

Trinity River Watershed Council

March 12th, 2024 at 10:00am – 12:00pm

TCRCD Conference Room, #30 Horseshoe Lane, Weaverville

Our Mission:

To protect, enhance, restore and revitalize the watershed through collaborative efforts that leverage external resources, work toward common goals, educate and engage community stakeholders, address natural resource issues, and support healthy ecosystems for future generations.

Agenda

- 10:00-10:10** Welcome and Introductions
- 10:10-10:45** Guest Speakers Topic: Non-Native Fish Removal from Alpine Lakes with Justin Garwood - CDFW Aquatic Species Coordinator, Braden Herman - CDFW High Mountain Lakes Aquatic Species Biologist, and Adam McKannay – CDFW Inland Fisheries and Wild Trout Supervisor
- 10:45-11:55** Partner Updates
- a. USFS – Shasta Trinity National Forest
 - b. USFS- Six Rivers National Forest
 - c. Bureau of Land Management (BLM)
 - d. California Department of Fish and Wildlife (CDFW)
 - e. Natural Resources Conservation Service (NRCS)
 - f. Trinity River Restoration Program (TRRP)/ Bureau of Reclamation (BOR)
 - g. Trinity County
 - h. Hoopa Tribal Fisheries
 - i. Yurok Tribal Fisheries
 - j. Tsnungwe Tribe
 - k. Nor Rel Muk Wintu Nation
 - l. Trinity County Resource Conservation District
 - m. The Watershed Research and Training Center
 - n. 5 Counties Salmonid Conservation Program/ Northwest California Resource Conservation & Development Council
 - o. Trinity County Fish and Game Commission
 - p. Trinity County Agricultural Alliance
 - q. Flowra
 - r. New Attendees
- 11:55-12:00** Close

Next Meeting is June 11th, 2024 at 10am-12pm

Virtual Meeting Information

Zoom link: <https://us02web.zoom.us/j/89707228772?pwd=WUo1VW5hS2x0UC85ODE4dFViNEFYUT09>

Meeting ID: **897 0722 8772**

Passcode: **96093**

+16694449171,,89707228772#,,,,*96093# US +16699009128,,89707228772#,,,,*96093# US (San Jose)

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net

Trinity River Watershed Council – March 12th, 2024

Meeting Notes

Attendance

In-person (2):

- Annyssa Interrante– Watershed Program Coordinator Trinity County Resource Conservation District (TC RCD)
- Chris Losi– Flowra

Online (27):

- Adam McKannay– Supervisor for Inland Fisheries and Wild Trout Program California Department of Fish & Wildlife (CDFW)
- Adrien Keys– Policy Director Trinity County Agriculture Alliance (TCAA)
- Veronica Yates– Riparian Ecologist Hoopa Valley Tribe/ Trinity River Restoration Program (TRRP)
- Amelia Fleitz– Natural Resource Specialist Fisheries Department United States Forest Service (USFS)
- Chris Cole– District Conservationist Natural Resources Conservation Service
- Christine Burchinal– Watershed Stewards Program Corpsmember TC RCD
- Dave DeLange– Trinity Public Utilities District Vegetation Program Manager
- David Colbeck– Trinity County Natural Resources Division
- Galen Anderson– Hydrologist USFS
- Gregory Pasternack– Professor at UC Davis in River Science
- Josh Smith– Program Director Watershed Center
- Helen Bowman– Environmental Scientist CDFW
- Justin Garwood– CDFW Region I Fisheries
- Braden Herman– Environmental Scientist CDFW
- Karla Avila– Executive Director TCAA
- Kate Blanchard– Senior Environmental Scientist CDFW
- Kellan Korcheck– Environmental Consultant Flowra
- Kyle DeJulio– Senior Fisheries Biologist Yurok Tribe
- Margo Moorhouse– Fisheries Biologist Pacific Watershed Associates
- Mike Dixon– United States Bureau of Reclamation Executive Director TRRP
- Mike McFadin– Recreation Staff Officer USFS
- Monique Rea– Partnership Coordinator Shasta-Trinity National Forest USFS
- Nathan McCanne– Fisheries Program Associate Watershed Research and Training Center (WRTC)
- Patrick Flynn– Trinity County Natural Resources Division
- Scott Harding– American Whitewater
- Kelly Sheen– District Manager TC RCD
- Ellen McGehee– Prescribed Fire Operations Watershed Center

Total Attendance: 29 people

Meeting start: 10:03am

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net

Trinity River Watershed Council – March 12th, 2024

Guest Speaker Topic: “Frogs and Fish: Reversing widespread legacy impacts of introduced sportfish on declining amphibians in glacial lake basins of the Klamath Mountains,” presented by Justin Garwood and Braden Herman

- **Pleistocene Glaciers left hundreds of lake basins behind**
 - High density of lakes created through glacier processes
 - In the Mid-Klamath region, especially in the Trinity Alps
 - Over 300 lakes
 - Very few non-glaciated natural lakes
 - Very unique that the vast majority of lakes were created from glacial processes because this is the western-most glaciated landscape in the US south of the Olympic Peninsula
 - Lakes are great to visit and recreate in, but they are also great biodiversity centers in these higher elevation zones
 - Diversity in lake sizes, sometimes in groups
 - Lakes in area with moist meadow edges
 - Thousands of ponds created by glaciers
 - Range from temporary to permanent with all different shapes and sizes
 - High elevation meadow systems
 - Created by biological processes with decaying plant material that builds up heat
 - Habitat used by native species
 - Store water throughout the summer, just like lakes and ponds
- **Klamath Mountains Post Ice Age Colonization**
 - 2 amphibians came in from the Cascades and they colonized that high-elevation zone. These are high elevation specialists, so they are tied to the high-elevation, glacial landscape.
 - Long-toed Salamander
 - Cascades Frog
- **Klamath mountain lake ecosystems**
 - Systems are more simple
 - Higher elevation
 - Snow-fed drainages
 - Covered in snow and ice in winter, and melt in spring
 - Relatively short system
 - Productivity lower, more simple
 - Food Chain:
 - Base of food chain: primary consumers, zooplankton
 - Feed a lot of aquatic macroinvertebrates
 - Aquatic Macroinvertebrates: feed terrestrial consumers and amphibians
 - Top predator: Garter snake
- **Stocking chronology across lakes of the Klamath Mountains**
 - All lakes were fishless prior to being stocked, as these fish could not migrate here naturally
 - 88% of 370 fishless waters were eventually stocked with trout!
 - 1913: Mt Shasta Fish Hatchery started holding brood stock and stocking mountain lakes
 - Used horse-packing and truck to access lakes to stock

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net

Trinity River Watershed Council – March 12th, 2024

- Great Stocking Event: World War II Ends– Air Planting Initiates
 - Dramatic rise in stocking due to new technology
 - Stocked lakes with fish using airplanes
- 1964: Wilderness Act of 1964
 - Vast majority of lakes had received trout
 - Highest value of lakes was through recreational fisheries
- After 1960s, most lakes stocked with fish
- **Brook Trout**
 - Actually a char; native to eastern North America
 - Adapted to cold streams and lakes
 - Fall spawner in streams and lakes
 - Feeds on invertebrates and zooplankton, also piscivorous
 - Stocking period: 1912-2016
- **Brown Trout**
 - Native to Europe/ north Africa
 - Fall spawner, need streams to spawn
 - Formidable predator with a diverse diet, large adults are piscivorous
 - Stocking period: 1917-2001
- **Rainbow trout**
 - Regionally native
 - Adapted to cool mid-elevation streams
 - Spring spawner, needs streams to spawn
 - Feeds on invertebrates
 - Stocking period: 1930- Present
- **Klamath Mountain Lake Ecosystems + Stocked Trouts**
 - Fish added to lake ecosystem purely for recreational value
 - Fish do not just live in a vacuum for people to catch, the system becomes a lot more complex when you add fish to it
 - They eat amphibians and zooplankton
 - King fishers and osprey eat these fish and they likely did not occur in mountain lakes before these fish were there
 - Aquatic garter snake, fish hunting specialist, has evolved to eat fish
 - River otters have occurred up in the Klamath Lakes
 - Feeding on fish and amphibians
- **Amphibians with Chemical defenses** (fish won't eat them)
 - Rough-skinned Newt
 - Western Toad
- **Cascades frog (*Rana cascade*)**
 - Naive to this novel predator
 - Life history:
 - High-elevation specialist
 - Lake and pond breeder

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net

Trinity River Watershed Council – March 12th, 2024

- Long-lived
- Status:
 - California Species of Special Concern (since 1992)
 - Petitioned for California ESA threatened status (2017), currently in status review
- Major threats:
 - Invasive fishes
 - Habitat loss/alterations
 - Drying of habitats
 - Climate change
 - Roads
 - OHV damage
 - Disease
 - Ex: chytrid fungus
- **Climate Change impacts on Cascades Frog**
 - Less water in landscape causes more wetlands to dry up
 - This frog is wetlands specialists
 - Highly connected to water
 - Temperatures are rising, especially since 1980
 - Precipitation has been dropping precipitously, leading to a much drier landscape
 - Glaciers going away, and they are the main water source for high-elevation wetlands
 - Wetlands storage capacity
 - When wetlands dry, amphibians cannot persist
- **Hydrology is Destiny...**
 - Fish need permanent waters
 - Amphibians need intermittent to permanent water to persist, but it is lower climate risk
 - When all those waters are occupied by a predator that they don't know how to deal with it becomes difficult
- **Relative Surface Area of Klamath Mountain Lakes Based on Historic Cascades Frog and Stocked Nonnative Trout Disruptions**
 - Most lakes have been stocked and have both trout and frog
 - Some lakes only have fish, and very few lakes were never stocked and have cascades frogs present
 - 98% of lakes were stocked with invasive trout
 - Frogs are over 3x to exist in a lake without fish than a lake with fish
- **Stocking Cessation Chronology Across Lakes of the Klamath Mountains**
 - Around 20% of lakes were never stocked again after the 'Great' Airplane Stocking Event in 1949
 - CDFW sued for stocking practices in mid 2000s
 - CDFW Hatchery stocking EIR published around 2010
 - Started stocking just rainbow trout after 2016
 - Wanted to see what happened after they stopped stocking. Would amphibian populations replenish?
- **State Wildlife Grant 2021-2023**
 - Survey for Cascades Frogs across their historic California Range
 - Survey for non-native fish across the historic range of Cascades Frogs

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrwd.net

Trinity River Watershed Council – March 12th, 2024

- Compare survey results to previous robust effort over 20 years ago
- Use current data to inform a new range-wide fisheries management strategy
- **Survey Methods**
 - Amphibians and Reptiles: visual encounter surveys
 - Fishes: gill netting and visual encounter surveys
- **36 (very) Tough Surveyors!**
 - >2000 person-days in the Wilderness
- **2020-2023 Survey Effort**
 - Surveyed ~1100 sites across 179 basins
 - >500 identical sites surveyed between the 2 periods: (1999-2002) and (2021-2023)
 - 184 lakes gill net sampled for trout
- **Cascades Frog Site Occupancy in the Klamath Range Across 555 Sites Separated by ~20 Years**
 - Current survey found them at 20% fewer sites relative to 20 years ago
 - Split up into four different sub-regions
 - Trinity Alps has high-density and high-quality habitat
 - Dramatic declines in distribution over past 20 years despite changes in management
- **Current cascades frog survey counts across 555 Klamath mountain sites are ~50% lower than those observed ~20 years ago.**
 - Trinity alps holds strong numbers
 - Other areas show declines in distribution
- **Fisheries Status within the Klamath Range**
 - Stocking History
 - 285 (88%) historically stocked
 - 97% of large lakes were historically stocked.
 - Current Trout Population Status
 - Present in 218 (76%) of 285 historic stocked waters.
 - Natural reproduction in at least 78% of water, especially in brook trout
 - No longer present in 67 (24%) of historically stocked waters
 - More brook trout than brown trout or rainbow trout
- **Relative surface area of Klamath mountain lakes based on current nonnative trout and current cascades frog distribution**
 - 90% of lake area currently has trout
 - We have lost a lot of fish that are in small lakes
- **Current Trout Distributions**
 - 323 waters in the Cascades Frog range
 - 285 historically stocked with trout
 - 218 still contain trout (24% went fishless naturally or through previous restoration)
- **Management Options**
 1. Passive: Maintain healthy naturalized trout populations
 2. Active: resume trout stocking in select lakes
 3. Passive: Maintain currently fishless waters
 4. Active: remove trout at critical climate-resilient locations

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrwd.net

Trinity River Watershed Council – March 12th, 2024

- **Considerations for managed fisheries in high lakes**
 - What is best for the fish?
 - Fish health
 - Fish persistence
 - Natural vs. stocked populations
 - What is best for the angler?
 - Popularity
 - Hiking distance
 - Multiple species
 - What is best for the amphibians?
 - Breeding habitats
 - Adjacent permanent water bodies
 - Dispersal corridors
 - Fish removal in key habitats
 - Genetic isolation can occur
- **Cascades frog metapopulation structure**
 - Cascades frog habitats vs. known cascades frog distribution
 - Gaps in populations: dispersal corridors
- **Initial Lake Screening for Restorations**
 - Waters in Cascades frog range=323
 - Current trout presence=217
 - Feasibility (<3 ha, <10 m deep)= 124 potential lakes to restore
 - Multi Criteria Decision Analysis (MCDA) analysis on 124 lakes
 - MCDAs used in wildlife resources for balancing finite resource use by multiple conflicting interest groups
 - Finite resource: permanent water bodies
 - Interest groups: anglers, cascades frogs, trout
 - List of 25 potential restorations
- **Final MCDA Results**
 - Something that is good for fisheries is not very good for frogs, and something that is great value for frogs may not be high value for fisheries
- **Restoration: 5 Regions of Focus**
 - NE Marble Mountains (2 sites)
 - Russian Wilderness (1 site)
 - Northern Trinity Rim (2 sites)
 - Scott-Eddy Shasta-Trinity Mountains (3 sites)
 - Upper Deadfall Lake (2023)
 - Rock Fence Lake
 - Timber Lake
 - Scott Lake
 - Bull Lake (2023)
 - Lower Parks Creek Lake (2023)

