

2023 Joint Annual Meeting  
**Recovery and Resilience in a Pandemic  
and Climate Changing World**

Great Wolf Lodge | Grand Mound, WA | April 24 – 29, 2023



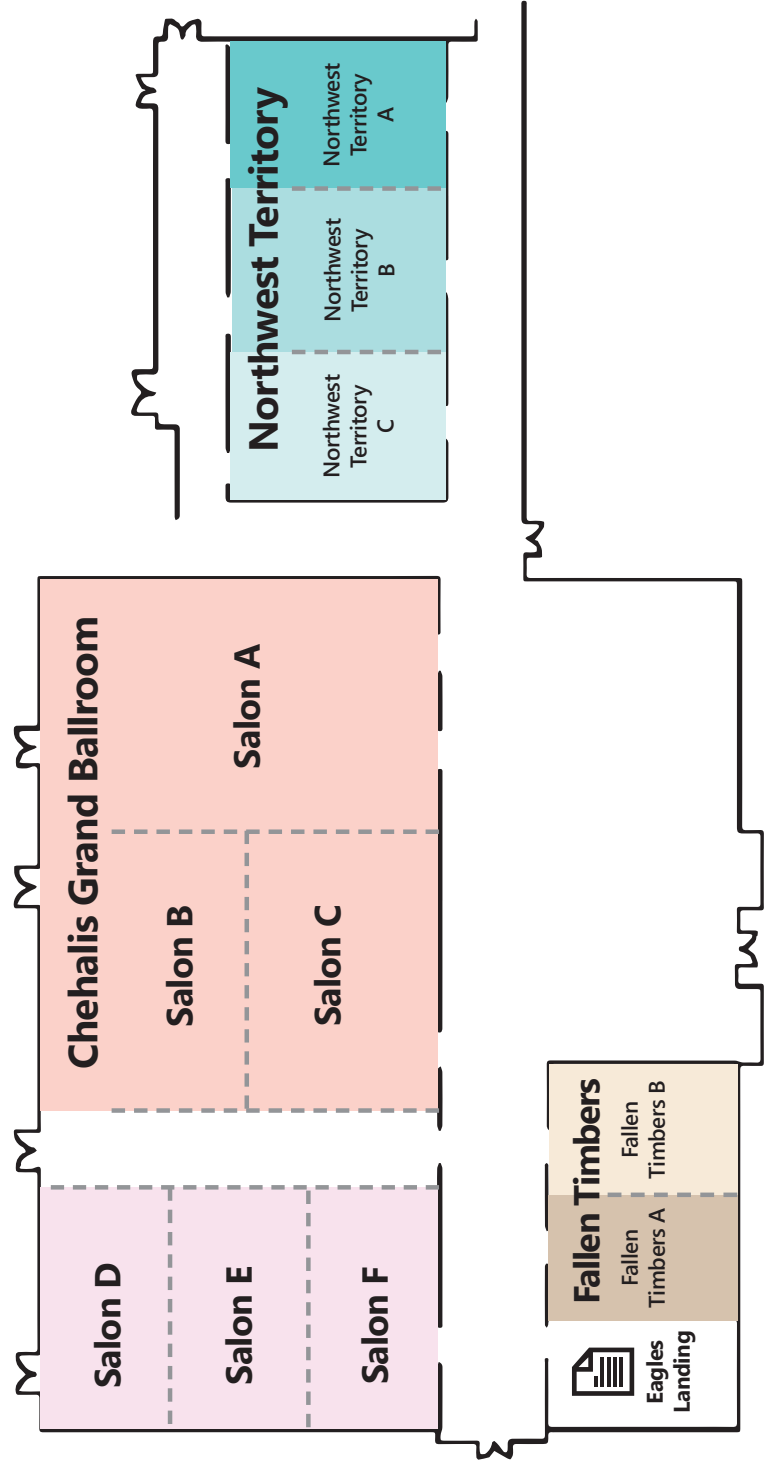
Artwork: Jocelyn Wagner

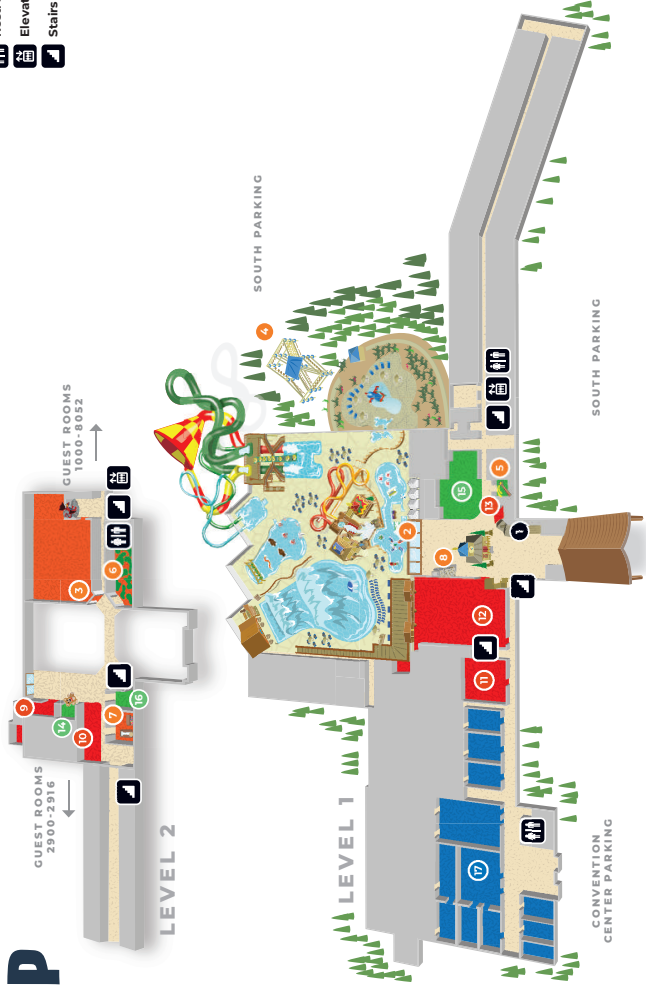


Hosted by the Washington Chapter of The Wildlife Society, The Society for Northwest  
Vertebrate Biology, and Northwest Partners in Amphibian and Reptile Conservation.

