

Innovative strategies for creating and maintaining Oregon spotted frog habitat

Sarah Hamman; Ecostudies Institute
Laurence Reeves; Capitol Land Trust
Kiana Sinner; Thurston Conservation District



Oregon Spotted Frog (*Rana pretiosa*)

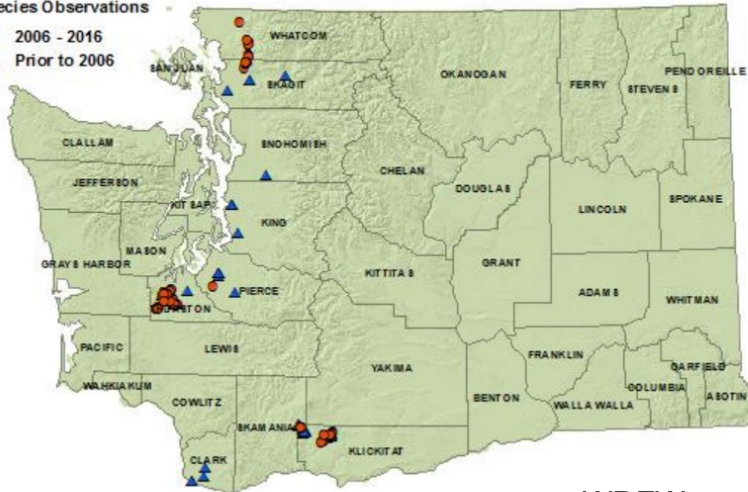
Oregon spotted frog (OSF) is federally threatened and state endangered

Oregon Spotted Frog - Known Distribution

Species Observations

● 2006 - 2016

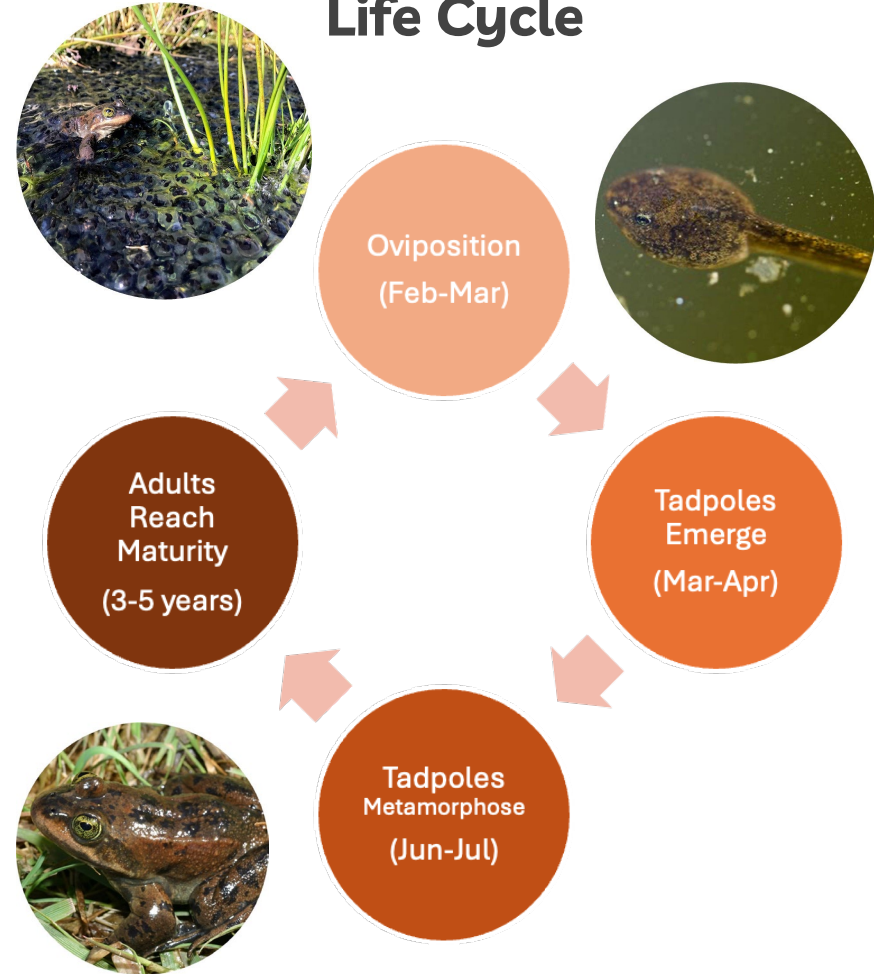
▲ Prior to 2006



WDFW



Life Cycle



Habitat Requirements & Threats

- **Oviposition:**
 - Shallow pools (5-20cm) and short-statured vegetation
 - Water surface exposed to direct sunlight
- **Tadpoles:**
 - Channels of connectivity between pools
- **Adults:**
 - Deep water connected to breeding areas
- Reed canarygrass (RCG) is major threat to habitat & removal is extremely labor intensive
- Many occurrences are on private lands, making restoration more challenging



1

Grazing for OSF

- Strategically applied grazing at a wetland preserve has created and maintained OSF oviposition habitat with no detrimental impacts on water quality and dramatically reduced labor inputs.



Engaging Landowners in OSF Conservation

- This interagency approach has included building a habitat suitability model, mailing out targeted surveys, and hosting community listening sessions. These approaches were used to build trust and highlight potential opportunities in the community.



