AMPHIBIAN MONITORING
COMMUNITY SCIENCE PROGRAM
2023 REPORT

AMPHIBIAN MONITORING COMMUNITY SCIENCE PROGRAM

The Amphibian Monitoring Community Science Program is offered through Woodland Park Zoo's Living Northwest Conservation Program. Launched in 2012, the program provides much-needed data on amphibian populations for Washington Department of Fish and Wildlife (WDFW) and other land managers. To protect Pacific Northwest amphibians—frogs, toads, salamanders, and newts—wildlife managers need to understand where their populations are and how they are doing, which is one reason why we have enlisted community volunteers to gather critical data on amphibian presence and breeding activity in Puget Sound's urban and suburban landscapes.

Participants are trained and equipped with hip waders, GPS units, aquascopes, and other monitoring tools as they learn how to find, document and identify egg masses of different amphibian species in a way that's safe for people, wildlife and habitats. Volunteers are organized into teams and visit their wetland site monthly—recording data and taking photos of any egg masses or other life stages of amphibians they encounter. Over a six- to seven-month period, volunteers monitor for and submit data on eight different species of frogs, toads, and salamanders in wetlands throughout western Washington, including parks and other wetland sites across King and Snohomish counties.

2023 NUMBERS AT A GLANCE	
# TEAMS	**18**
# SITES	**21(some of these include multiple ponds; 3 sites were new this year)**
# VOLUNTEERS	**97**
# VOLUNTEER HOURS	**1,600+**
# OBSERVATIONS (as of October 27, 2023)	**646**
# RESEARCH GRADE OBSERVATIONS (as of October 27, 2023)	**229 (35%)**

Photo by Elaine Chuang, project volunteer

VOLUNTEER TRAINING

Woodland Park Zoo staff and experienced Amphibian Monitoring volunteer team leaders conduct the training for the volunteers. After registering, volunteers completed a self-paced, interactive learning module in Discovery Den, an online learning platform where the zoo provides program training, protocols, and supporting resources for volunteers. Additionally, all volunteers attended a live, online training session to review the data collection protocol, learn about updates, and connect team members with their team leader for each site. This session was followed by an optional in-person, field demonstration session at Carkeek Park in Seattle.

DATA MANAGEMENT PROCESS

All amphibian observations for this project are entered into iNaturalist with photos, georeference (latitude and longitude) and additional fields (weather, site conditions, etc.) as directed by the protocol. In iNaturalist, an observation can be entered with or without an initial species identification by the observer. Observations can then be validated or identified by project curators (project volunteers with expertise in amphibian identification who are recruited to assist with species identifications) and by the general iNaturalist online community. iNaturalist observations become "Research Grade" when the iNaturalist community agrees on an identification. During the 2023 season, a graduate student with Woodland Park Zoo and Miami University's Advanced Inquiry Program (AIP) worked with volunteers to ensure the quality and accuracy of their data submissions.

After each monitoring season, the data collected by community scientists is synthesized into this summary report; site-specific data is also summarized and provided to each land manager. Data are also openly available to the public on the iNaturalist platform.

During the 2021 season, a graduate student with the Advanced Inquiry Program interned with the project to extract, clean, and merge the 2012-2021 project data. We now have a complete Site Master list of every site monitored since 2012, which years the site was monitored, and whether amphibians were or were not found each year. Based on the Site Visit reports that volunteer teams now submit, we are tracking "no species observed" reports and have a more efficient method for calculating volunteer hours. The project also resulted in a clean Excel document of the project data from 2012 to 2021, to which each year of new data is now added. The data can be summarized in various ways, some of which are presented below. If you are interested in accessing this full dataset, please email monitoring@zoo.org with your request and a summary of what you plan to do with the dataset.

More information on data validation in iNaturalist can be found in this article: Boone, M.E. & Basille, M. 2019. *Using iNaturalist to contribute your nature observations to science.* Retrieved from https://edis.ifas.ufl.edu/uw458.