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### Great Wolf Lodge Meeting Room Layout





**GUEST SERVICES**

- 1 Front Desk and Guest Services

**ATTRACTIONS**

- 2 **Wiley's Waterpark**  
Pools, slides and water activities for every age
- 3 **Northern Lights Arcade**  
The newest games, plus prizes
- 4 **Howlers Peak Ropes Course**  
An elevated obstacle course on ropes
- 5 **MagiQuest, Compass Quest, Shadow Quest**  
An interactive adventure game

- 6 **Howl at the Moon Mini Golf**  
Nine challenging holes
- 7 **Olivers Mining**  
A sand-sifting hunt for gemstones
- 8 **Cub Club**  
Bingo, balloon twisting, crafts and more

**DINING**

- 9 **Hungry as a Wolf**  
Pizza, pasta and other Italian favorites
- 10 **Bear Paw Sweets & Eats**  
Cupcakes, ice cream and baked goods
- 11 **Lodge Wood Fire Grill**  
Locally-sourced food and beverage

- 12 **The Loose Moose Cottage**  
A buffet for every meal of the day
- 13 **Starbucks**  
Coffee, pastries and breakfast sandwiches

**SHOPPING**

- 14 **Build-A-Bear Workshop**  
Create your-own stuffed toys
- 15 **Buckhorn Exchange**  
Souvenirs, gifts and vacation essentials
- 16 **Great Wolf Candy Company**  
A wide assortment of candy and other sweets

**GROUPS & MEETINGS**

- 17 **Conference Center**

**Meeting Planning Committee**

*Steering Committee:* Alex Pavlinovic, Bill Vogel, Bruce Thompson

*Planning Committee:* Wendy Arjo, Candace Bennett, Kris Ernest, Marc Hayes, Jeff Kozma, Christine Parker-Graham, George Ritchotte, Laura Sprague, Jen Syrowitz, Teal Waterstrat

**Thank You**

This meeting would not be possible without the many volunteers who donated their time and energy. Thank you to everyone who made this meeting a success!

**Location, Information, and Attractions**

No matter what the weather outside is doing, the resort at Great Wolf Grand Mound keeps the 56,000 square foot indoor water park fun flowing 365 days per year. Located minutes south of Olympia, the all-suite property offers a spacious conference center, uncompromised culinary quality, and a unique set of attractions to cut loose at the end of the day.

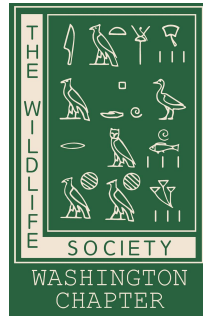


## Welcome from the Partners!

It is a pleasure to welcome you to the 2023 Joint Annual Meeting hosted by the Washington Chapter of The Wildlife Society, The Society for Northwestern Vertebrate Biology, and Northwest Partners in Amphibian and Reptile Conservation. Our societies have collaborated to bring you this special program dedicated to **Recovery and Resilience in a Pandemic and Climate Changing World**. We hope this week's events offer numerous opportunities for professional development and personal enjoyment and inspire a renewed appreciation for wildlife habitat stewardship.

### Washington Chapter of The Wildlife Society (WATWS)

The Washington Chapter of The Wildlife Society is a statewide affiliate of The Wildlife Society devoted to promoting excellence in wildlife stewardship through science and education. Chapter members represent a diverse array of wildlife conservation and management agencies, nongovernmental organizations, academic faculty, students, education programs, and other disciplines dedicated to conserving diversity, sustaining productivity, and ensuring responsible use of wildlife resources for the benefit of society. The Washington Chapter encourages research and professional growth through grants, workshops, annual meetings, and undergraduate scholarships. Learn more at <https://watws.org>.



### 2022-2023 Executive Board

*President:* Matt Wilson

*Immediate Past President:* Sara Hansen

*President-Elect:* Alex Pavlinovic

*Vice President:* George Ritchotte

*Secretary:* Candace Bennett

*Treasurer:* Bruce Thompson

*Board Members:* Merci Clinton, Kris Ernst, Jennifer Syrowitz, and Wendy Arjo



The partner organizations hosting this meeting will conduct a raffle and silent/live auctions as fund-raising events to benefit organizational activities. Raffle and auction items arise from a wide array of donations from members and sponsors. Proceeds, by mutual agreement, are shared by the partners to support various initiatives such as scholarships, conservation actions, research projects, and communication endeavors.

Anticipate opportunities to participate throughout the meeting, with Raffle and Silent Auction on Wednesday evening at the Welcome Reception, and silent/live auction during the Banquet on Thursday evening. Please be prepared to donate and participate in these opportunities to further support WATWS, SNVB, and NWPARC! Cash or checks are most helpful for payments; an ATM is available onsite.

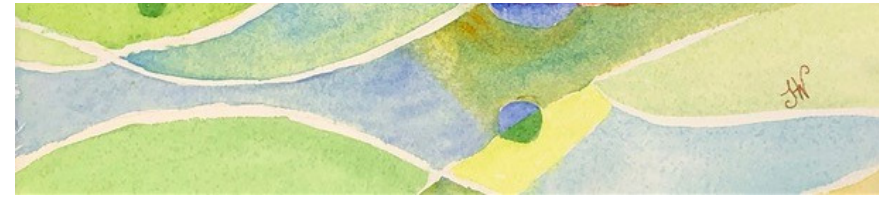
*No more than 3,000 raffle tickets will be sold at \$1.00 per ticket; there are no discounts for quantity ticket purchases. The tickets will be deposited in containers specific to each of multiple items included in the raffle. The probability for winning a specific item will be related to the total number of tickets deposited for such item and the number of tickets deposited by or on behalf of any specific ticket purchaser. Any related questions can be directed to the Treasurer of the WA-TWS at [treasurer@watws.org](mailto:treasurer@watws.org).*

## Contributed Posters

Posters will be displayed and presented in the Chehalis D/E/F Ballroom on Wednesday and Thursday.

\*Indicates a student presentation

Presenter	Poster Title
Bayard, Trina	Salish Sea Estuaries Avian Monitoring Framework
Bowens, Wesley T.	Coastal Tailed Frog Population Declines in Western Washington Managed Forests Eight Years After Timber Harvest
Bresee, Cecelia*	Parenting is No Yolk: Nesting Behaviors of Bushtits ( <i>Psaltriparus minimus</i> ) on the Seattle University Campus
Collins, Dylan	Staqeya: the Lone Wolf at the Edge of its Ecological Niche
Cook, Kimberly	In Situ Treatment of Juvenile Cascades Frogs for Chytridiomycosis can Reverse Population Declines
Foster, Alex D.	Cispus River Elk Forage Management and Monitoring
Garcia, Mercedes	Community Reporting and Camera Traps Identify Habitat and Human Demographic Factors That Affect Urban Wildlife Distributions
Hougan, Hannah	In-stream Breeding Conditions of the Western Toad ( <i>Bufo</i> = <i>Anaxyrus boreas</i> ) Across Washington's Chehalis Basin
Pearhill, Robert A	Microbe Surveillance in the Amphibian Pet Trade: Results from a Pilot Study
Pignatelli, Joseph J. III	Preliminary Findings of a Long Term Freshwater Turtle Population Study on Lake Washington, Seattle
Scott, Emma*	Development of a Management Plan for the Western Painted Turtle at the Sandy River Delta, Oregon
Thompson, Marianne	Movement of Coastal Tailed Frog Larvae Associated with Interstate 90
Trovillion, Daniel	Monitoring the Effectiveness of Beaver Dam Analogues as a Stream Restoration Tool in Western Washington
Tveten, Richard	Forest Management on Washington Department of Fish and Wildlife Lands



## Society for Northwestern Vertebrate Biology (SNVB)

Founded in 1920, SNVB is the oldest scientific association devoted to the study of vertebrates in the Pacific Northwest. Our society strives to promote professional working relationships among ornithologists, mammalogists, herpetologists, and ichthyologists in our region. Please explore our website ([www.thesnvb.org](http://www.thesnvb.org)) and check out our flagship publication, *Northwestern Naturalist*.