OSF Restoration at Blooms Preserve

- The Blooms Ditch Preserve restoration project created habitat for federally endangered Oregon spotted frog and paved the way for experimental restoration.



2

3



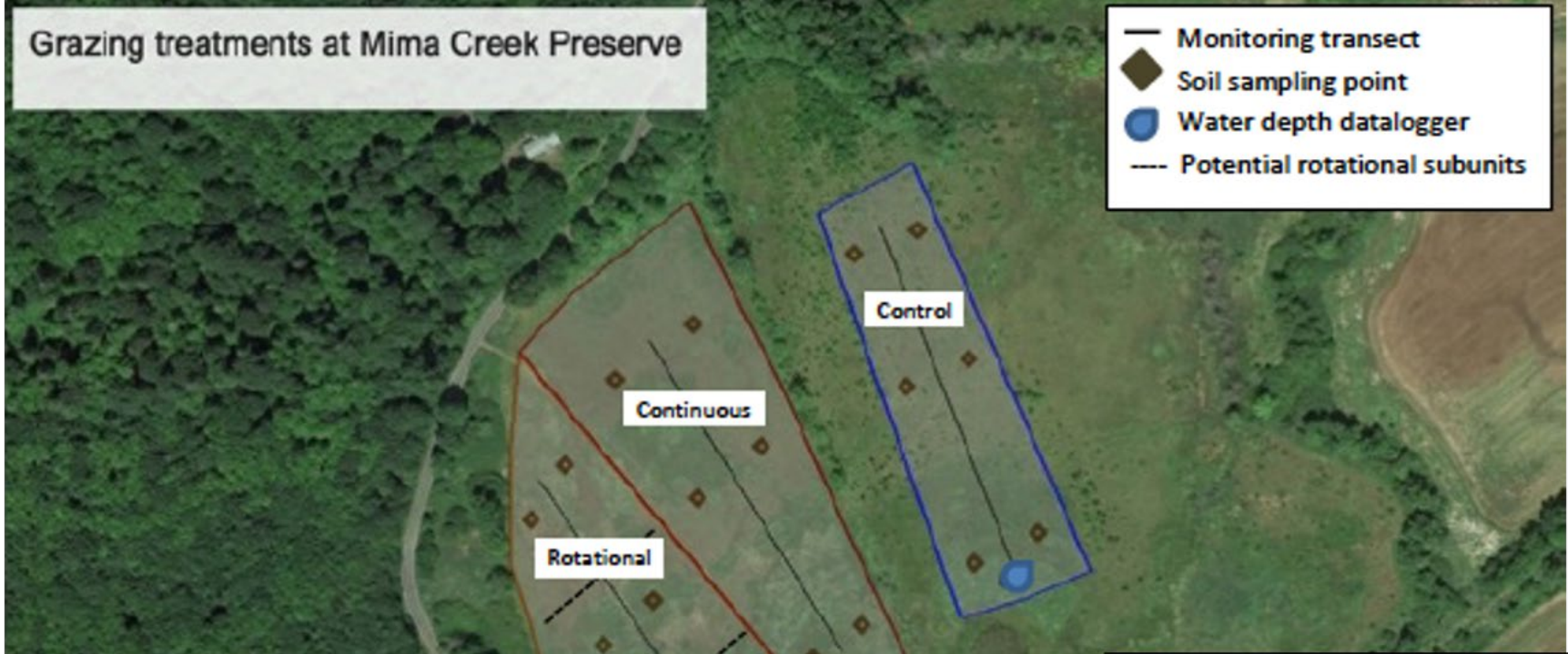
Grazing for OSF

Collaborators: Melissa Habenicht (Ecostudies Institute), Sanders Freed (Center for Natural Lands Management),
Jake Yancey (Tracking Y Ranch), Carri LeRoy (The Evergreen State College)
Funded by: U.S. Fish and Wildlife Service



Grazing treatments at Mima Creek Preserve

- Monitoring transect
- ◆ Soil sampling point
- Water depth datalogger
- Potential rotational subunits



Vegetation Height & Thatch Depth during Oviposition Period (Feb-Mar)