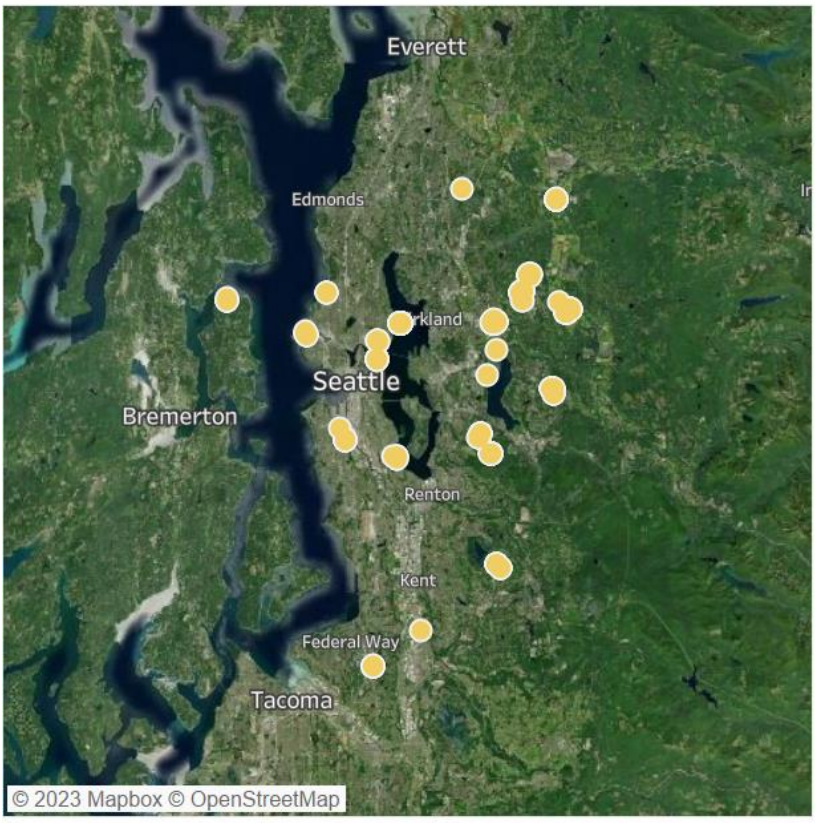
Amphibians of Washington project page:
https://www.inaturalist.org/projects/amphibians-of-washington/

SITES – 2023 SEASON

This year, the zoo again held an advisory meeting with local land management agencies and/or interested non-profit organizations to consider regional needs for annual site selection. Participants included municipal and state agencies, such as Bellevue Parks, Seattle Parks and Washington Department of Fish and Wildlife, as well as the Snoqualmie Tribe and Beavers Northwest.

The site selection advisory group discussed a site selection process that considers the following:

- The principal goals of the project: 1) to detect if common species are staying common and to look for presence of rare species, and 2) to contribute data to help detect long-term trends, including distribution of breeding sites across the urban landscape and shifting phenology of breeding periods.
- Volunteer accessibility and interest—strive to make science and conservation accessible to populations who may be underrepresented in science and conservation; allow volunteers to choose the location(s) they want to monitor.
- The geographic distribution of sites—include locations across a broad area throughout King and Snohomish counties.
- Sites of interest to the project's land manager collaborators
- Sites with known beaver activity (given new research about the positive influence of beaver activity on amphibian diversity)



Map of King and Snohomish counties showing sites monitored in 2023

In 2023, 18 teams monitored a total of 21 sites (some sites contain subsites—ponds separated from one another) with several being new this year, including a pond in the Rhododendron Garden and multiple waterbodies at Bloedel Reserve. Oxbow Farm & Conservation Center staff monitored two sites, each of which included a complex of subsites, using the zoo's protocol. Four of our 2023 sites were selected to assist with an effort to resurvey waterbodies surveyed in the early to mid-1990s by the King County Department of Natural Resources to assess if any notable changes in amphibian populations have occurred. These data are still being analyzed.