If you share our passion for learning about the natural history and ecology of the Northwest, our annual meeting is a great place to meet new people while learning about research currently being conducted in our region.



## Northwest Partners in Amphibian and Reptile Conservation (NWPARC)

Northwest Partners in Amphibian and Reptile Conservation is the Northwest Regional Chapter of Partners in Amphibian and Reptile Conservation.

We are a diverse group of like-minded citizens, professionals, and organizations dedicated to the conservation of herpetofauna (reptiles and amphibians) and their habitats. Our region includes individuals from Alaska, Washington, Oregon, Idaho, Montana, Wyoming, and parts of North Dakota, South Dakota, and California in the U.S., as well as British Columbia, Alberta, and the Yukon Territories of Canada. Membership is free of charge and available to anyone interested in conservation of herpetofauna in the Pacific Northwest.

Visit us at <http://www.nwparc.org/>.

*Current Co-chairs:* Laura A Sprague (USFWS) and Christine A. Parker-Graham, DVM, MA, Dipl. ACZM (USFWS)

*The Steering Committee has a representative from each of the states and provinces we cover.*



# Thank You to Our Sponsors and Financial Supporters!

## Platinum (\$2,400+)



## Gold (\$1,800 – \$2,399)



## Silver (\$1,200 – \$1,799)



## Friday, April 28

Time	NW Territory A	Chehalis E	Offsite
8:30 – 8:50am	<b>Turtles of the Pacific northwest: Biology and Management</b> Moderators: Gwen Bury, Don Ashton, and Bruce Bury Ecology, Status and Protection of the Western Pond Turtle in the Pacific Northwest: Overview of Efforts to Date and Remaining Questions; R. Bruce Bury	Wildlife Handling and Chemical Immobilization* (Day 1)	Field Trips ↓ Wolf Haven International ↓ Connectivity in Southwest Washington and across I-5
8:50 – 9:10am	Oregon Strategic Plan for Native Turtles; Susan Barnes		
9:10 – 9:30am	Age in a Population of Northwestern Pond Turtles (Actinemys marmorata): Long Lived Individuals and Averages; G. W. Bury		
9:30– 9:50am	Population Estimation Methods for Northwestern Pond Turtles, Washington; Staci Amburgey		
9:50 – 10:20am	<b>BREAK</b>		
10:20 – 10:40am	Testing the Efficacy of a New Turtle Basking Platform Incorporating a Planted Blind; Emilio Ricci		
10:40 – 11am	A Preliminary Analysis of the Influence of Outdoor Recreation on Freshwater Turtles in an Urban-Proximate Park; Joshua Kesling		
11 – 11:20am	Management and Monitoring of Oregon's Easternmost Northwestern Pond Turtle Population; Andrew Meyers		
11:20 – 11:40am	Updated Occupancy and Abundance for NW Pond Turtle and Western Painted Turtle in the Lower and Middle Willamette Watersheds; Laura Guderyahn		
11:40 – 12pm	Twenty-six Years and Counting: The Ecology of the Northwestern Pond Turtle on the Mad River, Humboldt County, CA; Matt Kluber		
12 – 1pm	<b>LUNCH ON YOUR OWN</b>	<b>LUNCH PROVIDED (for Immobilization class)</b>	
1 – 1:20pm	Introduced Red-eared Slider (Trachemys scripta elegans) in British Columbia, Canada: (1) Current Status and (2) Evidence of Successful Hatching; Aimee Mitchell and Brent Matsuda	Wildlife Handling and Chemical Immobilization (continued)	
1:20 – 1:40pm	Occurrence and Distribution of Invasive Snapping Turtles in Oregon; Madison Smith		
1:40 – 2pm	The Efficacy of Two Novel Treatments (Ponazuril and Humatin) for Cryptosporidium sp. in Western Painted Turtles (Chrysemys picta bellii); Andrea Gielens		
2 – 2:20pm	Emerging Health Concerns in Western Pond Turtles; Max R. Lambert		
2:20 – 5pm			

## Saturday, April 29

Time	OFFSITE
9 – 12pm	Wildlife Handling and Chemical Immobilization* (Day 2)
12 – 1pm	<b>LUNCH ON YOUR OWN</b>
1 – 5pm	Wildlife Handling and Chemical Immobilization* (continued)

Friday, April 28

# SNAKE ECOLOGY SYMPOSIUM

Day 2 of 2



Time	Fallen Timbers A/B
8 – 8:15am	Open Session: 2nd-Day Welcome, Housekeeping, Introduction of Session Moderator; Marc P. Hayes
8:15 – 9am	Breeding and Feeding: Harderian Gland Constituents Mediate Vomeronasal Functioning in GarterSnakes; Robert T. Mason
9 – 9:20am	Divergent Life-history Ecotypes in the Garter Snakes of Eagle Lake (Lassen National Forest, CA); Anne M. Bronikowski
9:20 – 9:30am	Climate Futures for Snakes in the Pacific Northwest; David S. Pilliod
9:30 – 9:40am	Effects of the Cheatgrass-fire Cycle on Snakes in Sagebrush Steppe; Kristina J. Parker
9:40 – 10am	The Effects of Trail-based Outdoor Recreation on Squamates in an Urban Proximate Park; L. Ashley D'Antonio/Gareth R. Hopkins
10 – 10:20am	<b>BREAK</b>
10:20 – 10:40am	Don't Take the Snakes! Reptile Management at a Public Preserve; Laura H. Trunk
10:40 – 11am	Road Crossing Ecology of Snakes in Central Washington Shrub-steppe: a Snapshot of Mortality, Occurrence, and Activity; Adrian C. Slade
11 – 11:20am	Cruising the Road to Conservation: The Citizen Science that Drives our Understanding of Snake Ecology; Jason L. Jones
11:20 – 11:40am	Snake Fungal Disease: Status and Strategy; Deanna H. Olson
11:40 – 12pm	Snake Fungal Disease on the Morley Nelson Snake River Birds of Prey National Conservation Area in Southwestern Idaho; Megan Yrazabal
12 – 1pm	<b>LUNCH ON YOUR OWN</b>
1:20 – 2:40pm	<b>Moderated Panel</b> Moderator: Chris Jenkins
2:40 – 3pm	<b>BREAK</b>
3 – 3:20pm	From Herps to Humans: How Outreach and Human Dimensions Can Shift Fear to Curiosity within Snake Conservation ; Lameace E. Hussain
3:20 – 3:40pm	Movement Ecology, Management, and Conservation of Great Basin Rattlesnake (Crotalus oreganus lutosus) on Military Training Lands in Northern Utah; Chris A. Frauenhofer
3:40 – 4pm	Determining Idaho Native Snake Elevation Ranges Using iNaturalist Data; Brenna R. Olson
4 – 4:20pm	Estimating Body Length from Tail Length Data in Gophersnakes (Pituophis catenifer); Marc P. Hayes
4:20 – 4:40pm	Dark, Cold and Hungry: Gene Expression during Prolonged Winter Dormancy in Garter Snakes; David L. Hubert
4:40 – 5pm	Highlights of the Snake Ecology Symposium/Acknowledgments and Awards; Marc P. Hayes and Charles R. Peterson

Bronze (\$500 – \$1,199)



Supporting (\$100 – \$499)



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# Conference Highlights

## Plenary Speakers



### James Johnston

James is an Assistant Professor (Senior Research) at Oregon State University College of Forestry. He holds a bachelor's degree in History from the University of Oregon and a master's and PhD in Forest Science from Oregon State University. His research interests include fire ecology, dendroecology, restoration forestry, environmental law and policy, and collaborative governance.