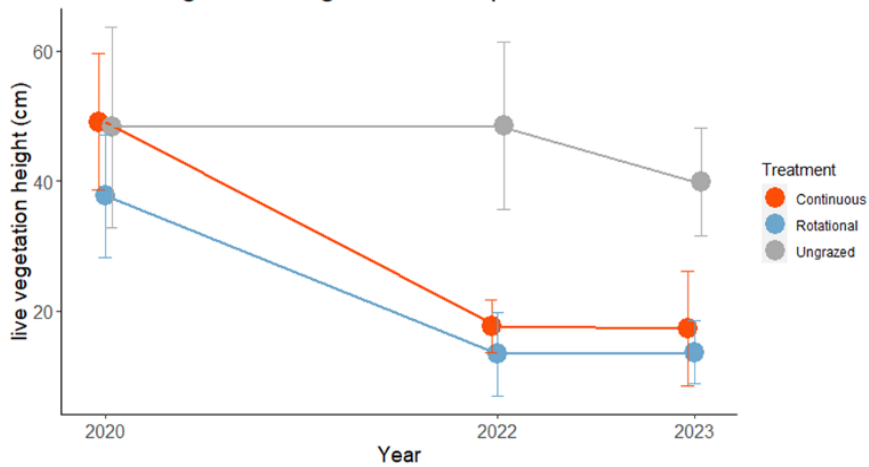
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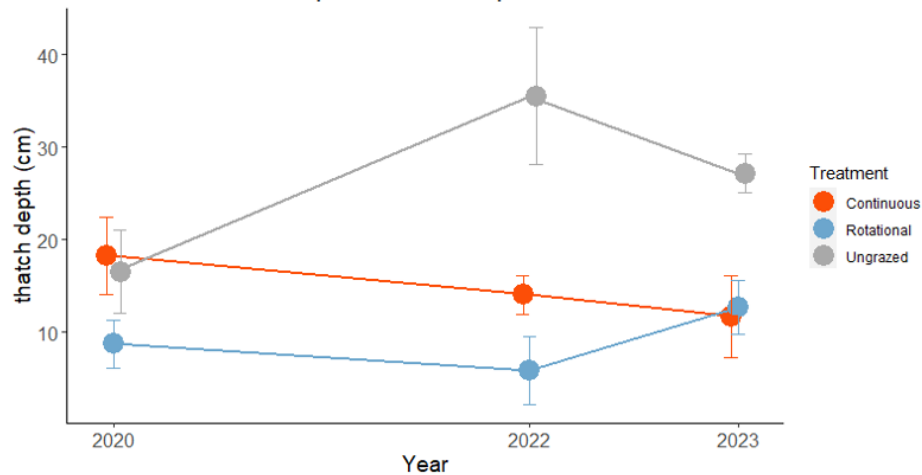
CONTINUOUS