SITE	SUBSITES	LAND MANAGER
Big Bear Creek 24		Lake of the Woods HOA
Bloedel Reserve	Multiple Ponds	Bloedel Reserve
Camp Long		Seattle Parks & Recreation
Carkeek Park		Seattle Parks & Recreation
Crescent Lake (Snoqualmie Wildlife Area)		WDFW
Discovery Park	Wolf Tree Ponds	Seattle Parks & Recreation
Hazel Wolf Wetland		Forterra

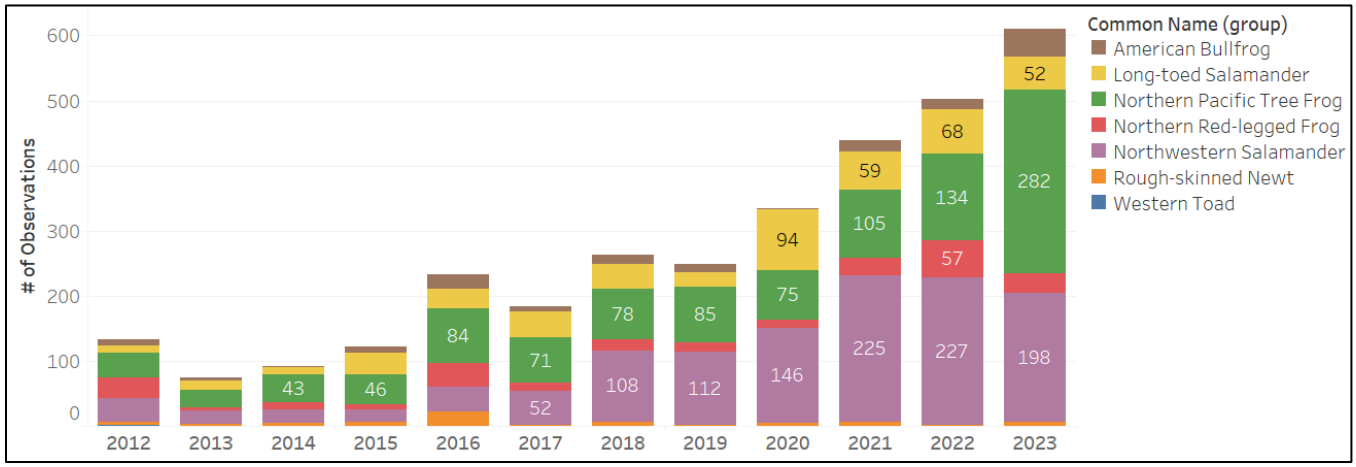
Keller Farm Mitigation Bank	Multiple ponds	Monitored by Oxbow Farm & Conservation Center
Lewis Creek	Two ponds (Main and North)	Bellevue Parks
Magnuson Park	Marsh Ponds	Seattle Parks & Recreation
Oxbow Farm & Conservation Center	Multiple ponds	Oxbow Farm & Conservation Center
Pritchard Island Park		Seattle Parks & Recreation
Puget Park		Seattle Parks & Recreation
Rainier Beach Urban Farm & Wetland		Seattle Parks & Recreation / Tilth Alliance
Redmond Watershed Preserve	Old Pond	City of Redmond
Rhododendron Park Pond		Rhododendron Garden
SHADOW Lake Nature Preserve	Two ponds (Lower and Upper)	SHADOW Lake Nature Preserve
Sky Country Trailhead (Cougar Mountain Regional Wildland Park)	Klondike South	King County Dept. of Natural Resources & Parks
Union Bay Natural Area	Multiple ponds	Seattle Parks & Recreation / UW Botanic Gardens
Washington Park Arboretum	Two ponds (Visioning and Woodland)	Seattle Parks & Recreation / UW Botanic Gardens

OBSERVATIONS – 2023 SEASON

SPECIES	**NUMBER of OBSERVATIONS PER SPECIES**
American Bullfrog	43
Amphibians (not identified to species)	35
Long-toed Salamander	52
Northern Pacific Tree Frog	282
Northern Red-legged Frog	29
Northwestern Salamander	198
Rough-skinned Newt	7
GRAND TOTAL	**646**