### Marguerite Pappaioanou

Dr. Pappaioanou is an epidemiologist and veterinarian with over 30 years of experience working toward improving global and U.S. public health. She served at the U.S. Centers for Disease Control and Prevention for 24 years, working in the areas of malaria prevention and control, HIV seroprevalence surveillance, directing a global capacity building Data for Decision Making

Project, and coordinating the CDC's response to SARS, Monkeypox, and Highly Pathogenic Avian Influenza global outbreaks, among others. As Professor of Infectious Disease Epidemiology in the University of Minnesota School of Public Health she led a large NIH- and CDC-funded research program focused on surveillance for avian influenza and other emerging zoonotic infectious diseases at the human-animal interface. She joined the University of Washington Center for One Health Research as Affiliate Professor in 2016, where she has focused on bringing multiple sectors and disciplines together to address challenges to the health and well-being of humans, animals, and earth's life support ecosystems. She also serves on the Puget Sound Environmental Monitoring Program Steering Committee and is a member of the Diseases Workgroup. She has authored and co-authored numerous publications, including as co-editor, the IOM/NRC Committee report "Sustaining Global Surveillance and Response for Emerging Zoonotic Diseases." She received her Doctor of Veterinary Medicine degree from Michigan State University in 1972, Master of Preventive Veterinary Medicine and Doctor of Philosophy degrees from the University of California, Davis, in 1976 and 1982, respectively. She retired as Captain in the US Public Health Service in 2005.

Thursday, April 27

# SNAKE ECOLOGY SYMPOSIUM

Day 1 of 2



Time	Fallen Timbers A/B
8:15 – 9am	Open Session: Welcome, Housekeeping Items, Introduction of Plenary Speaker; Marc P. Hayes
8:15 – 9am	Acquiring and Using Crowdsourced Data for Snake Ecology Studies and Conservation; Charles R. Peterson
9 – 9:20am	Synopsis of Striped Whipsnake ecology in Washington State; Lisa A. Hallock
9:20 – 9:30am	Conservation Genetics of the Striped Whipsnake (Coluber [Masticophis] taeniatus) in Washington, USA; David S. Pilliod
9:30 – 9:40am	Life History Patterns of a Small Fossorial Snake, the Common Sharp-tailed Snake (Contia tenuis) that Thrives in the Cold in Western Oregon; Dustin R. M. Campbell
9:40 – 10am	Rapid Post-Hatching Growth in the Common Sharp-tailed Snake (Contia tenuis); Richard F. Hoyer
10 – 10:20am	<b>BREAK</b>
10:20 – 10:40am	Tracking Movements of Sharp-tailed Snakes (Contia tenuis) with PIT-tag Telemetry on Vancouver Island, British Columbia; Kristina Ovaska
10:40 – 11am	Advancing Protections for a Relict Population of Sharp-tailed Snakes (Contia tenuis) through Collaboration, Community Engagement, and Indigenous Monitoring; Veronica R. Woodruff
11 – 11:20am	50 Years of Recaptures: Growth and Longevity in the Northern Rubber Boa (Charina bottae) from Long-term Recapture Datasets; Mark V. Leppin
11:20 – 11:40am	The Northwestern Ring-necked Snake (Diadophis punctatus occidentalis) in the Pacific Northwest: Life History, Behavior, and Habitat Use; Chris J. Rombough
11:40 – 12pm	The Northwestern Ring-necked Snake (Diadophis punctatus occidentalis) in the Pacific Northwest: Life History, Behavior, and Habitat Use; Chris J. Rombough
12 – 1pm	<b>SNAKE ECOLOGY SYMPOSIUM LUNCH</b>
1:20 – 1:40pm	Natural History of Venoms and their Role in the Evolutionary Success of Viperid Snakes; Steve P. Mackessy
1:40 – 2pm	Genomic Insight into the Biology of Rattlesnakes; Perry W. Blair
2 – 2:20pm	Predictive Modeling of a Cryptic Species, Crotalus oreganus concolor, to Inform Management Decisions in the Face of Energy Development in Wyoming and Colorado; Joshua Parker
2:20 – 2:40pm	Gestation-site Selection by Gravid Great Basin Rattlesnakes (Crotalus lutosus) in Southeastern Idaho; Vincent A. Cobb
2:40 – 3pm	<b>BREAK</b>
3 – 3:20pm	Ecological Variation of Washington Northern Pacific Rattlesnake (Crotalus oreganus oreganus) Populations in a World Shaped by Humans; Daniel D. Beck
3:20 – 3:40pm	Survival, Recruitment, Population growth ( $\lambda$ ) and Abundance in Great Basin Rattlesnakes (Crotalus lutosus); Bryan T. Hamilton
3:40 – 4pm	Modeling Western Rattlesnake Habitat Use and Connectivity; Stephen F. Spear
4 – 4:20pm	Does the Presence of Conspecifics Influence the Seasonal Migrations of Communally Denning Prairie Rattlesnakes (Crotalus viridis)?; Javan M. Bauder



## Thursday, April 27 (continued)

Time	NW Territory C
	<b>Marine Mammals; Moderator: Shawn Larson</b>
9:30 – 9:50am	Review of Remote Sedation Techniques for Field Immobilization and Disentanglement of Free-Ranging Pinnipeds; Dr. Michelle Rivard
9:50 – 10:20am	<b>BREAK</b>
10:20 – 10:40am	Pushing Ice Seal Surveys to the Edge: Automated Detection in the Arctic; Erin Moreland
10:40 – 11am	Using Close-kin Mark-recapture to Estimate Abundance and Survival of Bearded Seals in Alaska; Dr. Paul Conn
11 – 11:20am	AI for Gray Whales: Innovations in Support of Monitoring the Pacific Coast Feeding Group; Jason Holmberg
11:20 – 11:40am	Responses to Change: Ecophysiology and Demography of Antarctic Baleen Whales; Dr. Logan Pallin
11:40 – 12pm	Healthy Whales and Healthy Ecosystems; Dr. Ari Friedlaender
12 – 1pm	<b>LUNCH ON YOUR OWN</b>
	<b>Marine Mammals; Moderator: Shawn Larson</b>
1 – 1:20pm	Threats to Southern Resident Killer Whales in Expanded Critical Habitat Identified by Passive Acoustic Monitoring; Candice Emmons
1:20 – 1:40pm	Diel Patterns of Foraging Behavior in Southern Resident Killer Whales; Dr. Jennifer Tennessen
1:40 – 2pm	Effects of Vessels and Noise on Foraging Effort and Prey Capture by Southern Resident Killer Whales; Dr. Marla Holt
2 – 2:20pm	Do Boat Activities Affect the Behavior of Sounders in Inland Waters? A Study on Gray Whales ( <i>Eschrichtius robustus</i> ) in North Puget Sound; Alexander Pavlinovic
2:20 – 2:50pm	<b>BREAK</b>
2:50 – 3:10pm	Cataloging the Canaries of the Sea: Investigating the Vocal Repertoire of the Endangered Cook Inlet Beluga Whale Population; Ariel Brewer
3:10 – 3:30pm	Epigenetic Aging of Endangered Cook Inlet Beluga; Dr. Keith Hernandez
3:30 – 3:50pm	Whole-genome Sequencing of Blue Whales across Ocean Basins to Describe Population Structure; Dr. Angie Sremba
3:50 – 4:10pm	Identifying Individual Polar Bears From DNA In Footprints; Dr. Jennifer Adams
4:10 – 4:30pm	Space-use Strategies Drive Diet Composition of Baffin Bay Polar Bears; Jennifer Stern
4:30 – 4:50pm	Sea Otters: Population Status Worldwide, an Update on their Recovery and their Long History with People and how they Shaped Pacific Coastal Communities; Dr. Shawn Larson