ROTATIONAL

Vegetation height in OSF oviposition zone



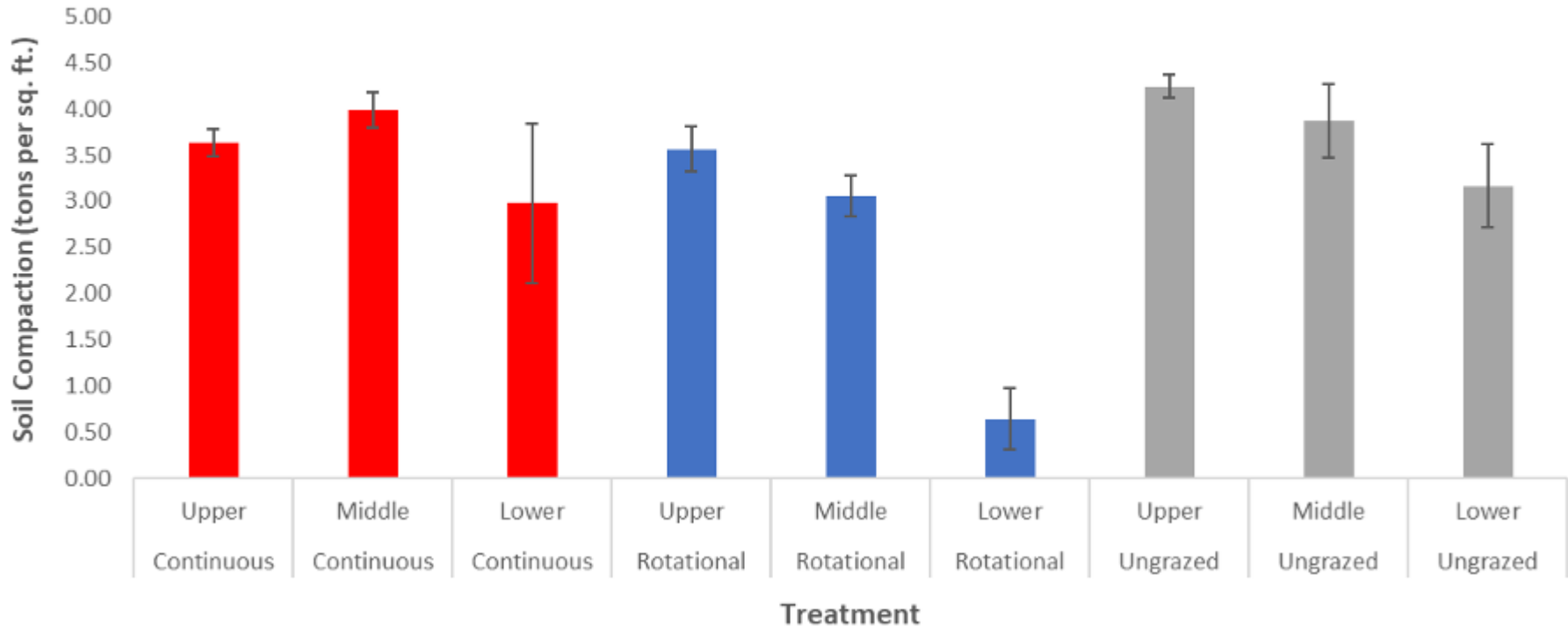
Thatch depth in OSF oviposition zone



Soil compaction across grazing treatments



2023 Soil compaction across treatments and paddock locations



Grazing treatment effects on water quality

Measured in oviposition areas

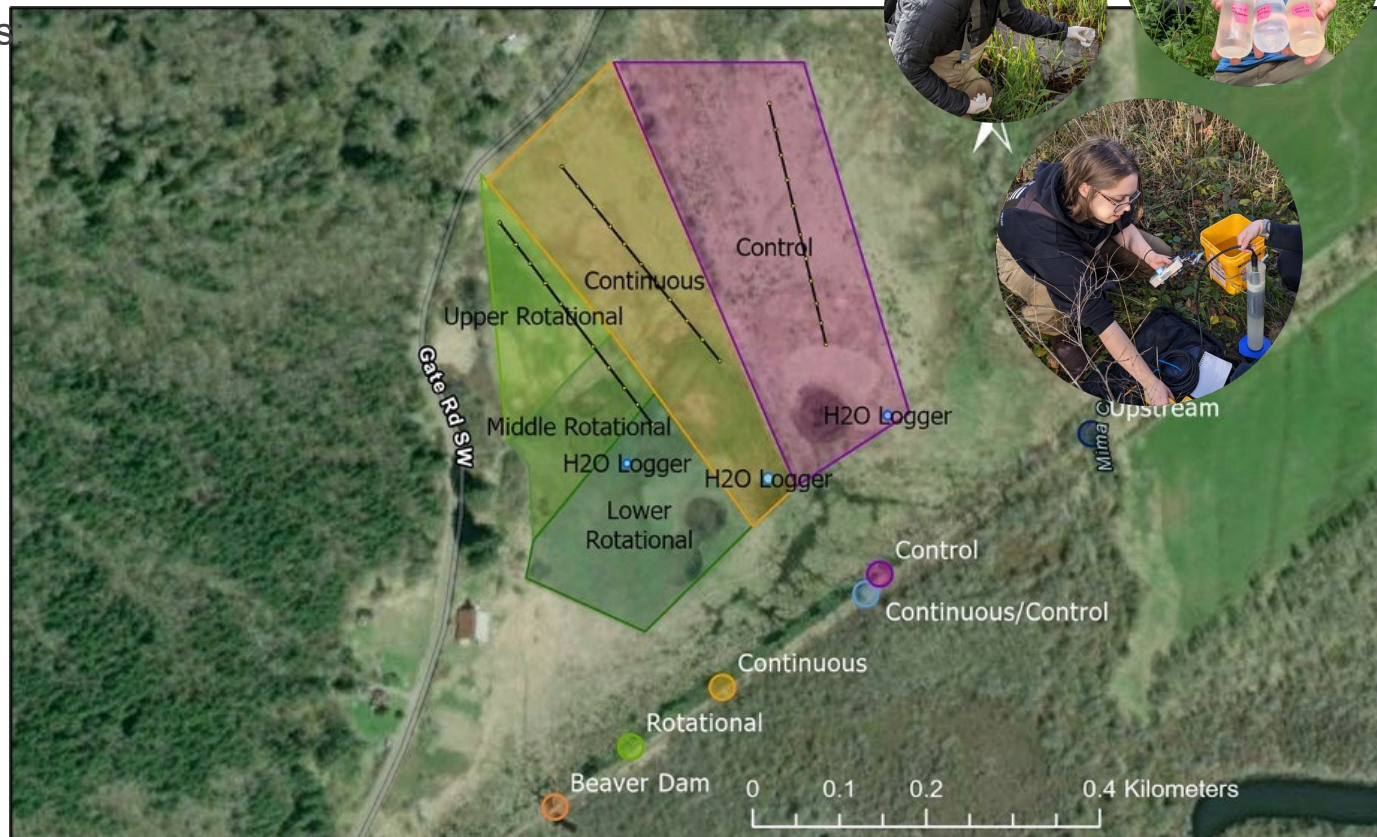
- Dissolved oxygen
- Fecal coliform
- Total phosphorus

Measured at in-stream sampling points:

- pH
- Temperature
- Dissolved oxygen
- Specific conductivity
- CDOM

Measured in deep wetland reaches:

- Nitrate
- Phosphate
- Ammonia



Done in partnership with TERC. Thanks to Carri LeRoy, Paris Lamoureux, Sylvia Higb, Jeffrey Bradshaw

Grazing treatment effects on water quality

Measured in oviposition areas:

- Dissolved oxygen
- Fecal coliform
- Total phosphorus

After 3 years of grazing treatments:

Grazing Treatment	Dissolved Oxygen (mg/L)	Fecal Coliform (CFU/100ml)	Phosphorus (mg/L)
Ungrazed	10.42 ± 0.05	3.17 ± 2.17	0
Continuous	10.58 ± 0.08	9.43 ± 5.33	0
Rotational	10.87 ± 0.04	15.80 ± 3.17	0.02 ± 0.01

Measured at in-stream sampling points:

- pH
- Temperature
- Dissolved oxygen
- Specific conductivity
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Measured in deep wetland reaches:

- Nitrate
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Grazing treatment effects on water quality

Measured in oviposition areas:

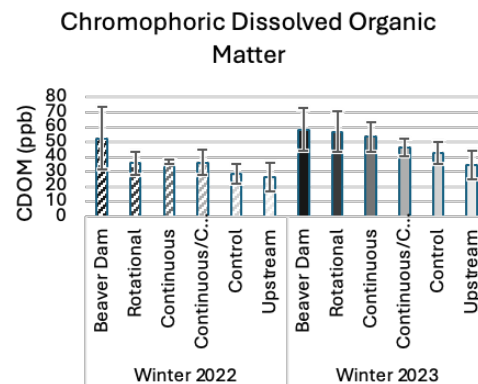
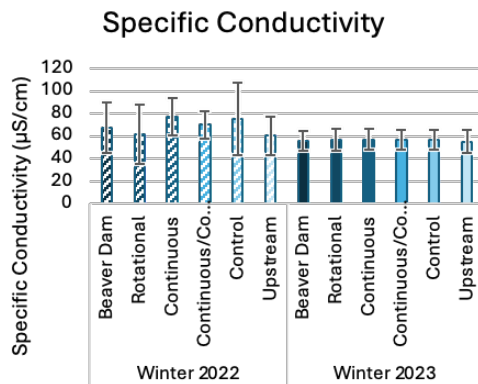
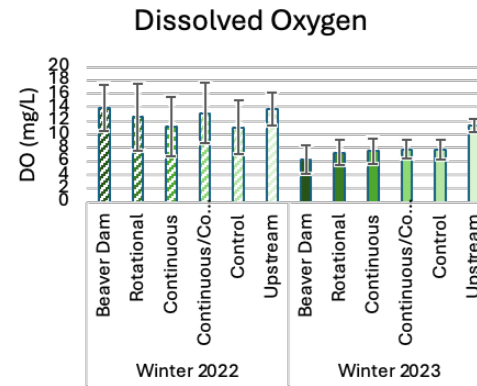
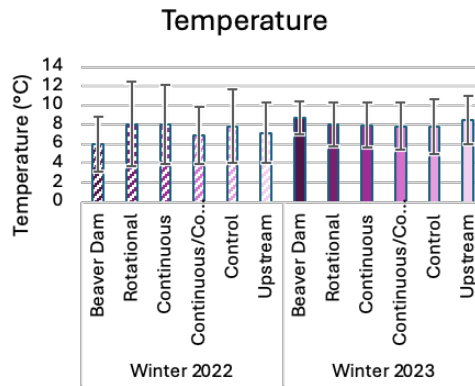
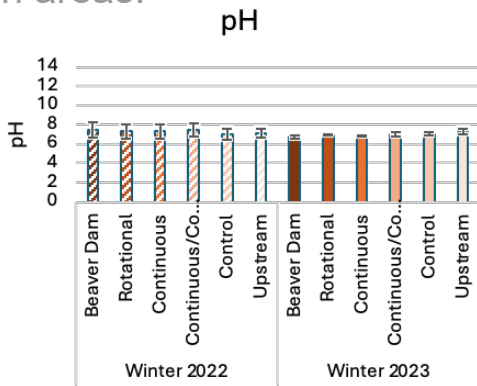
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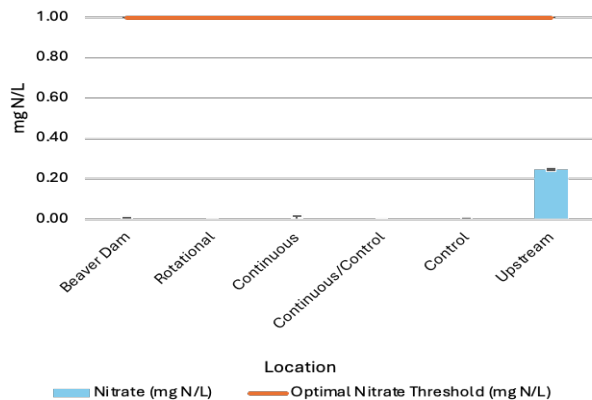
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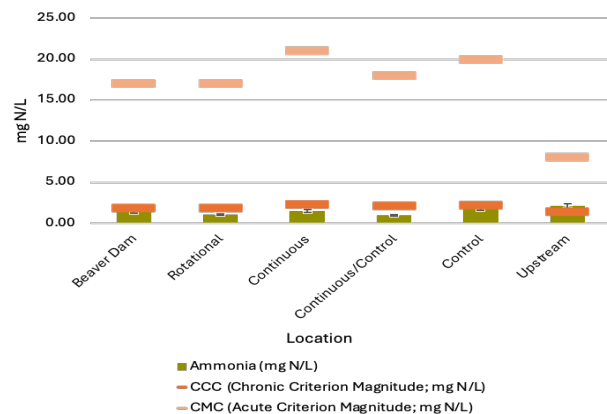
Measured in deep wetland reaches:

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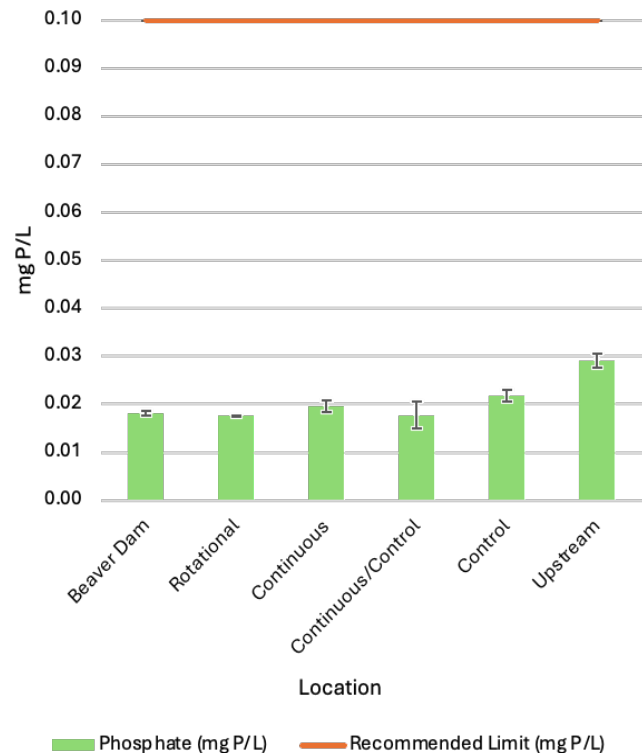
Nitrate Analysis