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrwd.net

Trinity River Watershed Council – March 12th, 2024

- A lot of fish on the landscape
- Trinity Alps (1 site)
 - Salmon Lake (delayed due to wildfire)
 - Connecting the White Trinities and the Red Trinities
 - Two different geology-types but two critical areas to maintain
 - Forbidden Lakes
 - Seven Up Lake
 - Doe Lake
- **Effort in a broader context**
 - 8.5 out of 145 feasible hectares (8 out of 124 lakes) will be restored in the next few years
 - 8.5 hectares out of 805 total hectares (8 out of 211 lakes) of fish bearing waters to be restored
- **What to expect at Restoration Sites**
 - Gill Nets may be present in the water bodies during restoration
 - Look for signs posted by CDFW indicating presence of nets
- **Management Moving Forward**
 - Redoing USFS fishing guides from the 1960s/70s
 - 1. Maintain Healthy Naturalized Trout Populations
 - 1. Remote, little used water bodies
 - 2. Resume Trout Stocking in Select Lakes
 - 1. Popular, high use lakes for public benefit
 - 3. Maintain Currently Fishless Waters
 - 1. Free frog restoration!
 - 4. Remove Trout at Critical Climate-Resilient Locations
 - 1. Finalize sites began in 2023 in the coming seasons, start a few additional sites

Comments in the chat:

- Justin Garwood: Justin.garwood@wildlife.ca.gov
- Justin Garwood: braden.herman@wildlife.ca.gov

Partner Updates

- USFS – Shasta Trinity National Forest:
 - The Fisheries department is working on supporting NEPA for the Hyampom Project (fuels reduction in and around Hyampom).
 - Supporting the WRTC in the Bowerman and Corral Gulch projects
 - USGS has reached out and they are evaluating if the current gauge network is meeting our needs and we can propose changes to the network (adding or removing certain sites)
 - Need to submit requests by April 5 as to which sites we would like to see turned on or if there are new sites we would like to see developed
 - Could have a conversation later regarding this topic in a separate meeting

Comments in the chat:

- Amelia Fleitz: amelia.fleitz@usda.gov

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net

Trinity River Watershed Council – March 12th, 2024

- USFS – Six Rivers National Forest – not present
- BLM – not present
- CDFW:
 - Going through a few staff changes, a lot of temporary acting assignments in the program, acting as supervisors
 - New staff member hired to help with compliance of existing Lake and Streambed Alteration Agreements (LSAA), reaching out to people with existing agreements in Trinity County to chat with them on the status of compliance with their permit
- NRCS:
 - No updates for the group
- TRRP/Bureau of Reclamation:
 - Environmental Assessment (EA) for two projects:
 - Upper Conner Creek project
 - Maintenance activity for gravel-processing site in Lewiston.
 - Gravel and large wood augmentation EA
 - Developing a Programmatic EA for watershed restoration activities
 - Public document sometime this summer hopefully
 - Covers everything from in-stream restoration work in tributaries to water efficiency improvements and carcass augmentation, etc.
 - Watershed grant funding NFWF
 - Both applicants in Hayfork creek watershed
 - Events:
 - [March 19: TRRP Open House/ Public Meeting Upper Conner Creek project](#)
 - [April 6th: Invasive Plant Pull Volunteer Event](#) at the Junction City Campground with the TC RCD
 - [April 30 – May 2: Science Symposium](#)
 - Trinity County Weeds Working Group
 - Converting into a Weed Management Area
 - Would love to have your participation
- Trinity County (Natural Resources Division):
 - East Branch East Weaver Creek culvert replacement– moving forward
 - 5 Counties project that the Trinity County Natural Resources Division is looking to help spearhead as they have some funds to help implement it
 - Oregon St Sidney gulch retrofit– improving the inlet of that culvert which was damaged about five years ago
 - 5 Counties program
 - Oddfellows camp culvert has failed– seeking help or funding from group to help with this issue
 - All DG, very deep fill– maybe 30 feet or so
 - Private road
 - Significant concern to little grass valley creek and downstream fish and sediment concerns
 - If you would like to help with this situation, you may contact David Colbeck at dcolbeck@trinitycounty.org

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrwd.net

Trinity River Watershed Council – March 12th, 2024

- Hoopa Tribal Fisheries:
 - Happened upon 2000 untreated wooden posts
 - Offering to the community for free for use in BDAs or PALs
 - Hoopa needs to assess their needs within the valley first before opening it up for the public
 - Contact Veronica at vyates@usbr.gov or vyates.hoopafisheries@gmail.com to get in touch with the proper contact for this opportunity
- Yurok Tribal Fisheries:
 - Doing some stuff out of the basin right now
 - Through our co-management with the hatchery, have been working this winter to do carcass supplementation and remote stream incubators on Grass Valley Creek
 - Incubated just over 10,000 eggs in a remote stream incubator, which is essentially a streamside gravity-fed artificial redd
 - Have successfully hatched-out 98% of those and they are starting to volitionally enter Grass Valley Creek
 - This project was done as part of the RPMs from the HDMP at the Trinity River Hatchery, and it is a project that the Yurok is planning to expand in future years, including the additions of carcasses
 - BOR will be funding the expansion of the remote stream incubator project, and they expressed an interest in tying new release locations to restoration as newly available habitats are less likely to be populated fully and so they make for a good place to start reintroduction efforts
 - If anyone thinks they are doing a project in a reach or river that could support Coho oversummering, they can contact Kyle DeJulio at kdejuilio@yuroktribe.nsn.us about having remote stream incubators being part of the post-project implementation
 - Screw traps being put into the Trinity to monitor this year's outmigration of juvenile Chinook who should currently be emerging from the gravel
 - Weaver Creek Project
 - At a 90% design
 - Seeking funding for implementation from a few sources
 - Seeking funding for phase two of the Indian Creek project, which would address the valley section that is downstream from the project that was implemented in 2020
- Tsnungwe Tribe: not present
- Nor Rel Muk Wintu Nation: not present
- Trinity County Resource Conservation District (TC RCD):
 - Watershed Department has been working on the Upper Trinity Headwaters Assessment and Restoration Plan in partnership with the WRTC
 - Annyssa has been working on a Beaver Restoration Assessment with the Upper Trinity and that is starting to wrap up by the end of the Month
 - After paper wraps up, they will move forward with the identification of restoration sites and starting CEQA and NEPA
 - BDA assessments for Weaverville Community Forest
 - NEPAs available to start after that

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net

Trinity River Watershed Council – March 12th, 2024

- The RCD is hiring a Watershed Program Manager, contact Kelly Sheen at ksheen@tcrd.net
- The Trinity River Watershed Council is funded by a Department of Conservation (DOC) grant that is also funding the Upper Trinity Headwaters Assessment, and that funding expires in March of 2025. The group should be aware that without that funding, we do not have the Trinity River Watershed Council meetings. As we have all of our partnering agencies here today, please start thinking about ways that we can introduce more funding to continue these meetings past next year.
- Christine Burchinal, the Watershed Stewards Program Corpsmember with the TC RCD, will be hosting a Watershed Awareness Volunteer Event (WAVE) on May 18, 2024. More info will be shared in upcoming months.
- The Watershed Research and Training Center (WRTC):
 - The WRTC is currently a fiscal sponsor for the Klamath Meadows Partnership (KMP), a group of people interested in meadow restoration
 - Got a grant and hired Emily Cooper-Hertel as the new KMP coordinator
 - There are bi-monthly meetings, strategic visionary planning workshops in April, and will be working on meadow inventory protocols
 - If interested in joining this group, contact Josh Smith at josh@thewatershedcenter.com
 - Corral Gulch Project
 - Will be receiving some funding for implementation this summer 2024
 - This is a larger Indian Valley meadow restoration project, as Corral Gulch is a tributary of Indian Valley
 - Salt Creek Floodplain Restoration Project– major instream restoration project
 - Raising the streambed for groundwater recharge in the Hayfork Valley and floodplain expansion, habitat improvement, cold water enhancement
 - Applying for two different funding sources for implementation, might be getting one of them
 - Upper Trinity Headwaters Assessment
 - Focusing on meadow restoration using some tools from the KMP
 - Identified a running list of over 30 meadow restoration projects of varying sizes
 - Road upgrade projects
 - Coffee Creek area
 - Fire and fuels projects
 - Tanks and forbearance
 - Focusing on Browns Creek and Tule Creeks
 - Working to purchase and install tank arrays for land owners
 - Fill the tanks with water in the spring, and landowner uses that water throughout the dry season when instream levels are low and taking water from streams is problematic for aquatic organisms
 - Completed another two project this fall, and working on another this spring
 - Looking to expand into other watersheds for this tanks and forbearance program
 - Staff member update: Nathan McCanne is leaving the WRTC for another opportunity
 - Thank you, Nathan for all of your help with the Trinity River Watershed Council and all of the great work you have done in the basin!

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net

Trinity River Watershed Council – March 12th, 2024

- 5 Counties Salmonid Conservation Program/ Northwest California Resource Conservation & Development Council: not present
- Trinity County Fish and Game Commission:
 - Currently, only two members are on the Trinity County Fish and Game Commission. If anyone is inspired to join this group, they are encouraged to apply and become commissioners.
 - The advisory committee has a couple thousand dollars to hand out for certain projects. They have provided this funding to a local fishing derby in the past. With a lack of representation within the Fish & Game Commission, funding that can be provided towards outreach events such as the fishing derby is lost to the community.
 - Most positions are vacant: Recreation, Fisheries, Habitat Restoration, Wildlife, and Public Member at Large

Comments in the chat:

- Nathan McCanne (WRTC): Here is the website for the Fish and Game Advisory Commission:
<https://www.trinitycounty.org/Fish-and-Game-Advisory-Commission>
- Nathan McCanne (WRTC): Richard Cole's email: richcole10@yahoo.com
- Nathan McCanne (WRTC): Liam Gogan's email: lgogan@trinitycounty.org

- Trinity County Agriculture Alliance (TCAA)
 - Supporting a strategic planning for 2024/2025
 - With winterization, helping to support people with ensuring they are doing proper winterization and that they do not have runoff on roads
 - Helping people implement best practices in the best ways for their site
 - Many people going through LSAA renewals this year
 - Helping people with increasing water storage as forbearance is required for cannabis farmers
 - Helping small farmers of all kinds with diversification, sustainable practices, increasing of water storage, and any winterization issues that may arise
 - Ensuring that sediment is not running off and that all soil in disturbed areas is properly winterized
 - Looking at the next season and trying to make sure that people know how to implement compliance and best practices in a way that is feasible for their site
 - Roads being washed out by the river in Hyampom:
 - The South Fork is eddying out onto a road that is beyond the county's jurisdiction of a road and on private land, but it is difficult for private landowners to find emergency funding in situations like this. Trying to figure out how to solve this issue.
 - Staff Update: Welcome to Adrien Keys as the new Policy Chair at TCAA!
- Flowra
 - 319 Water Board Grant to do assessments on Post Mountain roads
 - Grant is anticipated to be signed by the next TRWC meeting
 - Roads and water issues discussions
 - Personal concern with individual water users without registered water rights or Lake and Streambed Alteration Agreements (LSAA)

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrwd.net

Trinity River Watershed Council – March 12th, 2024

- Unregistered water users are not considered as part of cumulative effects
- Impact overall water available
- Impacts individuals who want to register their water rights and their LSAs
 - Response: CDFW staff member reminds that LSAs are not necessarily needed carte blanche for every single diversion. If projects substantially obstruct or diverts or has a significant adverse impact on the water resource, a LSAA would be warranted. People are not absolutely out of compliance if they do not have a LSAA. The exception may be for cannabis because of the requirements under the Cannabis Cultivation Policy. Requirements of water rights not well known by members of the public. Targeted outreach efforts could be made in known locations where people have large diversions.
 - Additional comment from WRTC staff member: From our experience dealing with water rights– agricultural, private, riparian, and appropriative– outreach and education is imperative. It is the landowner’s desire to be on the government record. The government would love to level the playing field across the board.
 - Comment from Yurok Tribal Fisheries staff member: The Fish & Game Commission could benefit from not dealing with water rights issues.

Comments in the chat:

- Trinity County RCD: chrisl@theflowraplatform.com

Next Meeting is June 11th, 2024 at 10am-12pm

Meeting Close: 11:39am

Questions?

Contact Annyssa Interrante at 530 623 6004 X 209 or email at ainterrante@tcrd.net



