening the Network for the Conservation of Saline Lakes](#) by Marcela Castellino, WHSRN newsletter, July 2023
- [Following the phalaropes: Celebrating Argentina’s Ansenuza National Park at Laguna Mar Chiquita](#) by Arya Degenhardt, Mono Lake Committee blog, April 2023
- [Linking Salt Lakes: A Commitment Ratified for Posterity](#) by Marcela Castellino, WHSRN newsletter, January 2023
- [The Future for Phalaropes](#) by Ryan Carle, WHSRN newsletter, December 2022

Partners 2019-2023

Mono Basin Partners	Western U.S. Regional Partners	International Partners
Mono Lake Tufa State Natural Reserve	Eastern Sierra Audubon (Owens Lake, CA)	Western Hemisphere Shorebird Reserve Network (Manomet)
Dr. Margaret Rubega, University of Connecticut	East Cascades Audubon (Lake Abert, OR)	U.S. Forest Service International Program
Mono Lake Committee	Utah Division of Wildlife Resources (Great Salt Lake, UT)	Aves Argentinas
U.S. Geological Survey Western Ecological Research Center	San Francisco Bay Bird Observatory (SF Bay, CA)	Fundación Líderes de Ansenuza
Mono Basin National Forest Scenic Area	Point Blue Conservation Science	Parque Nacional Ansenuza (Argentinian National Park at Laguna Mar Chiquita)
Friends of Mono Lake State Park	Audubon Saline Lakes	Corporación Nacional Forestal (CONAF; Chilean Nat'l Park Service)
	Los Angeles Department of Water and Power	Environment and Climate Change Canada
	Sageland Collaborative	Thompson Rivers University, British Colombia, Canada
		Red de Observadores de Chile

Funders 2022-2023

Dechambeau Creek Foundation	University of Connecticut
California Department of Parks and Recreation	Wader Quest
Tracy Aviary Conservation Fund	U.S. Forest Service International Program
California Department of Fish and Wildlife	Center for Biological Diversity
Jeff Maurer Mono Basin Bird Chautauqua Research Grant	And generous contributions from private donors

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Flock of Wilson's phalaropes at Lee Vining Tufa in June 2023. Photo by David Carle.