Ammonia Analysis



Phosphate Analysis



Summary and Next Steps

- Both grazing treatments reduced thatch depth
- Grazing created ideal vegetation heights for oviposition periods
- No impacts on soil compaction
- No major impacts to water quality

Due to these results the 'control' area will be grazed using the 'continuous' grazing method (2-3 weeks of grazing in late August to early Sept) to remove reed canary grass and create oviposition habitat



Engaging Landowners in OSF Conservation

Collaborators: Riley Andrade, U.S Fish & Wildlife; Nick George; U.S Fish & Wildlife; Cassie Doll, U.S Fish & Wildlife;
Mara Healy, Thurston Conservation District; Max Lambert; Nature Conservancy
Funding: Chehalis Basin Strategy – Aquatic Species Restoration Plan





Engaging with Landowners

- Better understand concerns, preferences, and barriers.
- Build trust
- Inform program design
- We engaged and listened:
 - Educational workshop
 - Landowner survey
 - Listening session
 - Habitat Suitability Model



Landowner Survey

- 11% Return rate
- Sociodemographic information
- Property information and landscape values
- Perceptions and attitudes about endangered species
- Likelihood of enrolling in an OSF program
- Program features that would increase residents' willingness

Section 2 of 3: Your perspectives on wildlife and wildlife management

5. We would like to understand more about your views on wildlife species that risk becoming extinct (or disappearing), known as endangered species. How strongly do you disagree or agree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. It is important to protect endangered species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Economic growth should be given priority over endangered species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Landowners have an obligation not to harm endangered species on their property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Landowners should be compensated for having endangered species on their property	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I agree with the original intent of the Endangered Species Act	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. To what extent do you trust the following agencies or groups to do what is right for your area's fish, wildlife, and natural resource management?

	Almost Never	Some of the Time	Neutral	Most of the Time	Almost Always
a. Federal government wildlife agencies (Ex. U.S Fish & Wildlife)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. State government wildlife agencies (Ex. Washington Department of Fish & Wildlife)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. County government (Ex. Thurston County)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Local-level conservation agencies (Ex. Conservation District)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Non-profit organizations and environmental groups (Ex. Land trusts)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Community or grassroots organizations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Collaborative groups representing multiple partners	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Please list the conservation or wildlife management organizations or agencies you prefer to work with:

8. What could organizations or agencies do to be better partners?

9. Oregon spotted frogs are an endangered frog species native to areas in Thurston County. How familiar are you with this species?

	Not at all Familiar	Not Familiar	Not sure	Familiar	Very Familiar
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. We would like to understand your beliefs about Oregon spotted frogs or similar frog species in the Pacific Northwest. To what extent do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
a. I like knowing that wildlife like Oregon spotted frogs are nearby, even if I don't always see them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. The presence of wildlife species like Oregon spotted frogs on my property would be problematic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. It is important to have healthy populations of wildlife like Oregon spotted frogs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Oregon spotted frogs are worth protecting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What we Learned!

Perceptions & attitudes

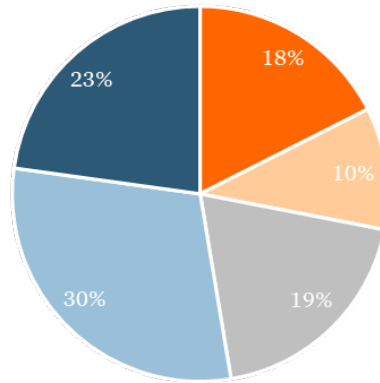
- **Priorities**
 - Stewardship & Habitat Enhancement
 - Decision Making Authority
 - Property Value
 - Property Rights



What we Learned!

Likelihood of Enrolling

How willing would you be to enroll in a program where you were given support to provide habitat for relocated Oregon spotted frogs on your property?



Very Unlikely Unlikely Neutral Likely Very Likely

What we Learned!