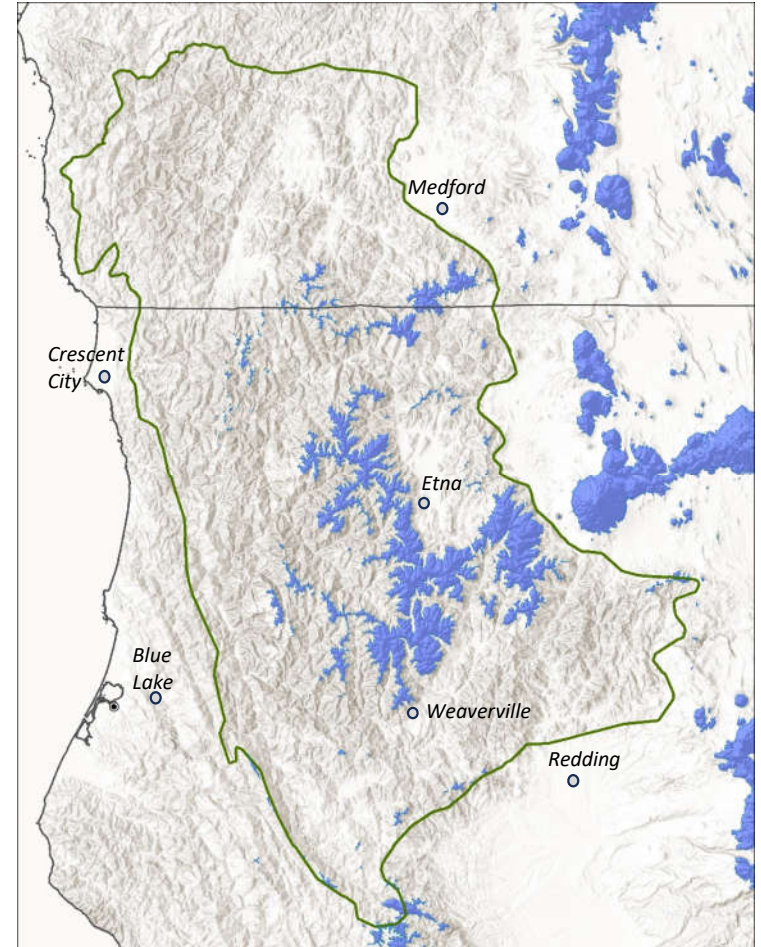
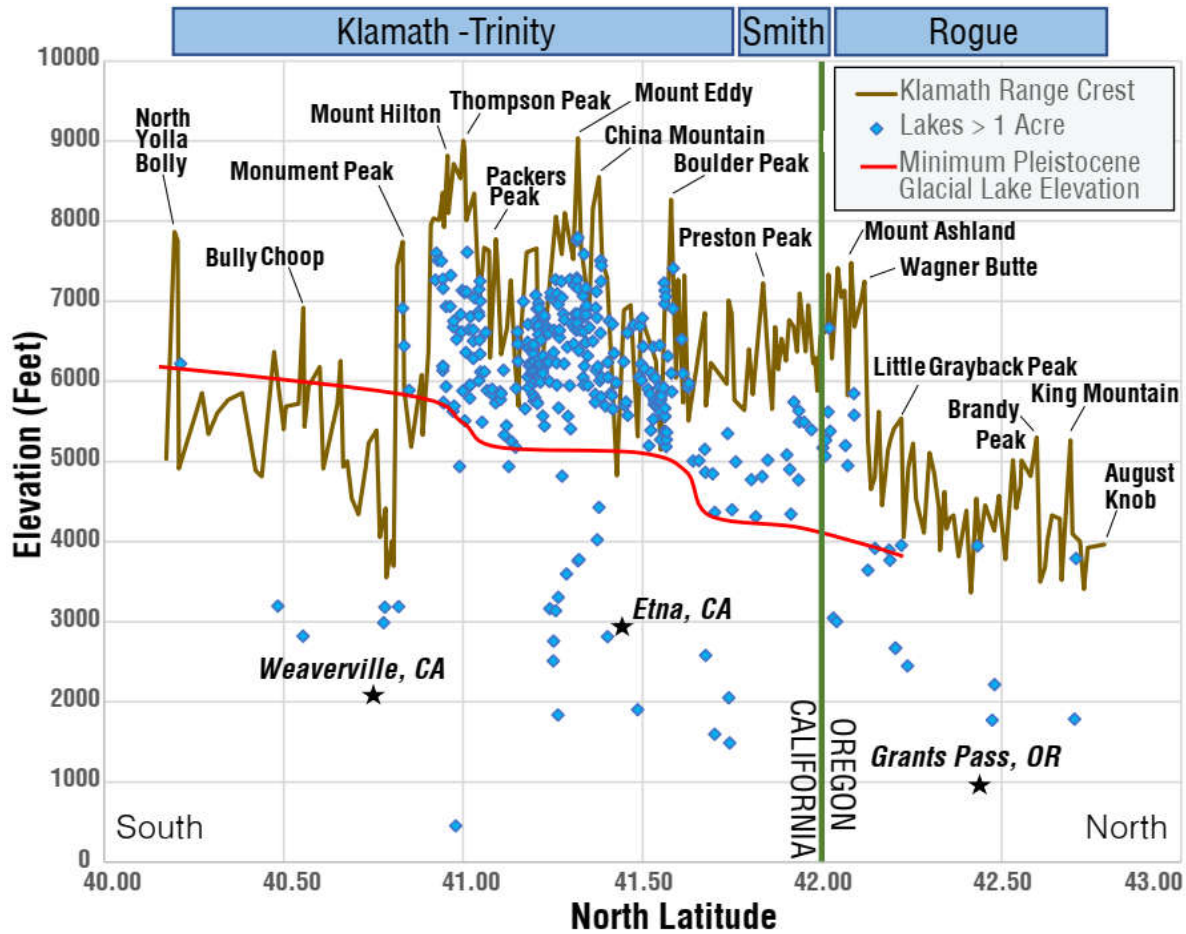
FROGS AND FISH

Reversing widespread legacy impacts of introduced sportfish on declining amphibians in glacial lake basins of the Klamath Mountains

Justin Garwood and Braden Herman
California Department of Fish and Wildlife
Northern Region—Fisheries



Pleistocene Glaciers Left Hundreds of Lake Basins Behind









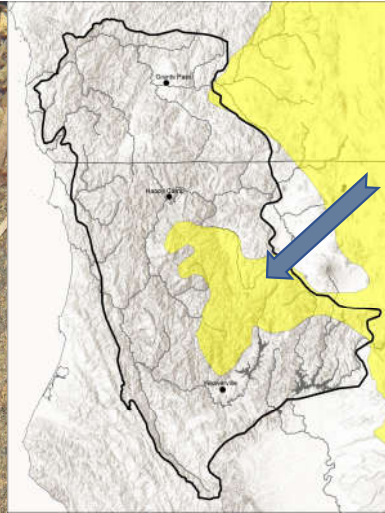




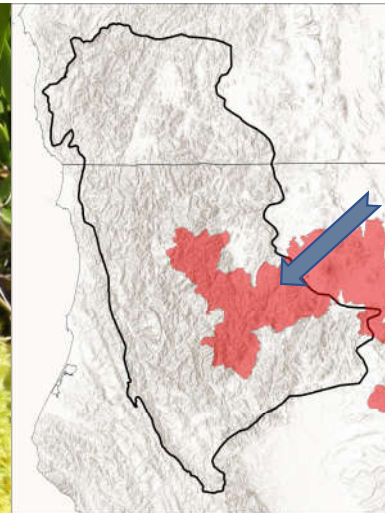


Klamath Mountains Post Ice Age Colonization

Long-toed Salamander
Ambystoma macrodactylum



Cascades Frog
Rana cascadae



Aquatic Invertebrates

Zooplankton

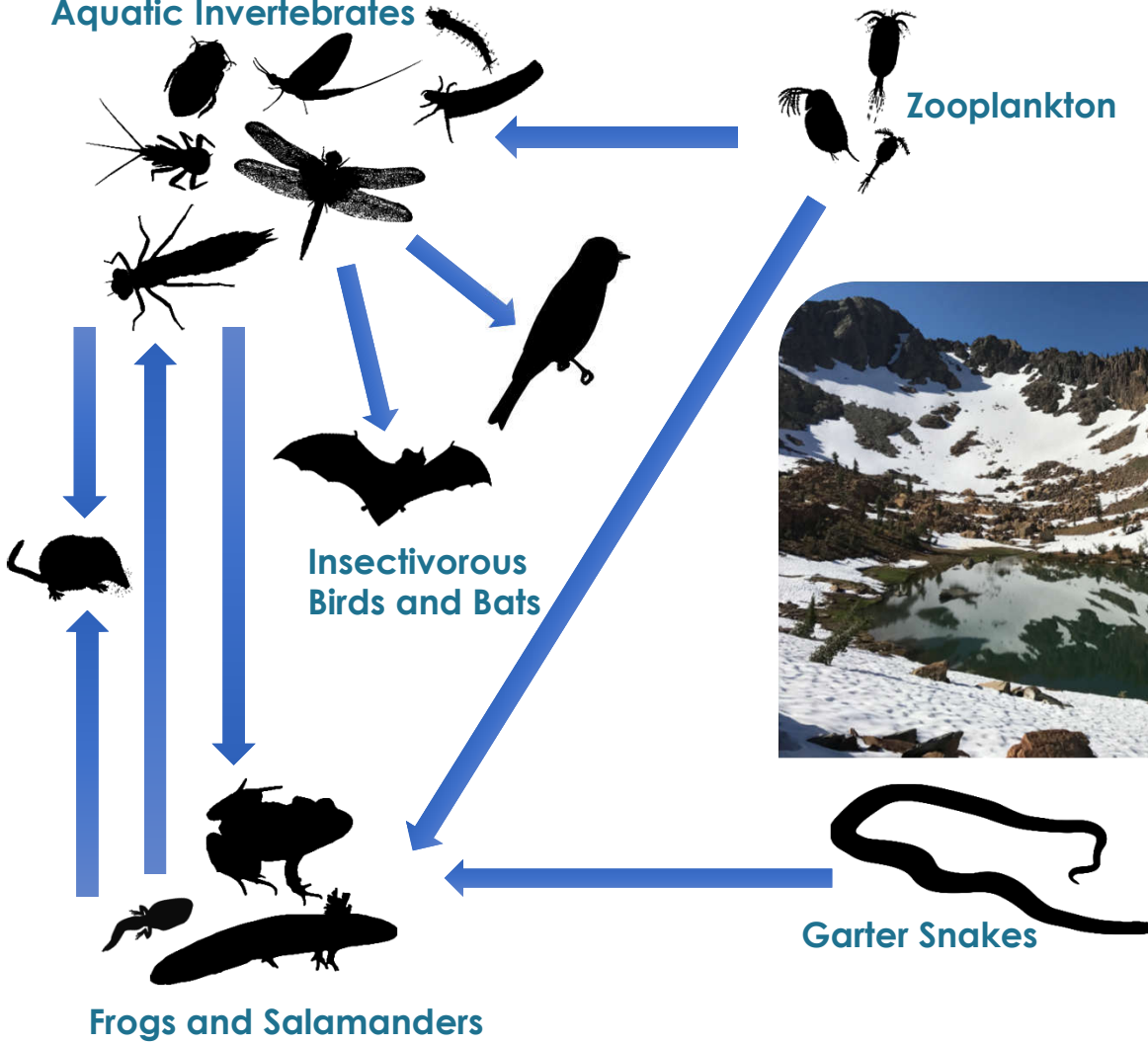
Insectivorous
Birds and Bats

Garter Snakes

Frogs and Salamanders

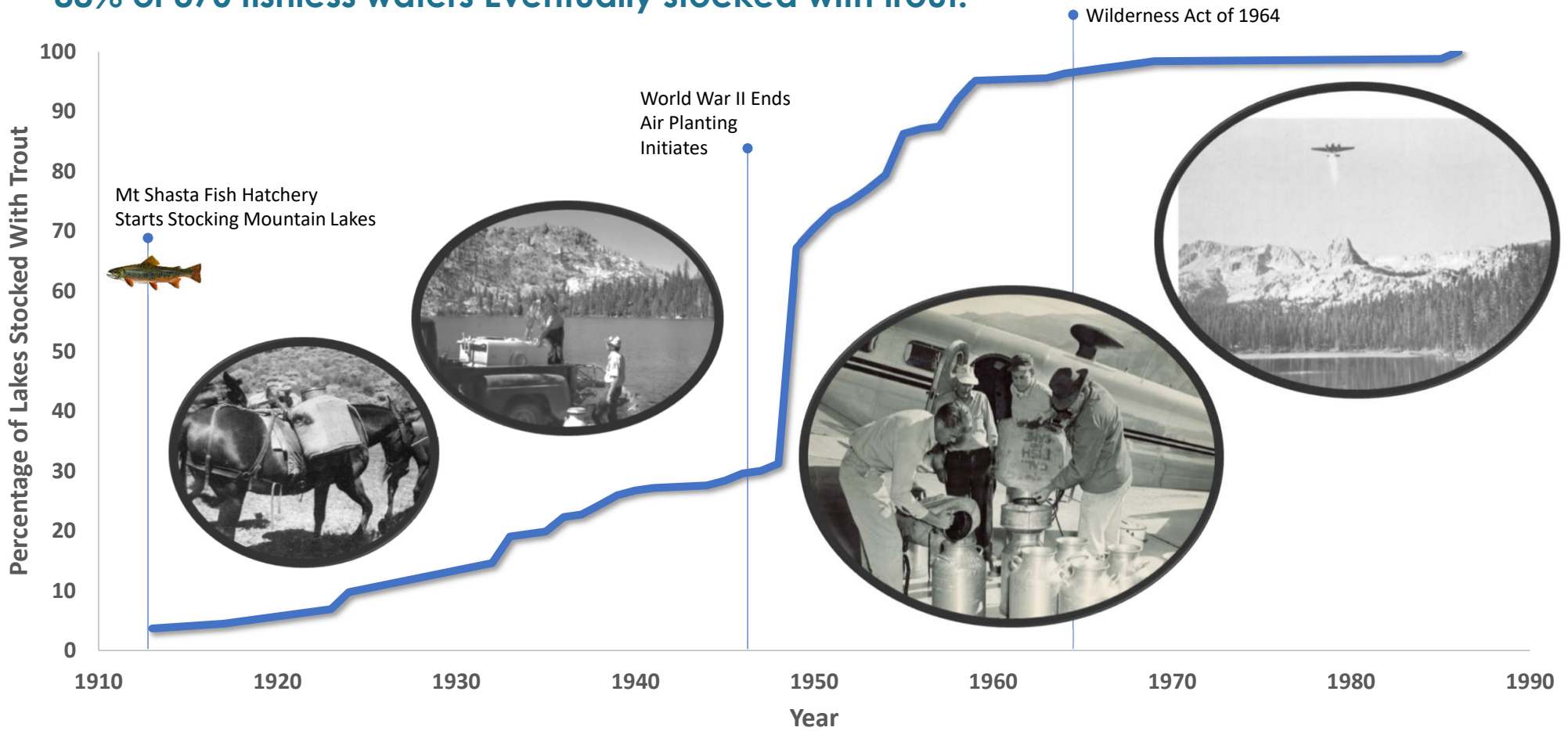


Klamath Mountain Lake Ecosystems



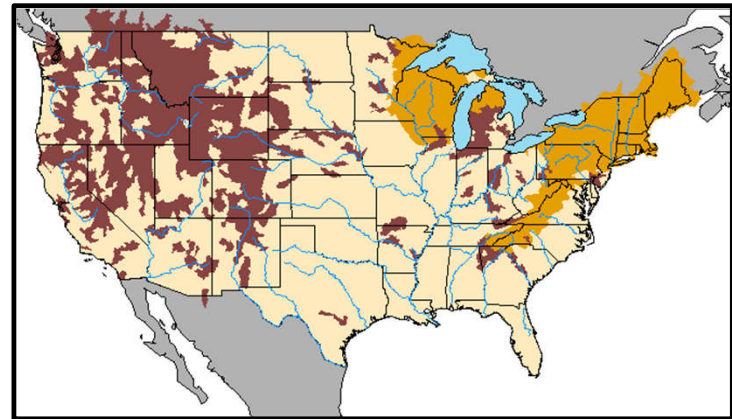
Stocking Chronology Across Lakes of the Klamath Mountains

88% of 370 fishless waters Eventually stocked with trout!