### Richard Tveten

Richard Tveten has bachelor's and master's degrees in terrestrial ecology and fire ecology from Western Washington University. For the last ten years he has been the Forest Management Team Lead for the Washington State Department of Fish and Wildlife where his team manages over 200,000 acres of forest. So far his team has restored more than 18,000 acres of forest from stabilized

coastal dunes to subalpine woodlands and from Sitka spruce swamps to dry pine savannas. Richard has also worked as a wetlands consultant, the Washington State Department of Transportation statewide erosion control and stormwater team lead, and as a botanist on Joint Base Lewis-McChord. He currently lives in an oak woodland just a few miles from here.



### Jennifer Watkins

Jen Watkins is the Assistant Division Manager for Planning, Science, and Monitoring and Acting Division Manager for DNR's Forest Resilience Division. In this role she oversees the development of our strategic plans to improve forest health and resiliency across all-lands in Washington, science programs that help us understand the current and changing condition of our forests, tools

that help us to increase collaboration and track our progress toward our common goals, and staff capacity that plans and implements treatments and provides technical assistance statewide. Prior to joining DNR, Jen graduated from the University of Washington's College of Forest Resources and spent nearly 20 years in the non-profit sector working on landscape scale planning, climate adaptation, forest restoration, and collaboration in Washington.



### Matthew Danielson

Matthew leads Conservation Northwest's Forest Field Program work on the Okanogan National Forest, including coordinating with the Northwest Washington Forest Health Collaborative Methow and Entiat ranger districts, as well as the Tonasket Ranger District of the Colville National Forest. Matthew was born and raised in Omak, Washington and continues to live and work

there. He received a B.S. in Environmental Science from Western Washington University and spent his college summers working on wildlife survey, timber marking, and wildfire suppression crews for the U.S. Forest Service. After graduating, he ran around the Inland Northwest supporting different carnivore research projects before finding permanent work for Department of Natural Resources as a timber sale biologist in Washington's lynx habitat for several years.

## Special Events

### Workshops, Trainings, and Field Trips

#### Amphibian Conservation Working Sessions (All day Monday)

Changing climatic conditions threaten many at-risk amphibians in the Pacific Northwest and also may enhance the risk of disease and invasive species encroachment. State and federal wildlife agencies are in the process of evaluating these threats, but information is lacking on: 1) availability of suitable habitat under different climate scenarios; 2) vulnerability of at-risk amphibians to different diseases, and how climate change will affect that vulnerability; and 3) potential future spread of harmful invasive species like American bullfrogs. This working session is part of a project aimed at providing actionable science that fills these knowledge gaps, and will focus on how changing climatic conditions affect habitat suitability for at-risk amphibians and American bullfrogs. The session will include a presentation describing work in progress, discussions to identify suitable methods and deliverables, and goal setting for future work.

#### An Overview of Genomic Approaches for Wildlife Conservation and Management (Monday PM)

This workshop is designed to provide an overview of genomic methods that can be used to address research questions in wildlife ecology, conservation, and management. The field of wildlife genetics is being transformed by new genomic methods. This workshop will cover the topics of whole genome sequencing, reduced representation sequencing, identifying adaptive loci, single nucleotide polymorphism genotyping panels, eDNA metabarcoding, and diet metabarcoding. The workshop will include examples of how these new methods are being used to identify conservation and management units, assess genetic diversity and gene flow, monitor biodiversity, detect invasive species, and understand adaptation.

#### DEI Foundations and Bystander Awareness (Tuesday AM)

This training will cover several topics with an emphasis on providing interactive opportunities for attendees to practice concepts and become more comfortable with material in small-group settings. Topics include: foundational vocabulary on diversity, equity, and inclusion; the difference between sexuality and gender; how to respectfully use pronouns, share your own, and ask for someone else's; anti-discrimination laws and legal requirements for protected statuses; how to report issues and when/how to call folks in versus call them out; and empowering individuals to become

## Thursday, April 27 (continued)

Time	NW Territory B
8:30 – 8:50am	<b>Ecological Responses to Forest Management;</b> Moderators: Aimee McIntyre and A.J. Kroll Rangewide Characterization of Habitat Suitability for Headwater Stream-Associated Torrent Salamanders; Lindsey Thurman
8:50 – 9:10am	Analysis of Genetic Structure within the Cascade Torrent Salamander Suggests Distinct Lineages and Ancient Dispersal Events Form Present-Day Populations; Chris Cousins
9:10 – 9:30am	Response of Stream-associated Amphibians to Timber Harvest with Alternative Riparian Buffer Configurations; Reed Ojala-Barbour
9:30 – 9:50am	Stream-Riparian Forest Management: Beyond BMPs; Dede Olson
9:50 – 10:20am	<b>BREAK</b>
10:20 – 10:40am	Cumulative Effects of Forest Management on Riparian System Aquatic Macroinvertebrates; Bob Danehy
10:40 – 11am	Water Quality and Aquatic Ecosystem Responses Across Gradients of Forest Stand Age; Ashley Coble
11 – 11:20am	Freshwater Biodiversity across Forest Stand Age; Brooke Penaluna
11:20 – 11:40am	Assessing Spatial and Temporal Variation in the Upper Extent of Coastal Cutthroat Trout ( <i>Oncorhynchus clarkii</i> ) Distribution Within Headwater Streams in Southwest Washington, USA; Jason Walter
11:40 – 12pm	Ripple Effects: Changing Forests and Freshwater Mussel Communities; Andrew Lawrence
12 – 1pm	<b>LUNCH ON YOUR OWN</b>
1 – 1:20pm	<b>Forest Mgmt. to Increase Structural Complexity and Wildlife Use;</b> Moderators: Claudine Reynolds and Jake Verschuyf Wildlife Habitat on Small Forest Ownerships: A Habitat Diversity Emphasis; Ken Bevis
1:20 – 1:40pm	Characteristics of Snags Used by Woodpeckers in the Eastern Cascades: Implications for Forest Management; Jeff Kozma
1:40 – 2pm	Long-term Growth Rate and Survival of Green Recruitment Trees in a Managed Forest in Southwest Washington; Leif Hansen
2 – 2:20pm	Biodiversity Responses to Experimental Forest Retention Treatments; Jake Verschuyf
2:20 – 2:50pm	<b>BREAK</b>
2:50 – 3:10pm	Expanding the Forest Management Toolbox: Large-Scale Field Experiment on Washington State Lands; Stacey Dixon
3:10 – 3:30pm	Evaluation of Upland Hardwood Patches using Three Taxa in Douglas-fir Production Forests; Claudine Reynolds
3:30 – 3:50pm	Black Bear Denning Ecology Relative to Intensively Managed Forests; Vanessa Petro
3:50 – 4:10pm	Potential Conservation Value of Slash Piles for Pacific Fishers in Working Forests; Jordan Ellison
4:10 – 4:30pm	Retention and Recruitment of Coarse Woody Debris as Measurable Forest Management Targets; A. J. Kroll
4:30 – 4:50pm	How Science is Applied to Wildlife Management Plans for Private Landowners; Fran Cafferata