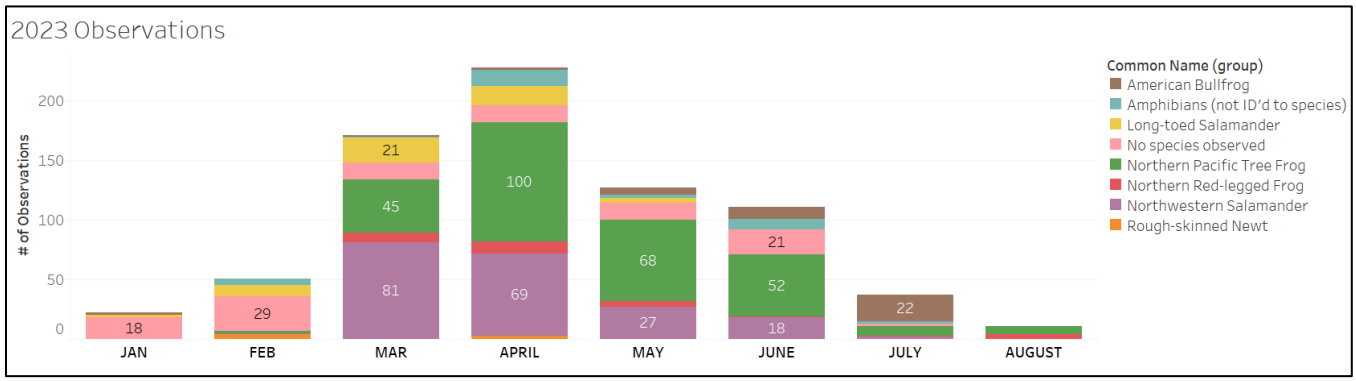
L to R: Northwestern salamander egg mass (M. Morgan), Pacific tree frog larvae (A. Weber);
Long-toed Salamander adult (H. Barnes); Pacific tree frog adult (H. Barnes)

2012-2023 – Observations per Year*



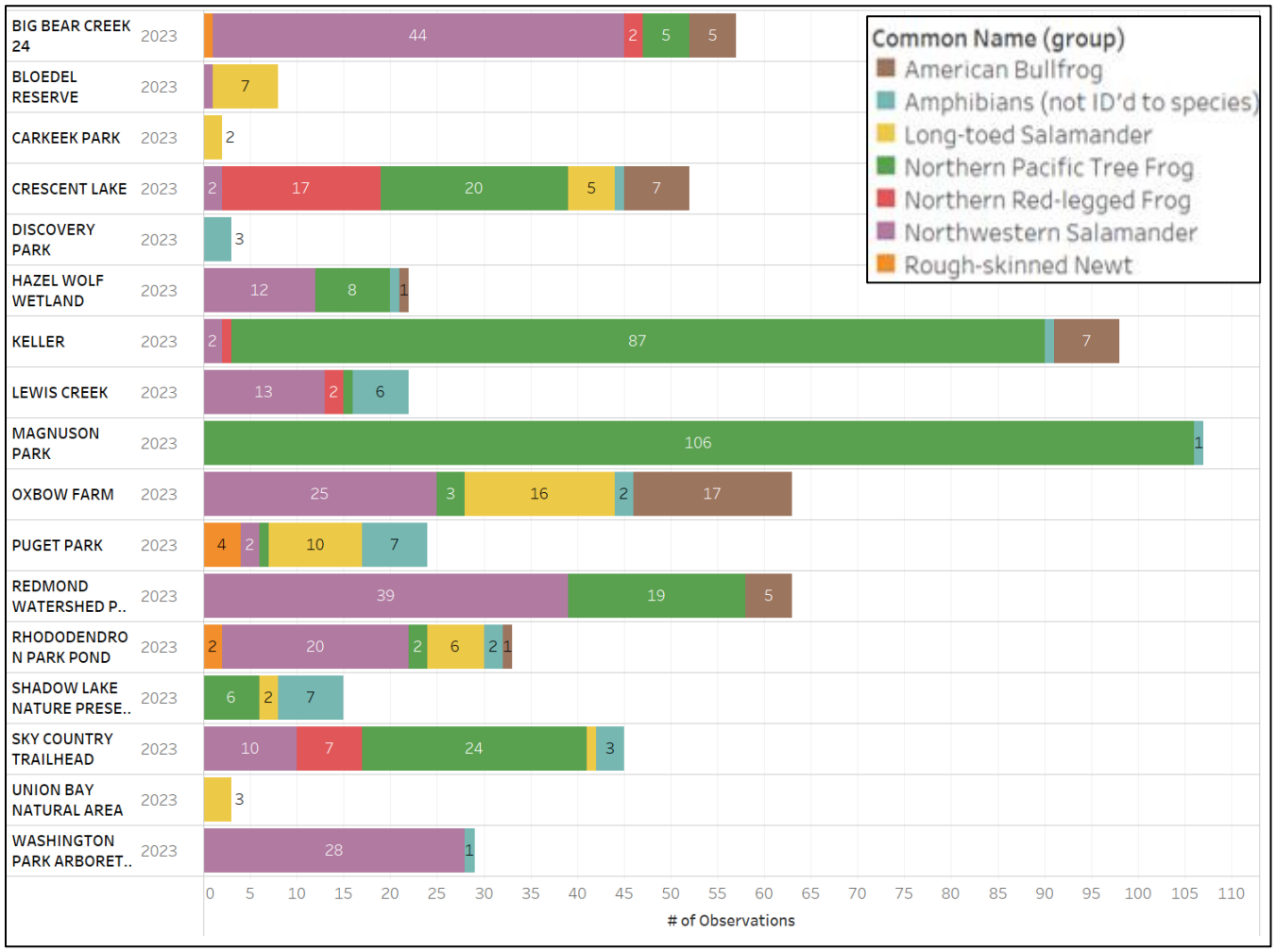
** only includes observations identified to species; number of observations represents the number of times each species was encountered in any life stage (not a count of egg masses or individuals)*