Brook Trout *Salvelinus fontinalis*

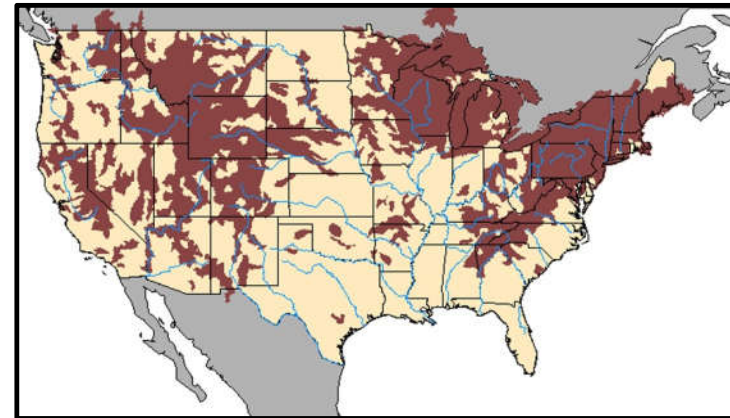
- Actually a char; native to eastern North America
- Adapted to **cold** streams and lakes
- **Fall** spawner in streams and **lakes**
- Feeds on invertebrates and **zooplankton**, also piscivorous
- Stocking Period: 1912-2016



Nathan McCanne

Brown Trout *(Salmo trutta)*

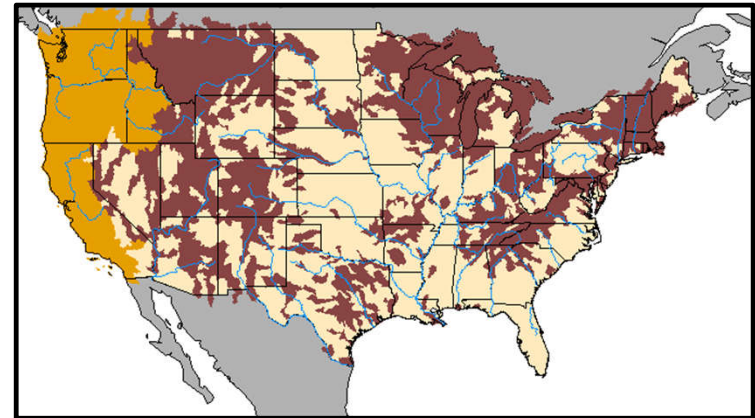
- Native to Europe/ north Africa
- Fall spawner: needs **streams** to spawn
- Formidable predator with a diverse diet, large adults are **piscivorous**
- Stocking Period: 1917-2007



Colin Harris

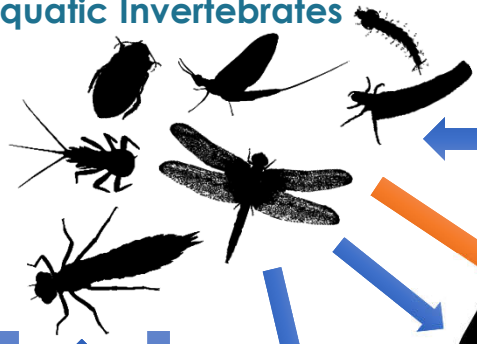
Rainbow Trout *(Oncorhynchus mykiss)*

- Regionally native
- Adapted to cool mid-elevation streams
- **Spring** spawner, needs **streams** to spawn
- Feeds on invertebrates
- Stocking Period: 1930-**Present**



Braden Herman

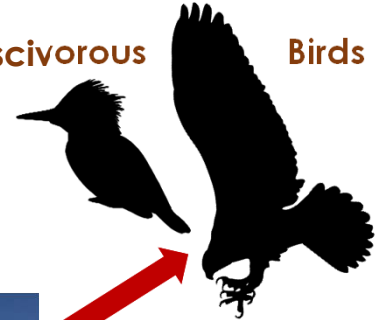
Aquatic Invertebrates



Zooplankton



Piscivorous Birds



Insectivorous Birds and Bats



Klamath Mountain Lake Ecosystems

Frogs and Salamanders



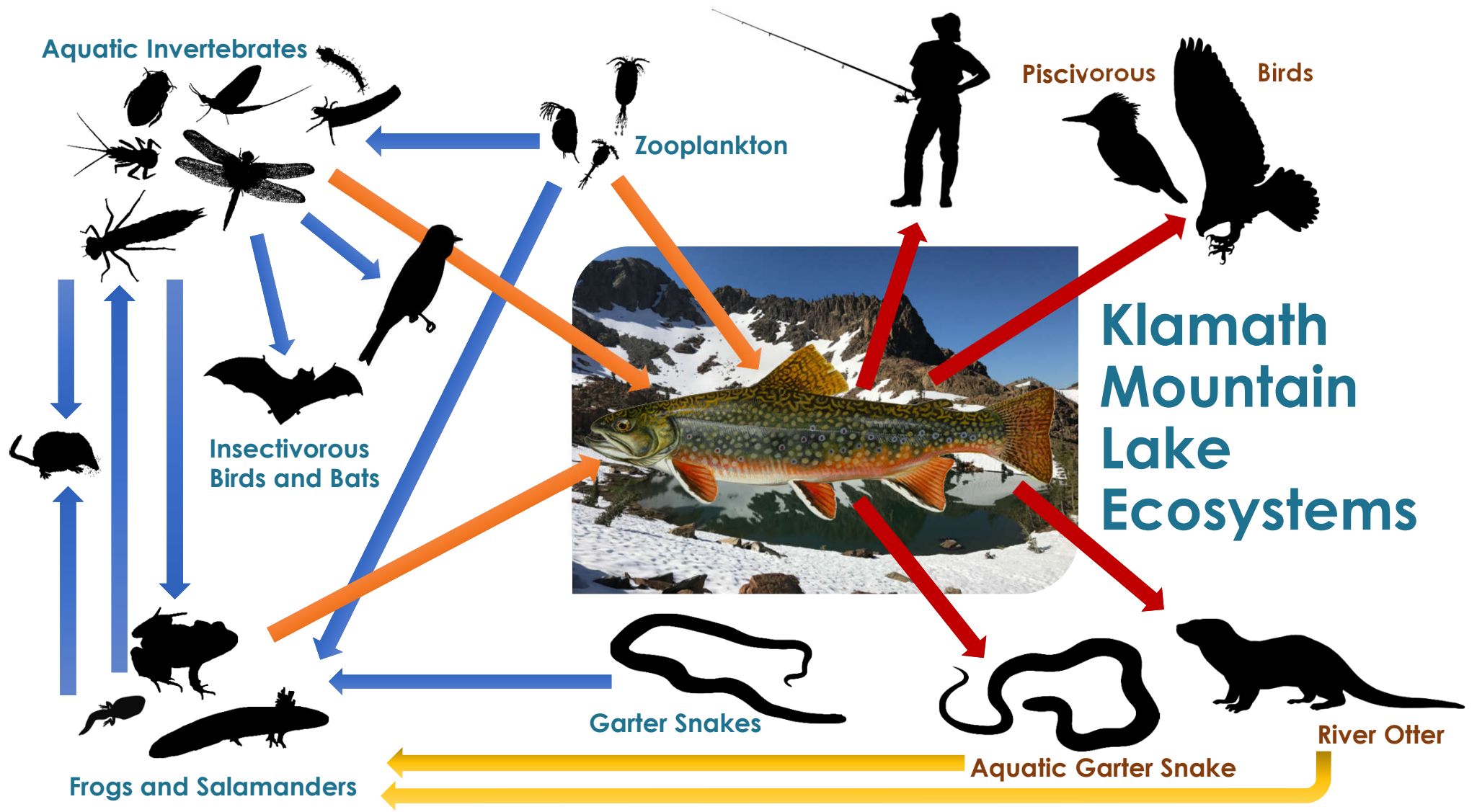
Garter Snakes



Aquatic Garter Snake



River Otter



Amphibians With Chemical Defenses

Rough-skinned Newt

(Taricha granulosa)



Western Toad

(Anaxyrus boreas)



Cascades Frog (*Rana cascadae*)



Life History

- High-elevation specialist
- Lake and pond breeder
- Long-lived

Status

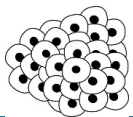
- California Species of Special Concern
- Petitioned for California ESA threatened status (2017)

Major Threats

- Invasive Fishes
- Habitat Loss/Alterations
- Disease

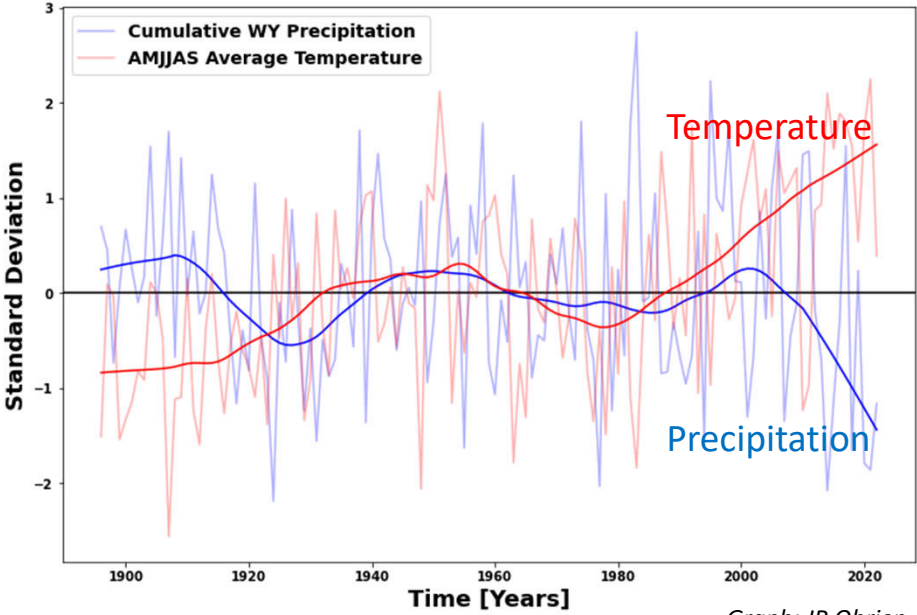
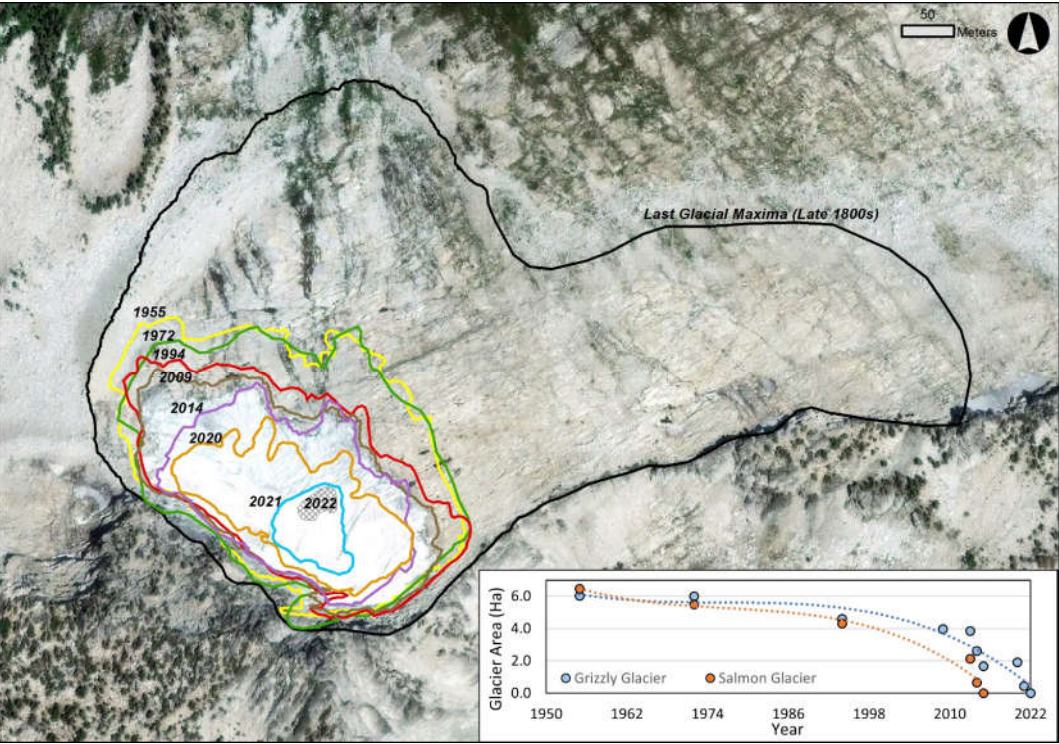


First Summer



Climate Change

Klamath Mountains Vital Signs



Graph: JP Obrien

Hydrology is Destany....

Wet Year



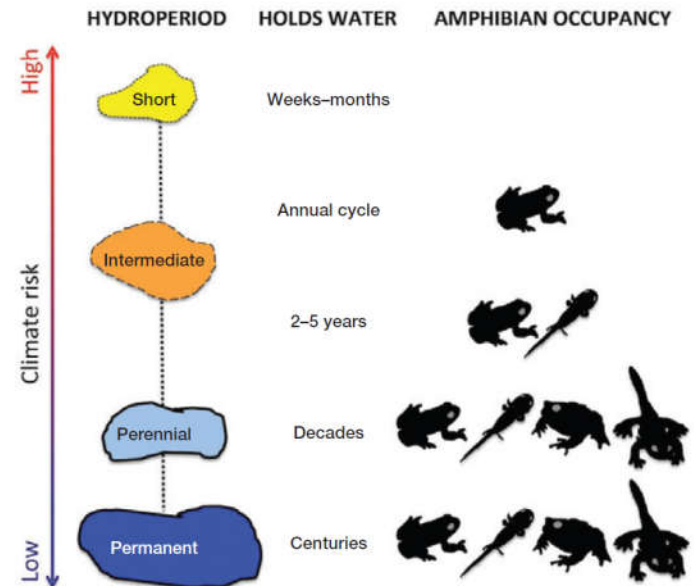
Dry Year



REVIEWS REVIEWS REVIEWS *Front Ecol Environ* 2014; 12(4): 232–240, doi:10.1890/130145