# Thursday, April 27

Time	Chehalis D/E/F	Chehalis A/B/C	NW Territory A
7am – 8:15am		Breakfast	
8:30 – 8:50am	 <p><b>Join a Wildlifer for Breakfast!</b></p> <p><i>No cost if indicated during Registration.</i></p>		<b>Shrub-steppe Habitat and Species Conservation</b> Moderator: Scott Downes, WDFW Overview of Shrubsteppe Habitat Threats, Conservation and Challenges to Restoration; Mark Teske Conservation Conundrum: How the Conservation Reserve Program Became Critical Habitat for the Columbia Basin Pygmy Rabbit; Jon Gallie Dynamic Models to Guide Columbia Basin Shrubsteppe Conservation in an Era of Rapid Environmental Change; Andrew Shirk Geospatial Data and Tools to Support Thoughtful Decision Making in the Shrubsteppe; Vincent Jansen
8:50 – 9:10am			
9:10 – 9:30am			
9:30 – 9:50am			
9:50 – 10:20am			<b>BREAK</b>
10:20 – 10:40am			Supporting Biodiversity Protection Under Washington's Clean Energy Transition; Trina Bayard
10:40 – 11am			Grazing, Fuels, and Fire...is There a Relationship? Is There a Goal?; Jeff Burnham
11 – 11:20am			The Washington Shrubsteppe Restoration and Resiliency Initiative: A New Model for Shared Resource and Service Delivery for Shrubsteppe Conservation; Janet Gorrell
11:20 – 11:40am		Poster & vendor display	Threats Contributing to the Ferruginous Hawk's Declining Status in Washington; James Watson
11:40 – 12pm			Conserving the Shrub Steppe Through Public-Private Partnerships; Ryan Lefler
12 – 1pm	<b>LUNCH ON YOUR OWN</b>		
1 – 1:20pm	<b>Small Mammals and Birds; Moderator: Ian Shriner</b>		
1:20 – 1:40pm		Prediction of Canada Lynx Habitat. Upscaling TLS Ground Cover Classifications to Landscape Level ALS; Jonathan Batchelor	
1:40 – 2pm		Prediction of Canada Lynx Habitat. Upscaling TLS Ground Cover Classifications to Landscape Level ALS; Ian Shriner	
2 – 2:20pm		Prediction of Canada Lynx Habitat. Upscaling TLS Ground Cover Classifications to Landscape Level ALS; Ben Turnock	
2:20 – 2:50pm		Pikas Rock! Colonization and Use of Anthropogenic Rock Structures along Roads by the American Pika (Ochotona princeps), a Rocky Habitat Specialist; Kristina Ernest	
2:50 – 3:10pm		<b>BREAK</b>	
3:10 – 3:30pm	Poster & vendor take down	Genetic Monitoring of the Columbia Basin Pygmy Rabbit ( <i>Brachylagus idahoensis</i> ): A 12-year study (2011-2023); Stacey Nerkowski	
3:30 – 3:50pm		Annual Survival of Adult White-headed Woodpeckers in Ponderosa Pine Forest with a History of Forest Management; Jeff Kozma	
3:50 – 4:10pm		Monitoring for Marbled Murrelet and Northern Spotted Owl at Naval Radio Station Jim Creek with implications for future Marbled Murrelet Surveys; Adam Duarte/Alicia Higgs	
5 – 6pm	Take-down		Additional Q/A, discussion or adjourn
6 – 9pm		Mixer	 <p>Join us for banquet; food, drinks, awards, auction and raffle!</p>

active bystanders when they witness any discriminatory behaviors. We aim to provide an overview of these topics while also highlighting ways attendees can implement these lessons in their own lives, agencies, and professional societies. We also will highlight the work of existing groups (e.g., Partners in Amphibian and Reptile Conservation's DEI Task Team, The Wildlife Society's Out in The Field) as ways attendees can continue learning on these topics after this training is completed.

 **Field Trip: Herps in the Black River Watershed (Tuesday AM)**

**Conservation Communication (All day Tuesday)**

The objective of this course is to introduce and explore key facets of effective communication processes in natural resources conservation settings among diverse resource professional backgrounds in a day-long interactive workshop to help participants think and judge as professionals. Exercises and discussion among participants and leaders will emphasize: elements of effective communication, attitudes toward wildlife as influences on conservation communication; decision styles and group decision-making in resource conservation; strategic thinking and forming effective objectives; diffusion of innovations; working with other disciplines and citizenry; and working with media professionals and advocacy in the professional setting.

**Indigenous and Western Science Communities Working Together (All day Tuesday)**

This workshop is designed as an open forum to foster new partnerships between western scientists and indigenous peoples. We will discuss and learn ways that we may better communicate, coordinate, and understand relations between indigenous peoples and western scientists. We believe that we can gain knowledge and new ways of thinking about conservation science by organizing our efforts collectively. This is an opportunity to better understand our common interests in conservation and shared concerns for nature. Exercises and discussion among workshop participants and the leader will emphasize communications (including ethical space), Indigenous and Western science knowledge systems, relational values, monitoring, training, and conservation through reconciliation.

 **Field Trip: Connectivity in Southwest Washington and across I-5 (Friday AM)**

Join Conservation Northwest staff on a field trip to a camera-monitoring site and training facility at a farm adjacent to Interstate-5 (I-5) that sits on the edge of one of the recently modeled wildlife corridors that cross I-5. The site is less than 8 minutes from the Great Wolf lodge, and it will be reflective of

topics covered in the special session on connectivity, climate, and conservation. We will learn about the monitoring of wildlife with trail cameras, I-5, corridors, and the farm, while walking through 120 acres of heavily altered retired commercial agriculture farmland in the early stages of restoration. We will learn about the work the caretakers of the farm (Veterans Ecological Trades Collective) do and how they are restoring the land, while partnering with Conservation NW in seeking wildlife crossing structures on I-5.