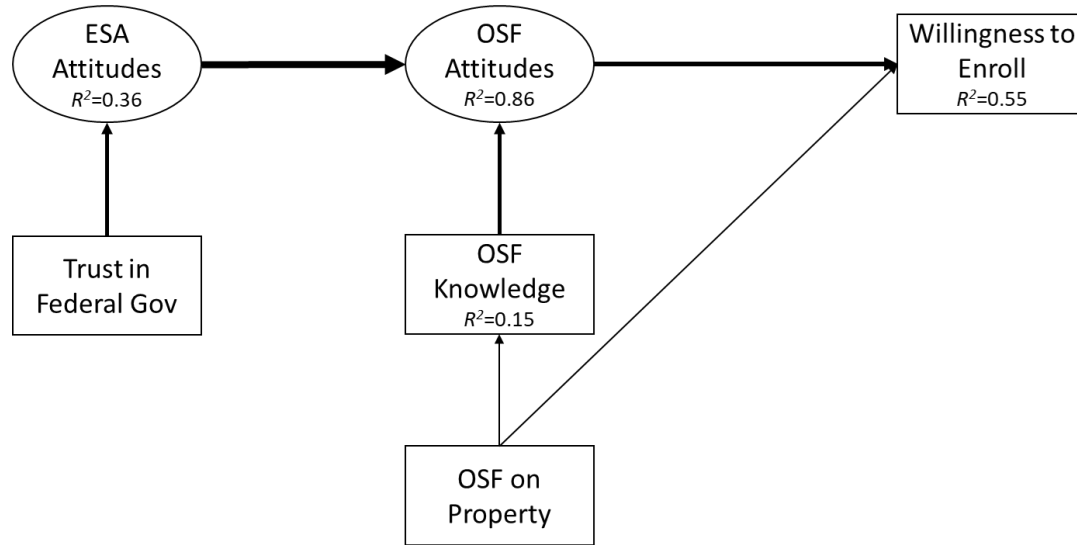
Collaborative Conservation

- **Agencies**
 - Thurston Conservation District
 - WDFW
 - Capitol Land Trust
- **Support**
 - Respect
 - Communication



What we Learned!

Likelihood of Enrolling

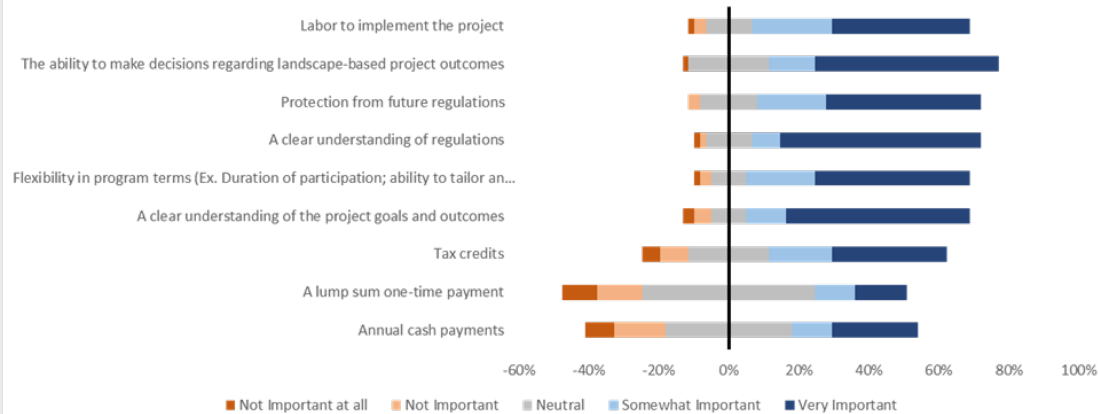


- Willingness is strongly driven by attitudes
- Trust in federal government is connected to attitudes
- Familiarity with OSF shapes positive attitudes

What we Learned!

Motivations and Barriers

We want to understand what components of an Oregon spotted frog habitat stewardship program would be most important to you. What would make it easiest for you or increase your likelihood of participate in such a program?



- Regulatory and program clarity
- Autonomy
- Implementation support
- A clear understanding of regulations
- Financial support is a secondary barrier

What we Learned!

- **Building Trust & Relationships**
 - Increased landowner engagement
 - Multi-agency collaboration
 - Property surveys increased for species
- **Building Understanding & Program Design**
 - Challenged assumption about monetary incentives
 - Highlighted importance of clarity and autonomy
 - Need for landowner assurances
 - Knowledge and attitudes towards the species were key
 - Investing in educational and experience components