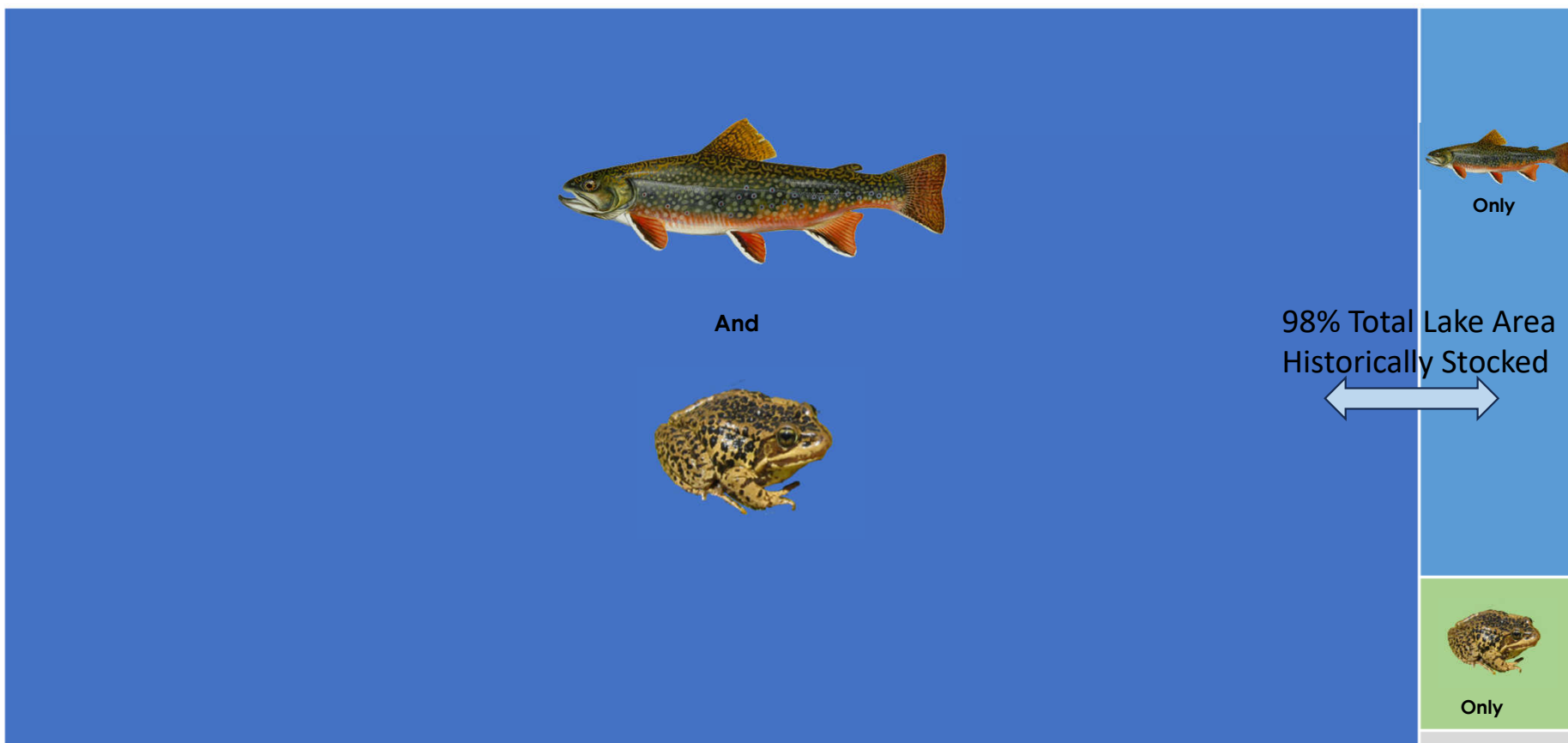
Amphibians in the climate vice: loss and restoration of resilience of montane wetland ecosystems in the western US

Maureen E Ryan^{1,2*}, Wendy J Palen², Michael J Adams³, and Regina M Rochefort⁴



Relative Surface Area of Klamath Mountain Lakes Based on **Historic** Cascades Frog and **Stocked** Nonnative Trout Distributions

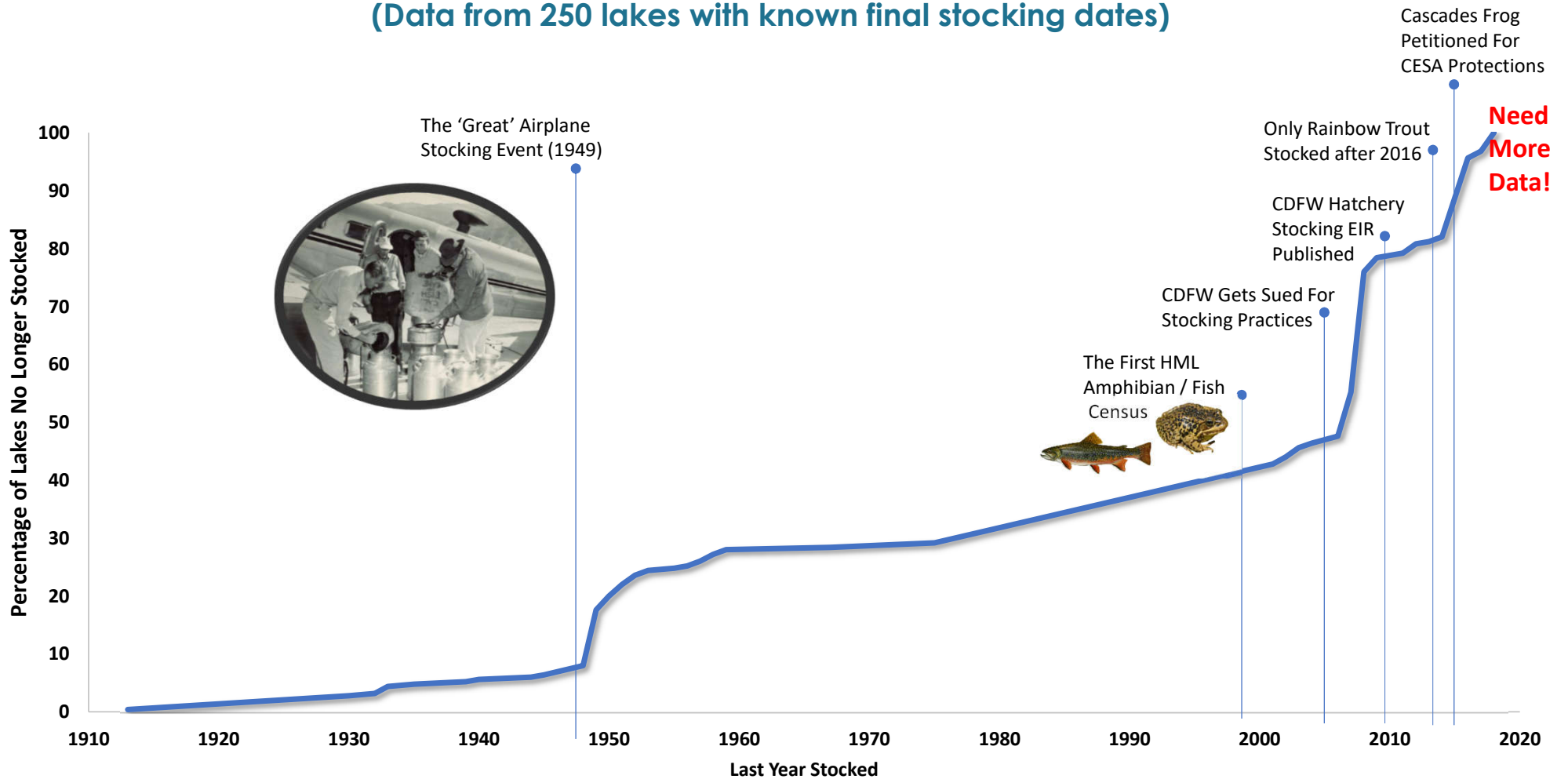
■ Stocked: Cascades Frog Present ■ Never Stocked: Cascades Frogs Present ■ Stocked: No Cascades Frogs ■ Never Stocked: No Cascades Frogs



Data Sources: CDFW, US Forest Service

Stocking Cessation Chronology Across Lakes of the Klamath Mountains

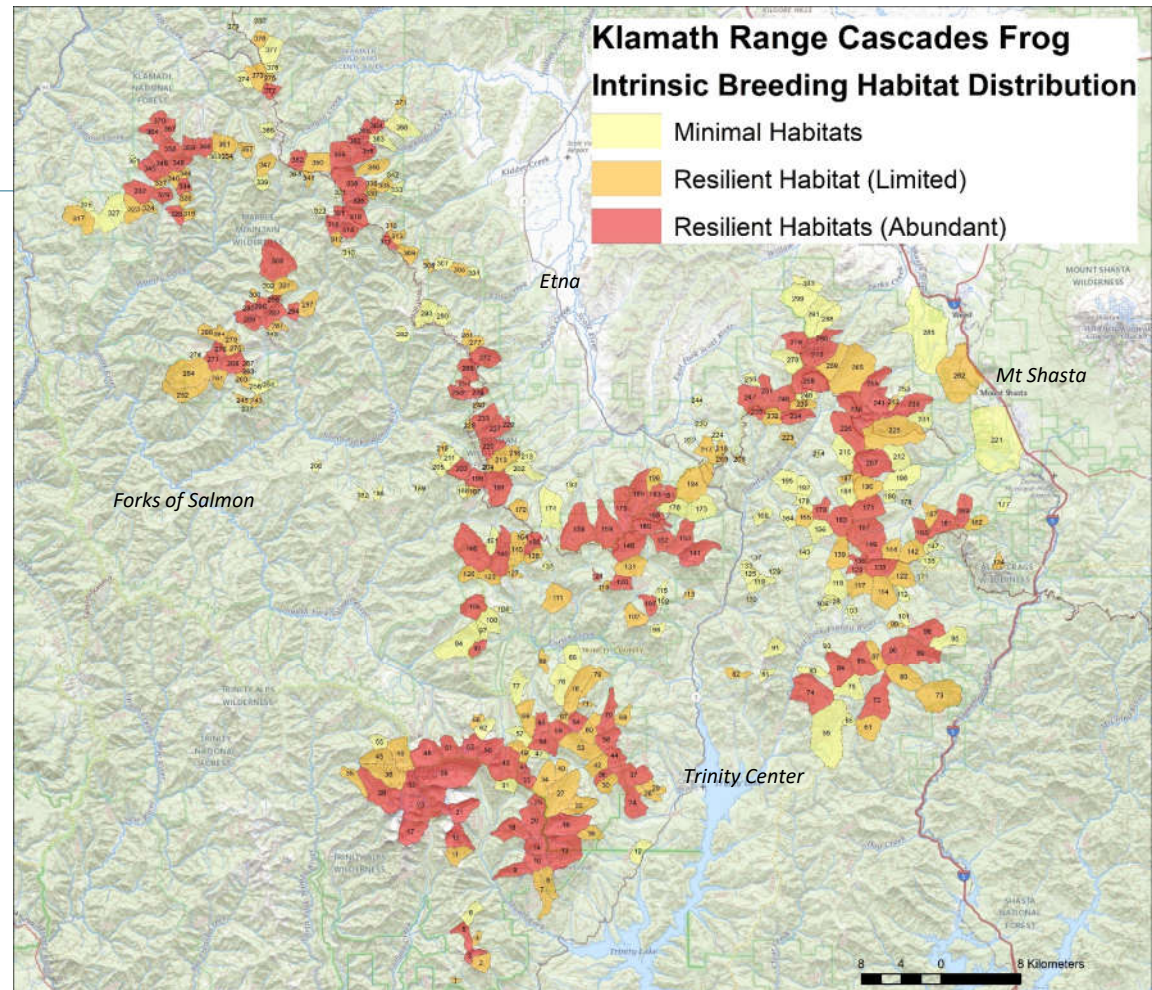
(Data from 250 lakes with known final stocking dates)



State Wildlife Grant 2021-2023

HML 2.0

- Survey for Cascades Frogs across their historic California Range.
- Survey for non-native fish across the historic range of Cascades Frogs.
- Compare survey results to previous robust effort over 20 years ago.
- Use current data to inform a new range-wide fisheries management strategy.



Survey Methods

Exact same methods as 20 years ago with a few new tricks....

Amphibians and Reptiles
Visual Encounter Surveys



Fishes
Gill Netting and Visual Encounter Surveys



35 (very) Tough Surveyors!

>2000 person-days in the Wilderness!

2022



*Missing: Amanda Nordstrom, Megan Berbererich, Skylr Lopez, Jeremy Johnson

2021



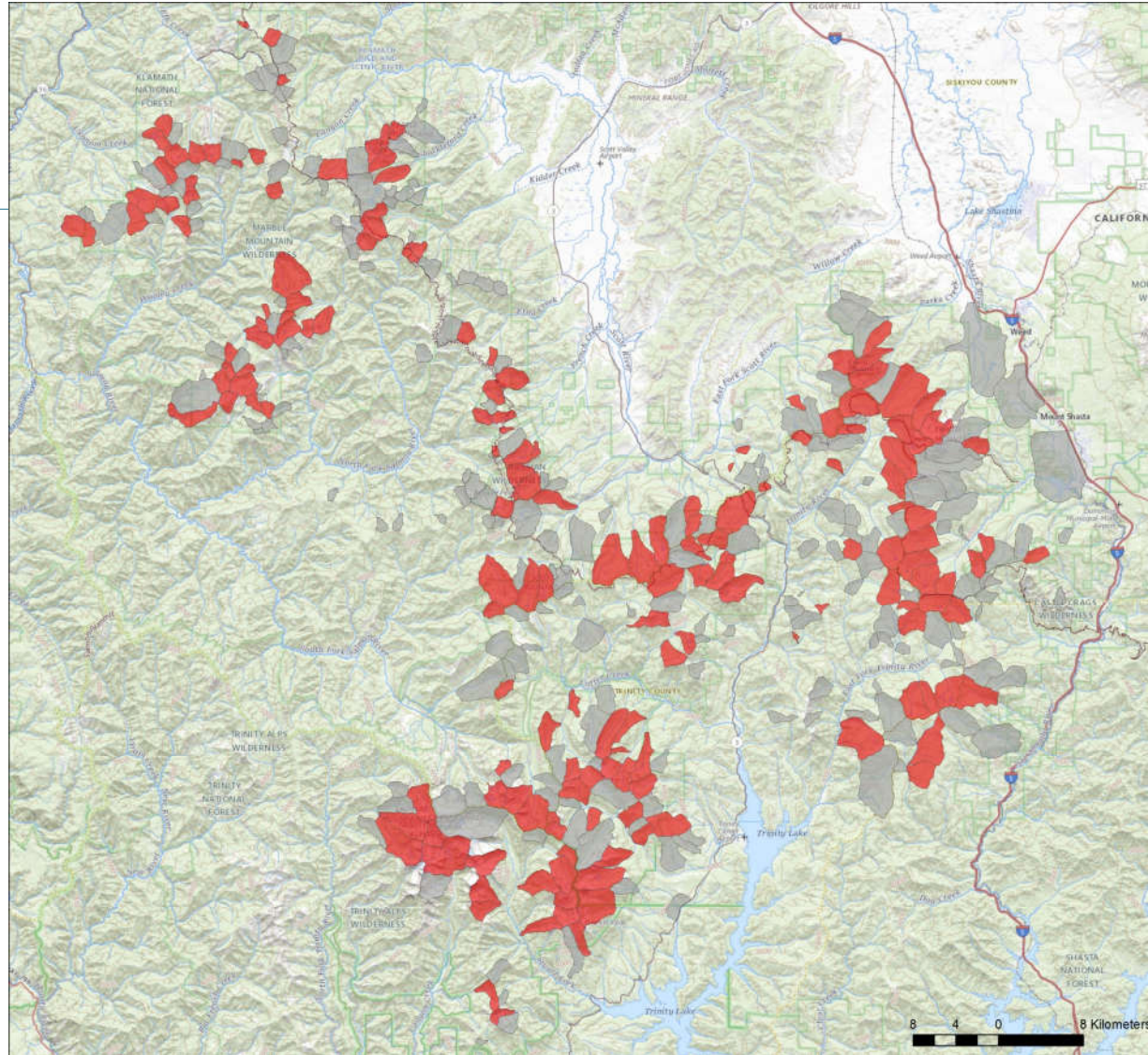
2023



*Missing: Jenna Hatfield, Mica Mills, Forest Peri

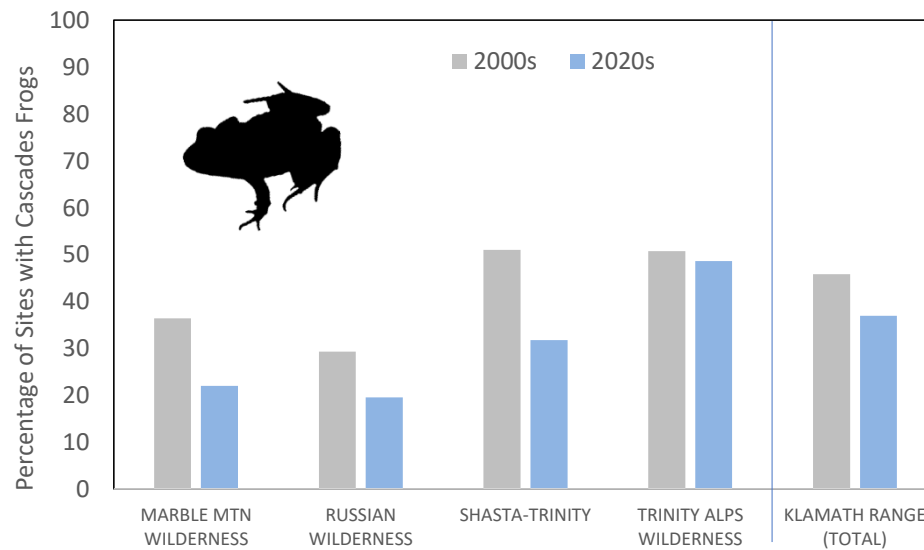
2021-2023 Survey Effort

- Surveyed ~1100 sites across 179 basins
- >500 identical sites surveyed between the 2 periods:
(1999-2002) and (2021-2023)
- 184 lakes gill net sampled for trout