 **Field Trip: Wolf Haven International (Friday AM)**

Wolf Haven International is a nationally recognized wolf sanctuary that has rescued and provided a lifetime home for over 300 displaced, captive-born animals since 1982 under the mission “to conserve and protect wolves and their habitat.” Wolf Haven supports the restoration of wolves in their historical ranges, participates in the Saving Animals From Extinction (SAFE) programs for the critically endangered red wolf and Mexican wolf, and partners in the study and restoration of prairie habitat and native species. Join us on a guided walking visit through our wolf sanctuary and the Patrick Vance Dunn Memorial Prairie.

**Wildlife Handling and Chemical Immobilization (All day Friday and Saturday)**

Strengthen your confidence with the Global Wildlife Resources (GWR) wildlife handling and chemical immobilization workshop. Learn the latest drug combinations and fine-tune your field protocols. This 2-day course provides 12 CE hours for the TWS Professional Development Program and is a slightly condensed version of the 3-day courses that GWR teaches across the U.S. and Canada. This workshop will include lecture, discussion, videos, and a hands-on lab each day. A drug delivery lab provides opportunity for participants to practice a variety of projectors. A needle and syringe lab teaches basic skills and improves old skills for working with needles and syringes, syringe poles, and blood collection. The needle and syringe lab builds good habits to maximize human safety, animal care, and successful chemical immobilization. This course emphasizes care and respect for every animal and colleague.

**Wednesday, April 26 (continued)**

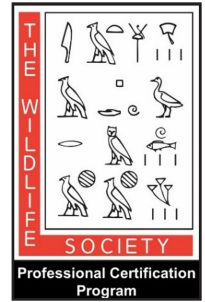
Time	NW Territory A	NW Territory B	NW Territory C
12 – 1pm	<b>LUNCH PROVIDED (in Chehalis A/B/C)</b>	<b>NWPARC BUSINESS LUNCH</b>	<b>SNVB BUSINESS LUNCH</b>
1:10 – 1:30pm	<b>Large Carnivores and Ungulates</b> Moderator: Hayley R. Rowe	<b>Amphibians and Conservation</b> Moderator: Tony Fuchs	<b>Beaver-Related Restoration</b> Moderator: Jesse Burgher
	Evaluating Genetic, Telemetry and Camera-Based Methods for Counting Cougars; Cameron Macias	Prioritizing Populations in Conservation Directly: A How-to-guide with Examples from Amphibians, Marmots, and Caribou in Canada; Mark Thompson	The Merits, Missteps, and Persistent Mysteries of Beaver-related Restoration; Dr. Caroline Nash
1:30 – 1:50pm	Genetic Diversity and Effective Population Size of the Selkirk Grizzly Bear Population; Megan Turnock	Oak Woodland and Prairie Restoration on the Scatter Creek Wildlife Area in Western Washington; Richard Tveten	Helping Beavers Help Us Restore Riverscapes: Insight from Beaver-based Restoration Projects in Washington and Colorado Watersheds; Alexa Whipple
1:50 – 2:10pm	A Peek Under the Hood: Using Accelerometers to Infer Behavior and Energetics in Grizzly Bears; Anthony Carnahan	Mitigating the Risks of Climate Change on Timberlands: Perspectives of a Large Private Landowner; Jessica Homyak	A Modern History of Beavers in the Puget Sound Lowlands, and the Planning for Beavers Manual; Jen Vanderhoof
2:10 – 2:30pm	Bears and Boots: Bettering the Relationship between Wildlife and Recreation; Kurt Hellman	Field safety and psychological first aid; Tara Chestnut	Beaver Coexistence for More Resilient Urban Wetlands; Rachel Dirks
2:30 – 3pm	<b>BREAK</b>	<b>BREAK</b>	<b>BREAK</b>
3 – 3:20pm	Determining Spatiotemporal Responses of Elk to Recreation in the Western Cascades; Michael Procko	There’s Something in the Water: Steps to Understanding the Cues for Oregon Spotted frog ( <i>Rana pretiosa</i> ) Breeding; Andrea Gielens	Beaver Translocation: Past, Present, and Future in Washington and Beyond; Molly Alves
3:20 – 3:40pm	Removing Non-native Mountain Goats from the Olympic Peninsula; Patti Happe	Breeding Response of Amphibians to Stochastic Aquatic Habitat Availability – Observations from JHTMON-9 Upper and Lower Campbell Reservoir Amphibian Assessment; Leah Ballin	Amphibian Facilitation by Beavers: A Review and Next Steps to Address Knowledge Gaps; vJuliana Hoza
3:40 – 4pm	Survival Patterns of Washington Mountain Goats, 2002-2022; Richard Harris	New Environmental DNA (eDNA) Protocols and Monitoring for Two Secretive Terrestrial Salamanders; Sky Button	Using Environmental DNA to Improve Beaver-related Restoration; Jesse Burgher
4 – 4:20pm	Wheat or Wild? Mule Deer Habitat Selection and Migration in an Agricultural Landscape in Southeastern Washington; Lisa Shipley	Washington Northern Leopard Frog Recovery Program: Post-release Monitoring of Behavior and Predator Threats; Erica Crespi	Evolving Relationships between Beaver and Salmonids in the Context of Climate Change; Dr. Michael Pollock
4:20 – 5pm	Additional Q/A, discussion or adjourn	Conservation Challenges and Successes for Amphibians during Road Construction on the West Coast of Vancouver Island; Krysia Tuttle	Additional Q/A, discussion or adjourn
		Additional Q/A, discussion or adjourn	

## Wednesday, April 26

Time	Chehalis D/E/F	Chehalis A/B/C	Fallen Timbers A/B
8am – 9am	Poster & vendor display set-up		
9 – 12pm	<div style="border: 1px solid black; padding: 5px;"> <p><b>Plenary</b> Welcome</p> <p><b>Plenary Session</b> Emerging Zoonotic Infectious Diseases and Pandemics in the Anthropocene Era: Societal Choices Impacting the Health of Life Sustaining Ecosystems, Wildlife, and People</p> <p><b>Plenary Panel</b> Recovery and Resilience in Dry Forests</p> </div>	Plenary session	
12 – 1pm		LUNCH (Free for all registrants)	<b>WATWS BUSINESS LUNCH</b>
1:10 – 1:30pm			<b>Climate and Connectivity in SW Washington</b> Moderator: Jeff Azerrad, WDFW
1:30 – 1:50pm			Wildlife Habitat Connectivity Concepts; Mark Teske
1:50 – 2:10pm			Enhancing Climate Connectivity as a Strategy for Wildlife Resilience to Climate Change; <b>Harriet Morgan</b>
2:10 – 2:30pm			Washington Wildlife Habitat Connectivity Working Group: Cascades to Coast Connectivity Analysis; <b>Brian Stewart</b>
2:30 – 3pm			Highways and Habitat Connectivity: How are Habitat Connectivity Priorities Determined by the Washington State Department of Transportation and Where Are They?; <b>Glen Kalisz</b>
3 – 3:20pm			<b>BREAK</b>
3:20 – 3:40pm			Connecting the Landscape, How to Identify and Build a Strategy for Landscape Scale Wildlife Connectivity; <b>Scott Downes</b>
3:40 – 4pm			Habitat Protection in an Urban Setting: Strategies to Inform Planning and Action in the City of Bellingham; <b>Analiese Burns</b>
4 – 4:20pm		Habitat Connectivity in Action: Updates, Success Stories, and Lessons Learned from the Interstate 90 Snoqualmie Pass East Wildlife Crossing Project; <b>Glen Kalisz</b>	
4:20 – 5pm		Olympic Cougar Project; <b>Mark Elbroch and Kim Sager-Fradkin</b>	
6:30 – 8:30pm	Poster presentations	 <p><b>Hosted Welcome Reception</b> Join us for food, beverages, mingling, animal calling contest, silent action and raffle!</p>	
8:30 – 9pm			