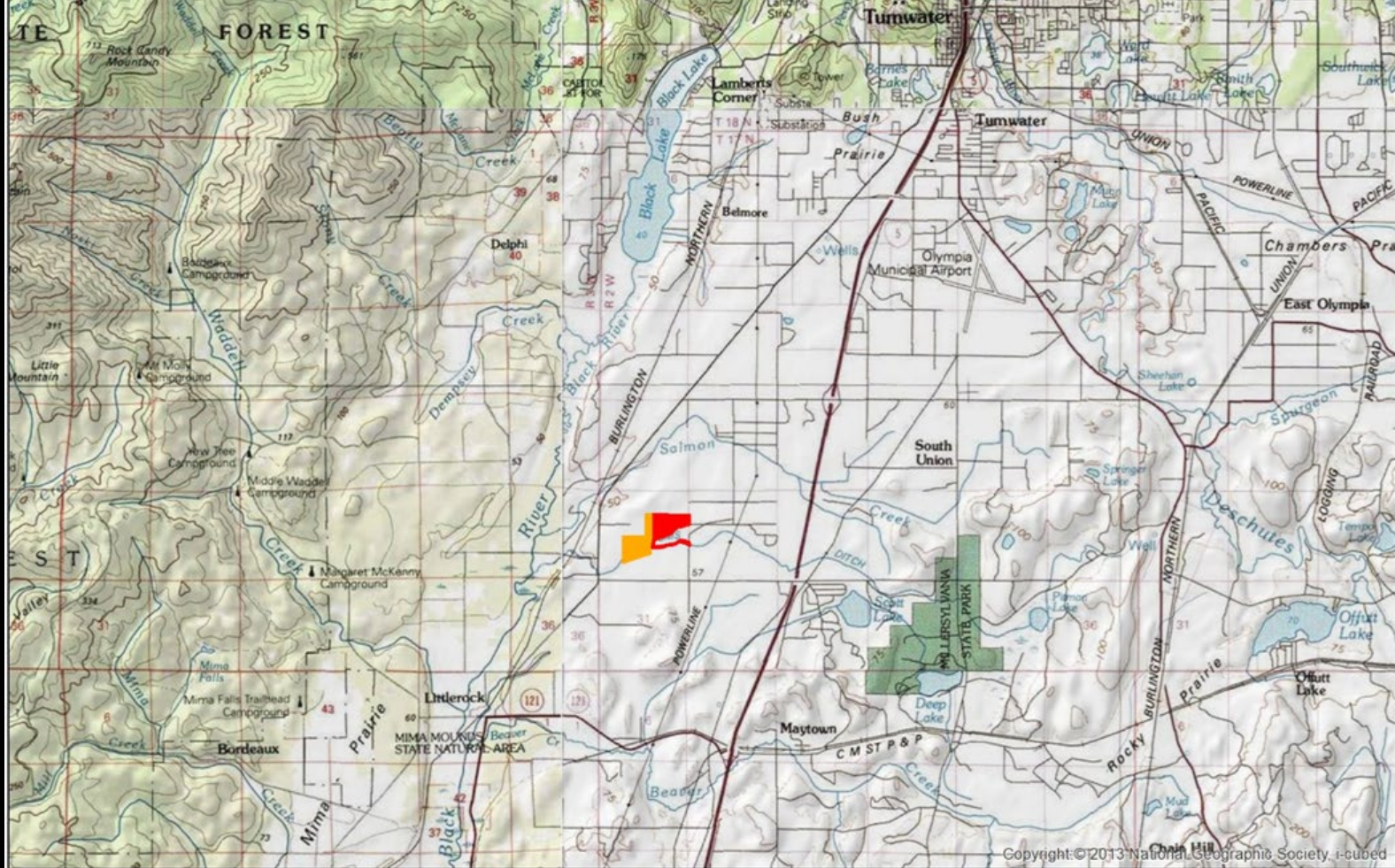




OSF Restoration on Blooms Preserve

Funding: Chehalis Basin Strategy Aquatic Species Restoration Plan

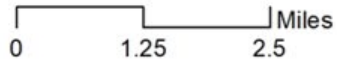
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Map created by Capitol Land Trust with data from Thurston County. For general location purposes only.

- Proposed 76-ac acquisition
- Conserved 60-ac parcel by CLT









-  Blooms Preserve boundary
-  Woody Plant Buffer
-  LWD in Blooms
-  Blooms Ditch
-  Live Stakes Along Blooms Ditch
-  Ponds
-  Breeding Shelf
-  Reed Canary Control Area





























We can't play the video for 2023.4.4. Please see young
insects by ensuring settings aren't restricted. You can still
listen to the audio.

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Is Artificial Pond Construction an Effective Method of Creating Suitable Oviposition Habitat for Oregon Spotted Frog?

Collaborators: Laurence Reeves, Capitol Land Trust; Tom Terry; Carrie Leroy, The Evergreen State College; Mike Ruth, The Evergreen State College

Data Collection

- **Hydrology Monitoring**
 - Water recession rate
 - Water temperature
 - Water depth

- **Vegetation Monitoring**
 - Vegetation height
 - Vegetation composition
 - Vegetation cover
 - Vegetation richness



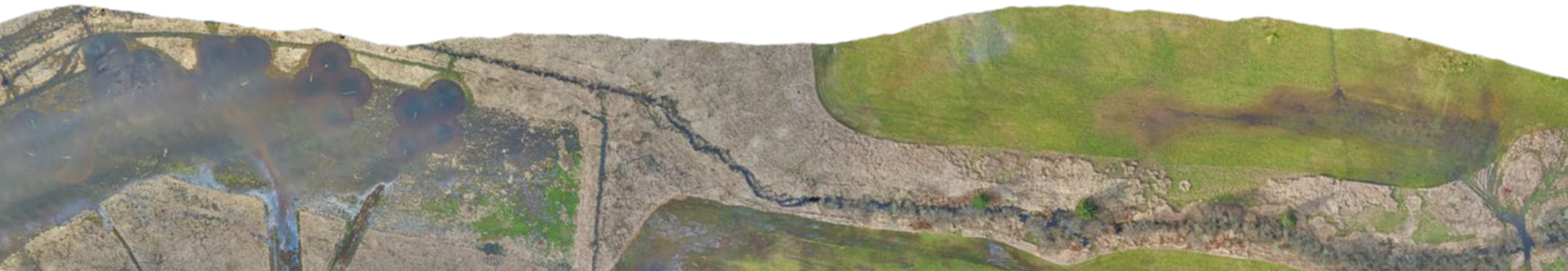
Data Analysis & Results

- **Data Analysis**

- Drone flights
- GIS spatial mapping
- Hydrographs

- **Results**

- % of appropriate oviposition habitat
- Management implications
- Differences in oviposition habitat between natural and constructed wetlands



What We're Learning

- **Constructed Wetlands**
 - Portions of the constructed wetland have suitable oviposition habitat
 - Yearround permanent water in ponds creates ideal summer habitat
 - The breeding shelves, ponds, and physically altered locations do not have appropriate veg heights
- **Natural Wetlands**
 - The majority of suitable oviposition habitat lies within the adjacent pasture
 - RCG thatch covers a significant portion of habitat
- **Hydrology**
 - Water level has significant fluctuations
- **OSF Oviposition**
 - OSF laid eggs in the constructed wetland!
 - Egg masses had to be moved two times
- **Challenges**
 - Bullfrogs are present



Connect with us!

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