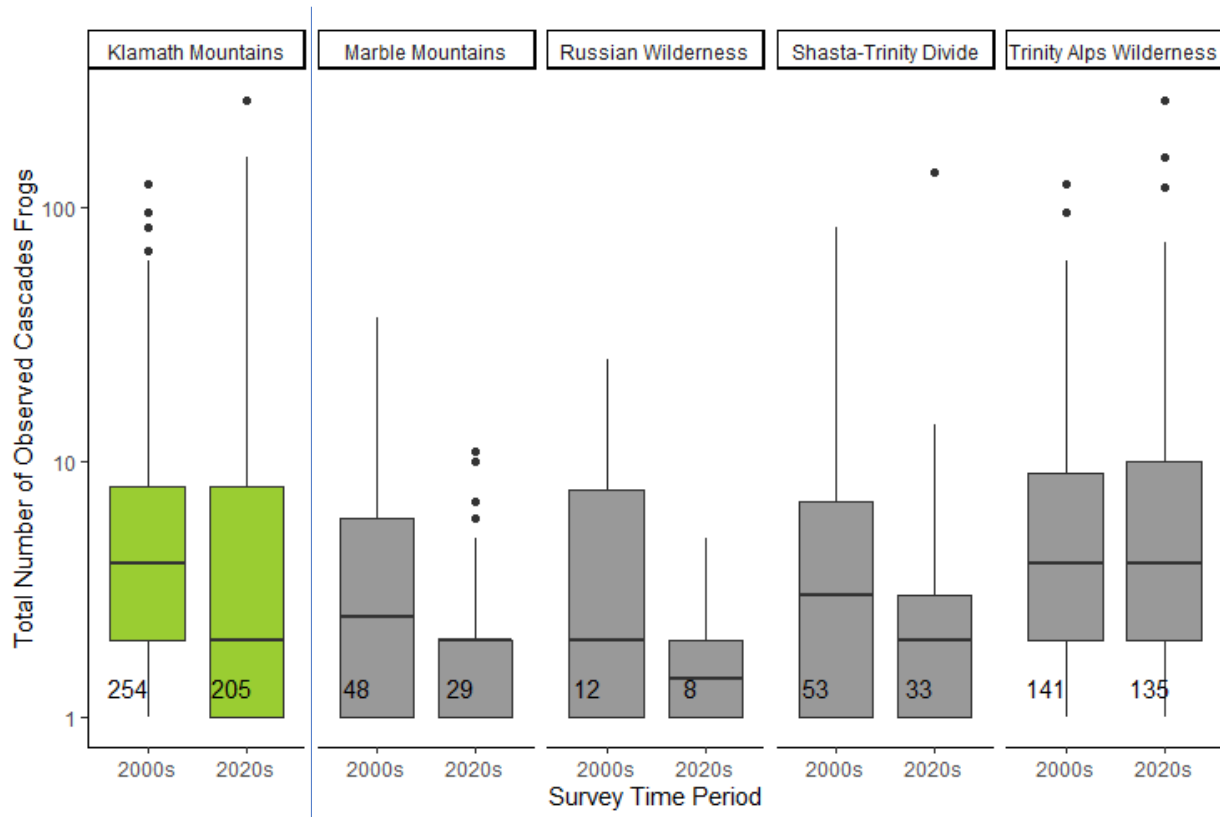
Cascades Frog Site Occupancy in the Klamath Range Across 555 Sites Separated By ~ 20 Years

Current survey found them at ~20% fewer sites relative to 20 years ago



Data Sources: CDFW, US Forest Service

Current Cascades Frog survey counts across 555 Klamath Mountain sites are ~ 50% lower than those observed ~20 years ago.



Data Sources: CDFW, US Forest Service

Fishery Status Within The Klamath Range

Stocking History

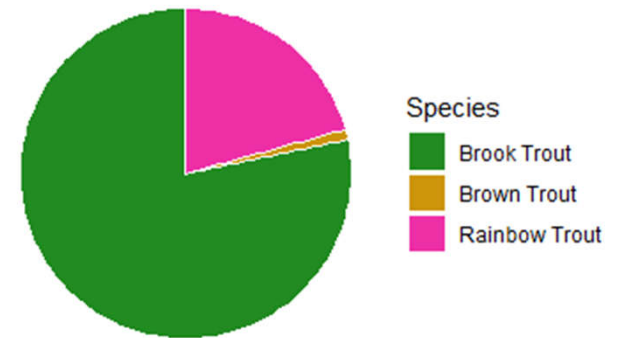
- 285 (88%) historically stocked.
- 97% large lakes historically stocked.

Current Trout Population Status

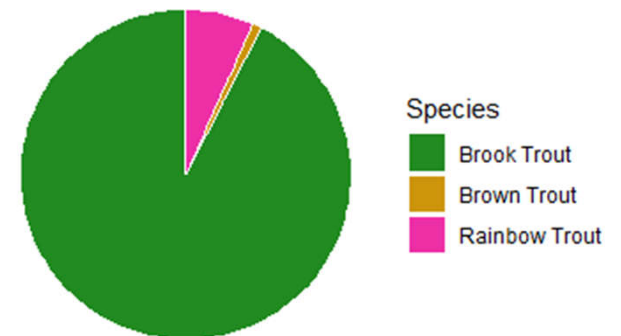
- Present in 218 (76%) of 285 historic stocked waters.
- Natural reproduction in at least 78% of waters.
- No longer present in 67 (24%) historically stocked waters.



Historic Composition



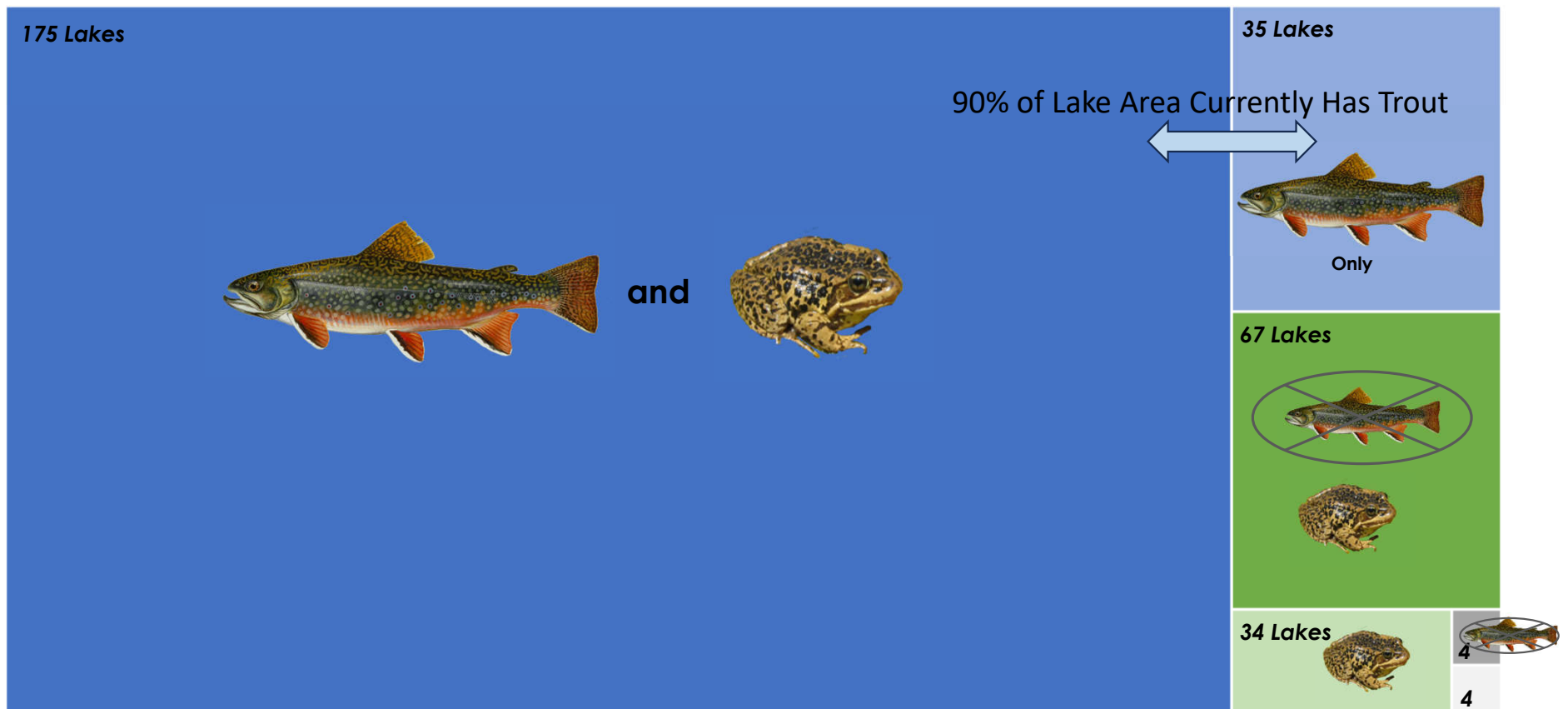
Current Composition



Data Sources: CDFW, US Forest Service

Relative Surface Area of Klamath Mountain Lakes Based on **Current** Nonnative Trout and **Current** Cascades Frog Distributions

- Stocked: Cascades Frog Present
- Stocked: No Cascades Frog
- Stocked Fish Extripated: Cascades Frog Present
- Stocked: Cascades Frog Absent
- Never Stocked: Cascades Frog Present
- Never Stocked: Cascades Frog Absent



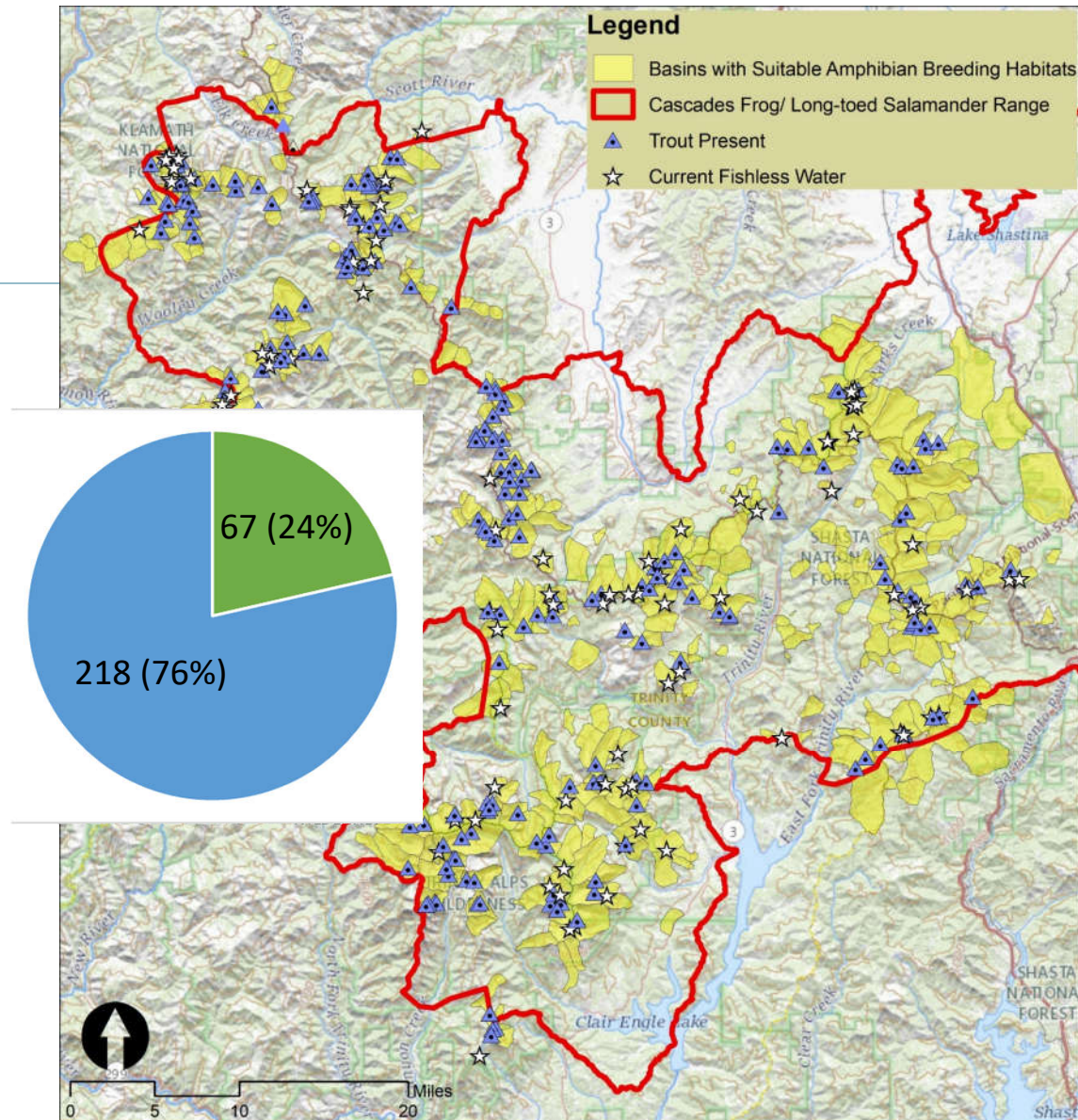
Data Sources: CDFW, US Forest Service



The Mission of the Department of Fish and Wildlife is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

Current Trout Distributions

- 323 waters in the Cascades Frog range
- 285 historically stocked with trout
- 218 still contain trout (24% went fishless naturally or through previous restoration)



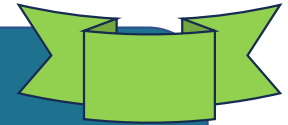
Management Options

1) Passive
Maintain Healthy
Naturalized Trout
Populations

2) Active
Resume Trout
Stocking in Select
Lakes

3) Passive
Maintain Currently
Fishless Waters

4) Active
Remove Trout at
Critical Climate-
Resilient Locations



Considerations for Managed Fisheries in High Lakes

What is best for the fish?