## Continuing Education

The Wildlife Society has approved the 2023 Joint Annual Meeting for professional development credit. Attendees can earn up to 35.5 CEUs in Category I of the Certified Wildlife Biologist®/Professional Development Certificate Program. One CEU can be earned for every hour of classroom-style learning, and one CEU can be earned for every 3 hours of a field session. To document CEUs, applicants need to log completed hours on their Renewal Application or Professional Development Certificate application.



### Icebreaker: Wildlife for All – Celebrating Diversity (Tuesday)

Please join us for this social event to help celebrate who we are as a wildlife community. This year's event values our members of the LGBTQIA+ community. This is a great opportunity to meet other wildlifers, participate in get-to-know-you activities (Wildlife Bingo), and enjoy snacks and refreshments. All are welcome.

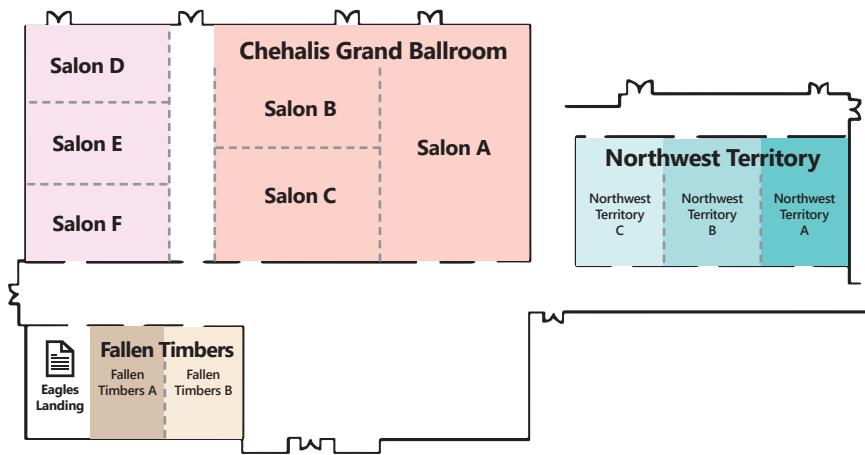
### Welcome Reception (Wednesday)

The Welcome Reception is the primary opportunity for our diverse set of participants to come together in an entertaining social and professional setting. There will be food (included with registration fee), beverages (gratis and no-host), and lots of time for mingling. There also will be opportunities for professional engagement during the Poster Session held in conjunction with the Reception. Silent Auction and Raffle items will contribute further to the enjoyment. Please arrange your schedule to ensure that you can participate in this time to reacquaint, make new friends, learn, and enjoy. We encourage members of the various organizations to mingle and contribute to improving both personal and professional relationships among TWS, SNVB, and PARC

### Social Mixer and Awards Banquet (Thursday)

The Social Mixer and Awards Banquet on Thursday evening is an opportunity for participants to mingle, dine, and enjoy camaraderie. We also will be recognizing an array of accomplishments through awards to be presented by the partners hosting the Joint Meeting. There will be light entertainment as well as additional opportunity to support the organizations through participation in the culminating Silent Auction and Raffle events. Banquet tickets should be purchased in advance of the Joint Meeting through the online registration website. There may be some limited opportunities to obtain a Banquet ticket during on-site registration.

### Great Wolf Lodge Meeting Room Layout



## Extended Daily Schedule

### Monday, April 24

Time	Fallen Timbers A	Fallen Timbers B
10am – 12pm	<b>Northwest Herpetology</b> Moderator: Jonah Piova-Scott Effects of Climate, Invasive Species, and Disease on PNW Amphibians; Moderators: Jonah Piova-Scott and Sky Button	
12pm – 1pm	<b>LUNCH ON YOUR OWN</b>	
1pm – 5pm	<b>Northwest Herpetology</b> Moderator: Jonah Piova-Scott Monitoring/Surveillance Needs for PNW Amphibian Populations; Moderators: Katie Remine and Matt Distler	<b>An Overview of Genomic Approaches for Wildlife Conservation</b> Moderator: Stacey Nerkowski
6pm – 7pm	Joint Planning Committee meeting	

### Resume Review Sessions (Tuesday, Wednesday, and Friday)

Resume reviews will take place in **Eagles Landing** on the following days:

- Tuesday, April 25th from 5pm – 6pm
- Wednesday, April 26th from 5pm – 6pm
- Friday, April 28th from 8am – 1pm

### Tuesday, April 25

Time	NW Territory B	Fallen Timbers A	NW Territory A	Chehalis D/E/F	Offsite
8am – 9am					
9:30am	DEI Foundations and Bystander Awareness Training	Conservation Communication	Indigenous and Western Science Communities Working Together		9:30am Field Trip
9 – 12pm					
12 – 1pm	<b>LUNCH ON YOUR OWN</b>				
1 – 1:20pm	<b>Special Session: Wildlife Morbidity and Mortality</b> Moderator: Christine Parker-Graham Association of Antler Asymmetry with Hoof Disease in Elk; Margaret Wild	Conservation Communication	Indigenous and Western Science Communities Working Together		Herps in the Black River Watershed
1:20 – 1:40pm	Associations between Hair Trace Mineral Concentrations and the Occurrence of Treponeme-associated Hoof Disease in Elk; Steven Winter				
1:40 – 2pm	Transmission and Lesion Progression of Treponeme-Associated Hoof Disease in Captive Elk ( <i>Cervus canadensis</i> ); Zachary Robinson				
2 – 2:20pm	Do Aquatic Mammals Inadvertently Spread Amphibian Chytrid Fungus on their Fur?; Tara Chestnut				
2:20 – 2:50pm	<b>BREAK</b>				
2:50 – 3:10pm	Intradermal Clefing in a Cachexic Ball Python ( <i>Python regius</i> ); Susie Masecar				
3:10 – 3:30pm	Susceptibility of U.S. Pacific Northwest Native Amphibians to Fish Rhabdoviruses; Evi Emmenegger				
3:30 – 3:50pm	Bat Monitoring and White-nose Syndrome Surveillance in Washington's National Parks; Tara Chestnut				
3:50 – 4:10pm	Dead Birds for Conservation Science and Advocacy; Joshua Morris				
4:10 – 4:30pm	How Many Times Should a Bullet Kill? Have You Switched to Copper?; Bill Vogel				
7 – 9pm				Icebreaker	

Icebreaker Theme:  
*Wildlife for All*