2023 – Observations of Species by Month*



** only includes observations identified to species; number of observations represents the number of times each species was encountered in any life stage (not a count of egg masses or individuals)*

2023 – Observations by Site*



** only includes observations identified to species; number of observations represents the number of times each species was encountered in any life stage (not a count of egg masses or individuals)*

The following sites were monitored during the 2023 season, but no amphibians were observed:

- Camp Long (amphibians observed, but no data received)
- Pritchard Beach Park
- Rainier Beach Urban Farm & Wetlands

NETWORKING AND HABITAT RESTORATION – 2023 SEASON

This past year, a grant from the National Fish and Wildlife Foundation's Five Star and Urban Waters Restoration Grant Program supported the enhancement and expansion of our program. In partnership with Oxbow Farm & Conservation Center, the zoo established the Pacific Northwest Amphibian Monitoring Network, affectionately called the "Newtwork," focused on increasing regional capacity. The zoo and Oxbow Farm hosted two virtual and one in-person network meetings (with 15 to 35 participants at each, from a variety of academic institutions, agencies, non-profits and native nations organizations). These meetings served to build relationships, share project information, discuss monitoring approaches and technologies

and explore how amphibian monitoring data can be leveraged to inform decision-making about habitat management, conservation action and restoration practices across our region. The zoo also partnered with Oxbow Farm and Green Seattle Partnerships/Seattle Parks to host five habitat restoration events (at Oxbow Farm in Carnation and at Magnuson Park in Seattle), at which zoo staff and Amphibian Monitoring volunteers helped remove invasive species and plant 417 native plants to benefit amphibians and their wetland and upland habitats.

ACKNOWLEDGMENTS

The lands that we monitor are the lands of the Tribal signatories of the Treaty of Point Elliott (1855), whose stewardship of the waters, plants, land and animal relatives in the Northwest has continued since time immemorial. Woodland Park Zoo acknowledges this stewardship, the sovereign rights of the Tribal signatories, and our responsibility to join with these Tribes to inspire and advance the restoration of relationships between humans and the living world around us.

In 2022-2023, this program was supported by a Five Star and Urban Waters Restoration grant funded by National Fish and Wildlife Foundation and FedEx*. Woodland Park Zoo would also like to thank the many organizations, agencies and people who make this program possible!

- All of our Amphibian Monitoring volunteer team leaders, volunteer team members, site selection advisors and iNaturalist project curators!
- Caroline Lee, Advanced Inquiry Program 2023 Project Intern
- Bellevue Parks & Community Services
- Bloedel Reserve
- Forterra
- King County Department of Parks and Natural Resources
- The James M. Lea Foundation
- Lake of the Woods HOA
- Oxbow Farm & Conservation Center
- Rhododendron Species Botanical Garden
- SHADOW Lake Nature Preserve
- Seattle Parks & Recreation
- Snoqualmie Tribe – Environmental & Natural Resources Department
- Tilth Alliance
- University of Washington Botanic Gardens
- Washington Department of Fish and Wildlife