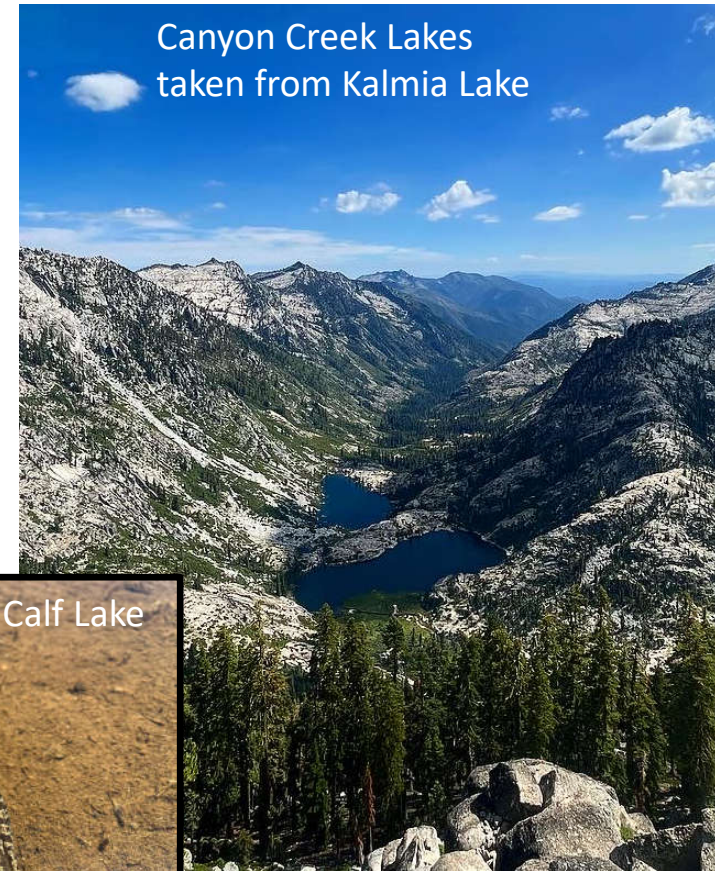
- Fish health
- Fish persistence
- Natural vs stocked populations

What is best for the angler?

- Popularity
- Hiking distance
- Multiple species

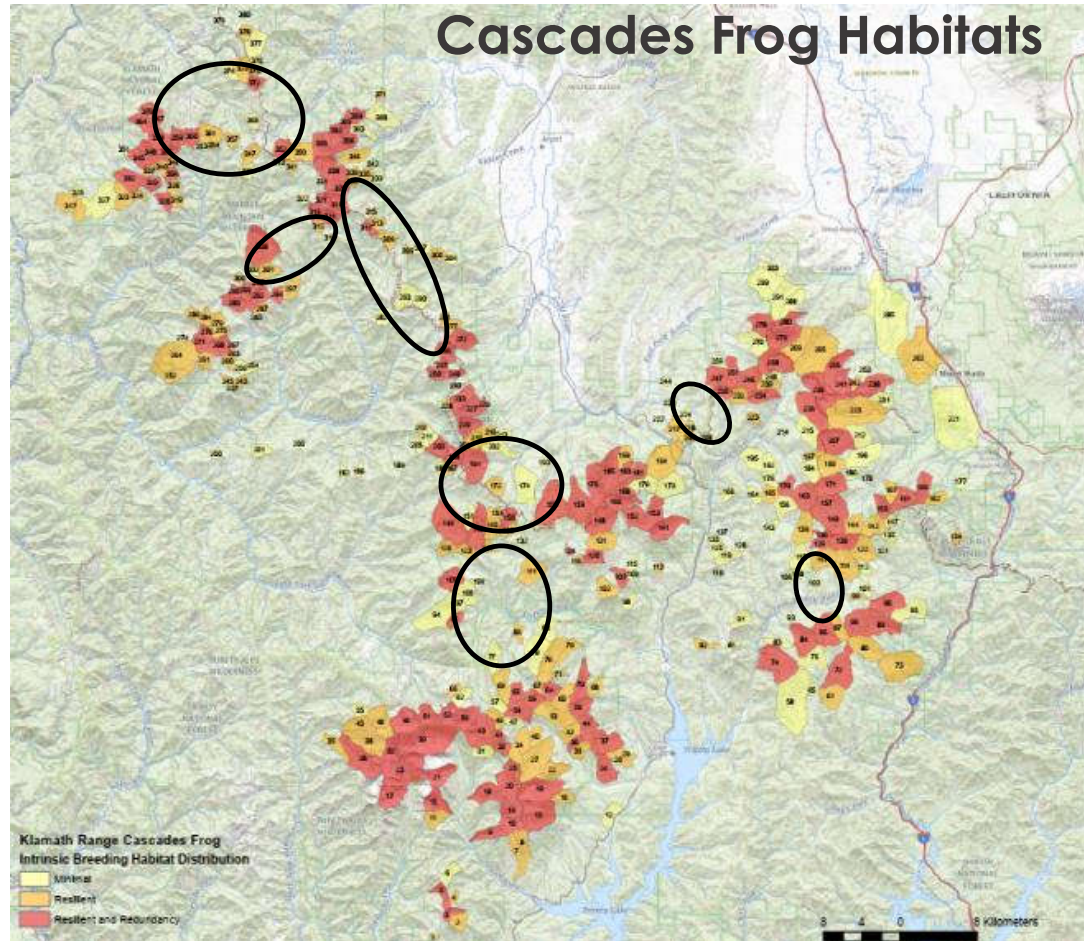
What is best for the amphibians?

- Breeding habitats
- Adjacent permanent waterbodies
- Dispersal corridors
 - Fish Removal in key habitats

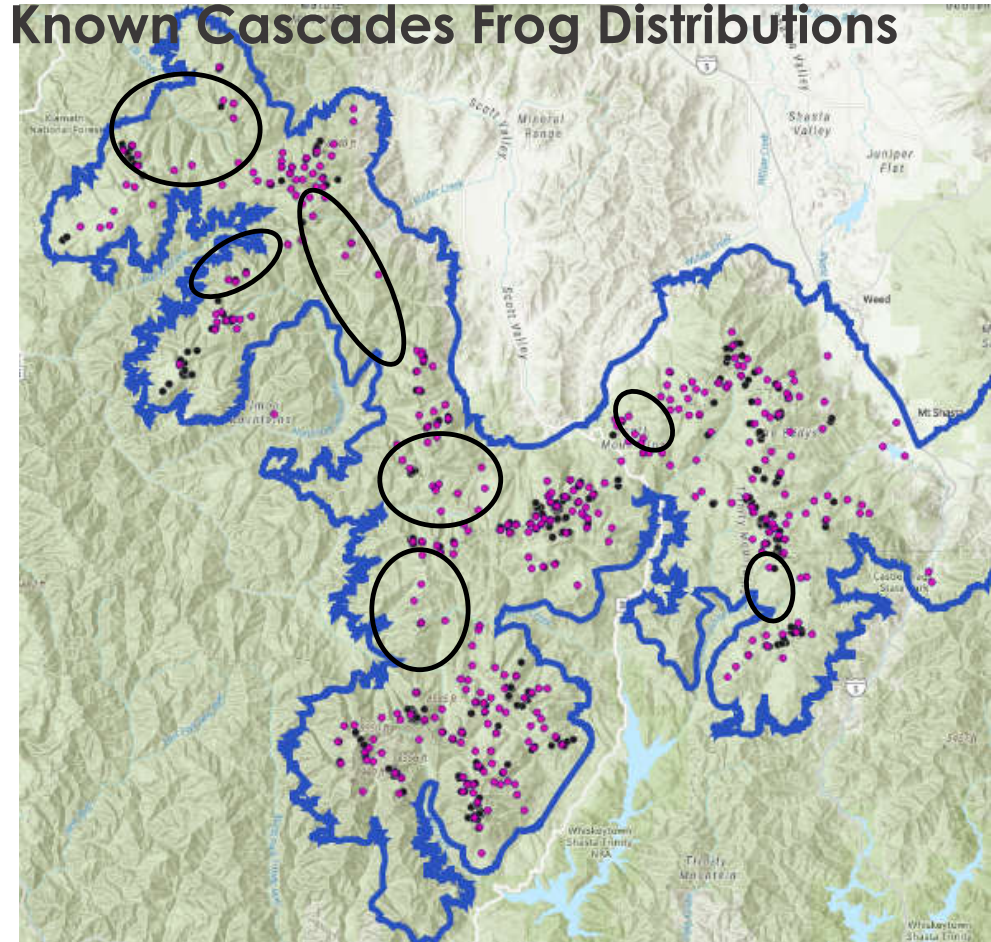


Cascades Frog Metapopulation Structure

Cascades Frog Habitats



Known Cascades Frog Distributions



Initial Lake Screening For Restorations

- Waters in Cascades Frog Range= 323
↓
- Current Trout Presence= 217
↓
- Feasibility (<3 ha, <10 m deep)= 124
↓
- MCDA analysis on 124 lakes
↓
- List of 25 potential restorations



Overlooking Grizzly Lake

Multi Criteria Decision Analysis (MCDA)

- Used in wildlife resources for balancing finite resource use by multiple conflicting interest groups

Steps:

- Intrinsic Potential for Interest group
- Use a weighted scoring to determine importance of lake for each interest group.
- Calculate restoration and stocking scores

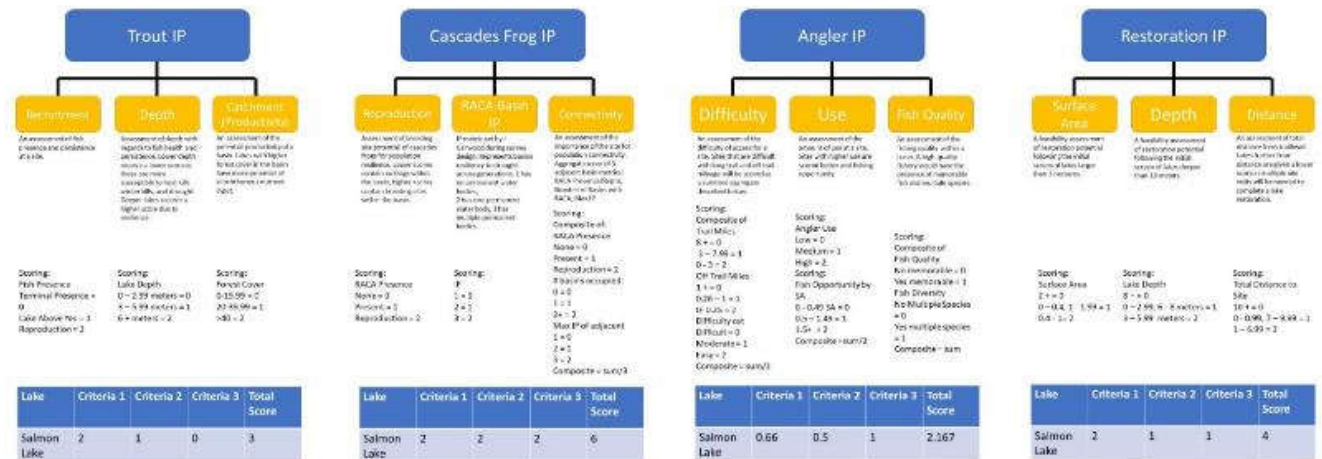


Table assessing overall importance of a lake for trout

Lake	Trout	Frog	Angler	Resto Potential	Total
Weights	5	1	3	1	
Salmon Lake	5*3 = 15	1*6 = 6	3*2.167 = 6.5	1*4 = 4	31.5

Table assessing overall importance of a lake for Cascades Frogs

Lake	Fish	Frog	Angler	Resto Potential	Total
Weights	1	5	1	3	
Salmon Lake	1*3 = 3	5*6 = 30	1*1.66 = 1.66	3*4 = 12	47.167

Table assessing overall importance of a lake for angler opportunities

Lake	Trout	Frog	Angler	Resto Potential	Total
Weights	3	1	5	1	
Salmon Lake	3*3 = 9	1*6 = 6	5*1.66 = 8.3	1*4 = 4	29.83

$$\text{Site Resto Score} = \frac{(\text{Frog} * 2)}{\text{Trout} + (\text{Frog} * 2) + \text{Angler}}$$

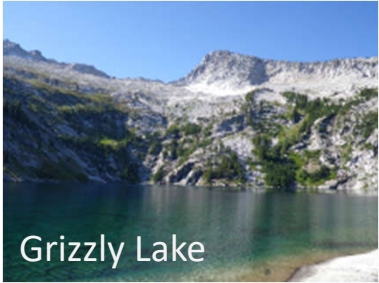
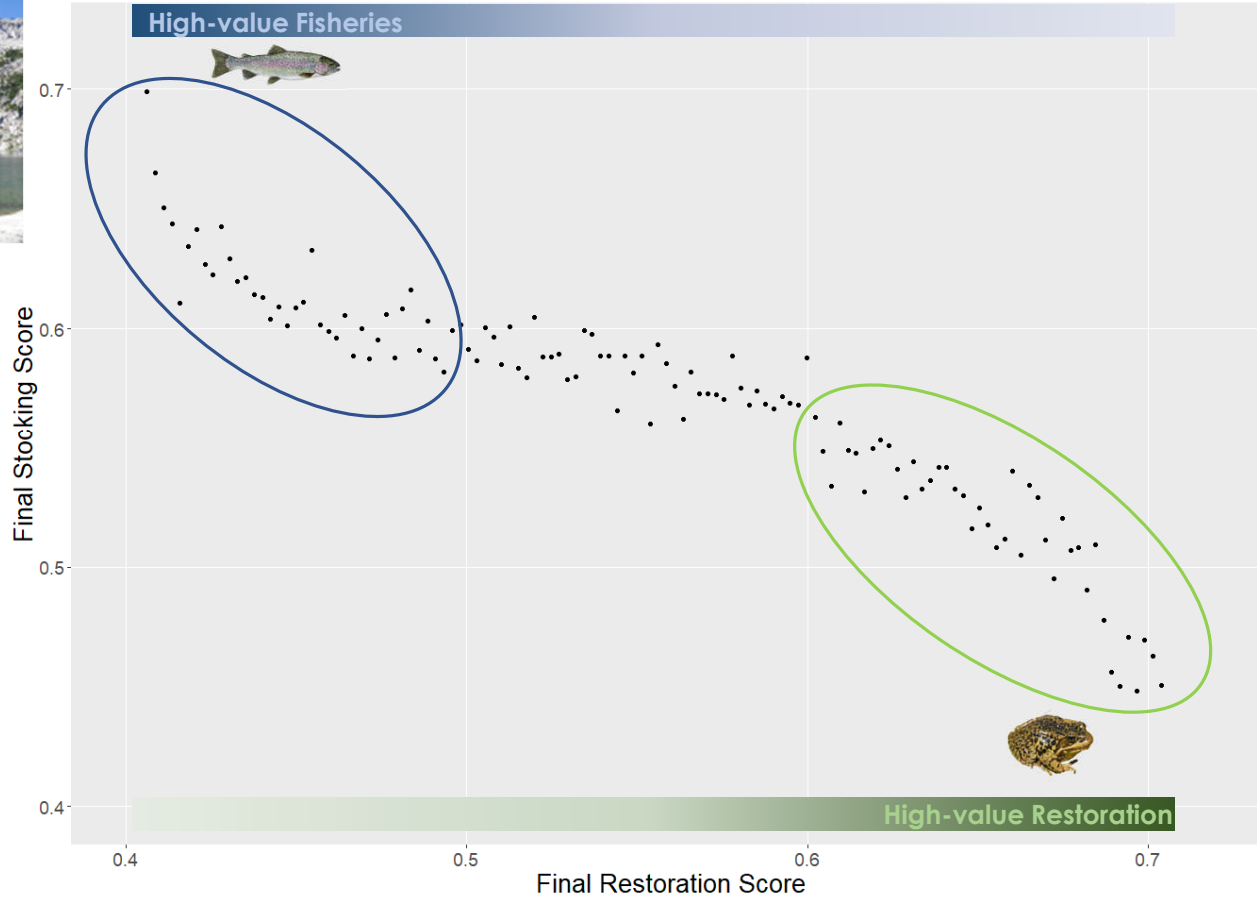
$$\text{Salmon Lake} = \frac{(46.66 * 2)}{30 + (46.66 * 2) + 27.33} = 0.61$$

$$\text{Site Stocking Score} = \frac{(\text{Trout} * 2) + (\text{Angler} * 0.5)}{\text{Frogs} + (\text{Trout} * 2) + \text{Angler}}$$

$$\text{Salmon Lake} = \frac{(30 * 2) + (27.33 * 0.5)}{46.66 + (30 * 2) + 27.33} = 0.60$$

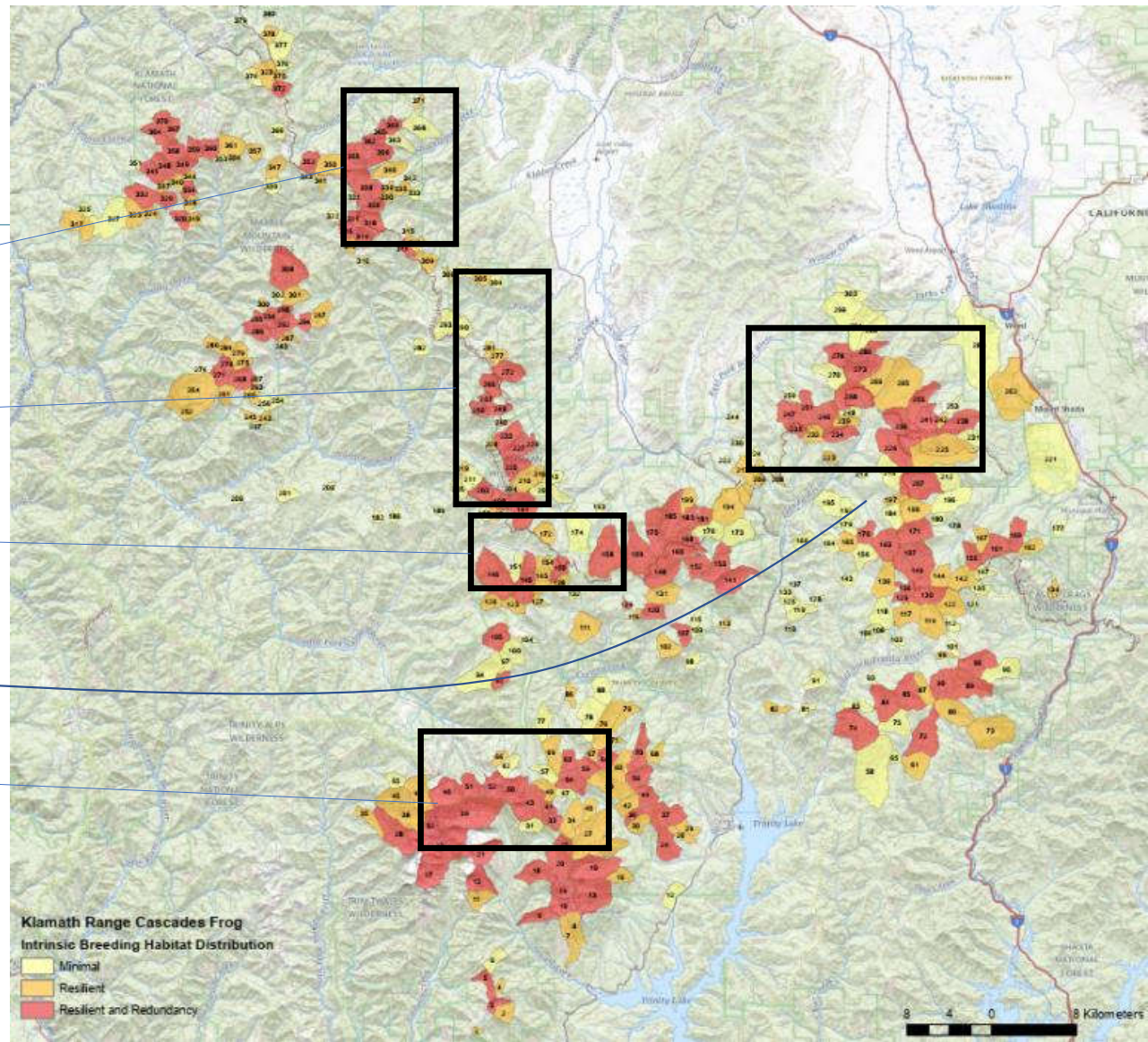
Final MCDA Results

Relationship Between Weighted Stocking and Restoration Scores for 124 Candidate Lakes



Restoration: Regions of Focus

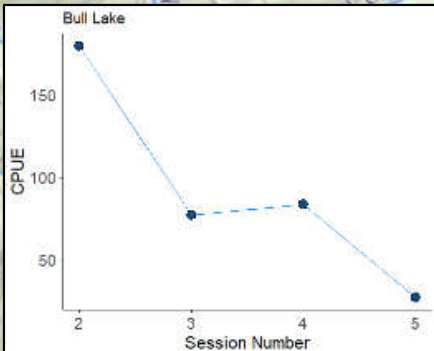
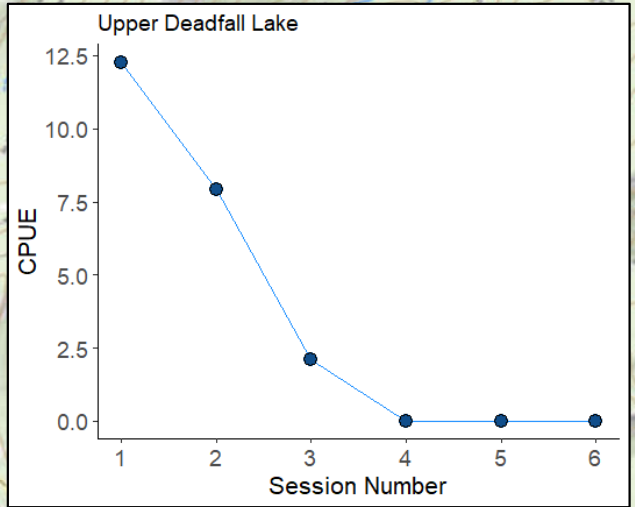
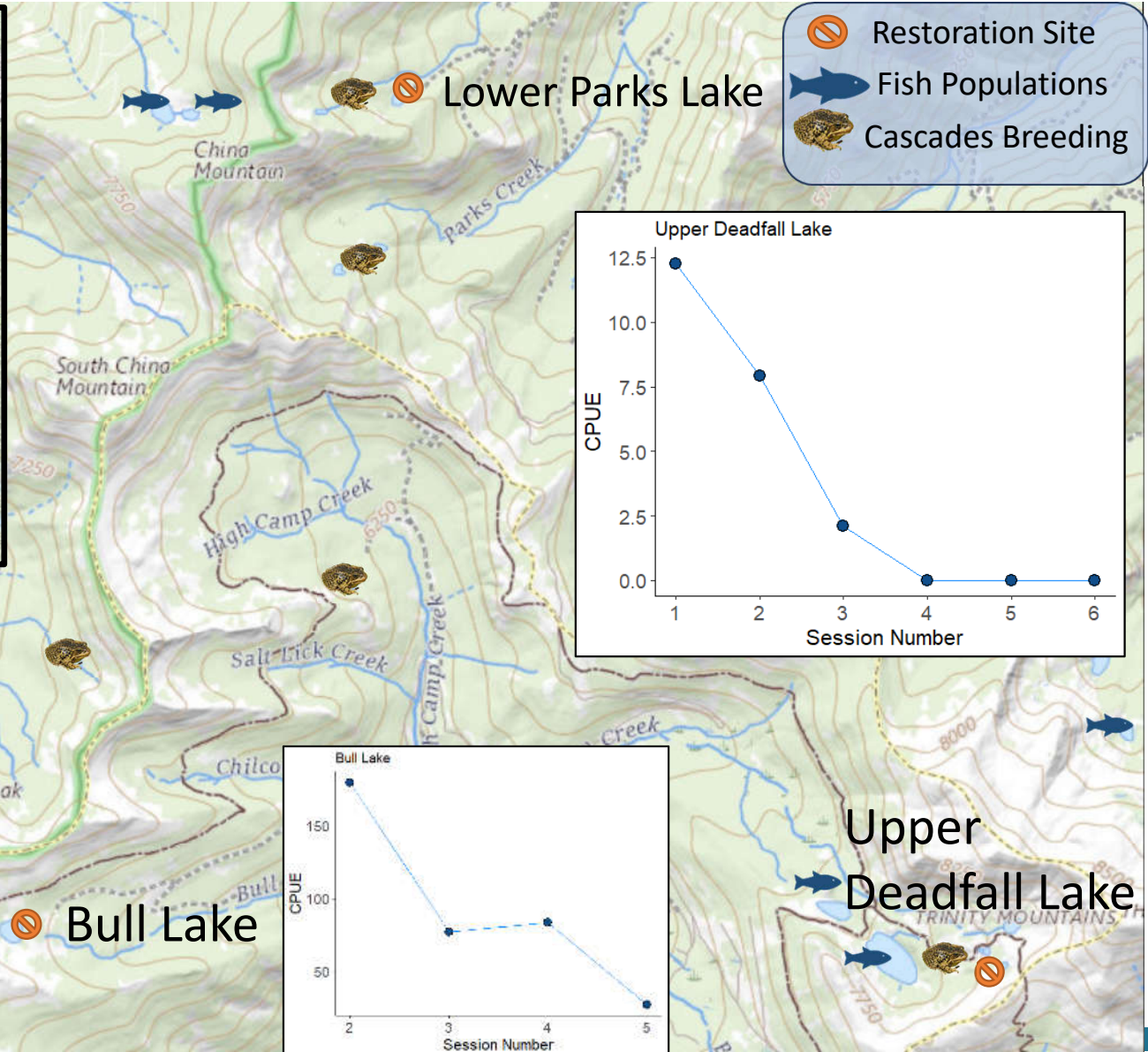
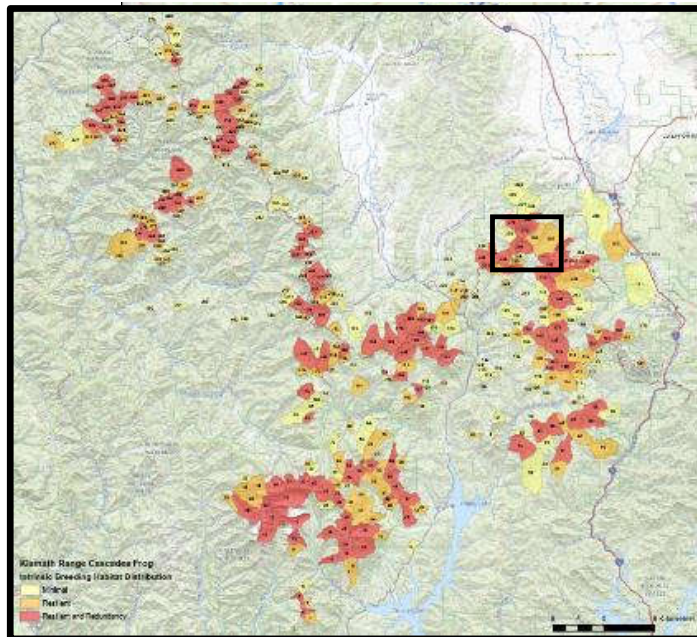
- NE Marble Mountains (2 sites)
- Russian Wilderness (1 Site)
- Northern Trinity Rim (2 sites)
- Scott-Eddy Mountains (3 sites)
- Trinity Alps (1 site)



Scott-Eddy Shasta-Trinity Mountains

- Upper Deadfall Lake (2023)
- Rock Fence Lake
- Timber Lake
- Scott Lake
- Bull Lake (2023)
- Lower Parks Creek Lake (2023)



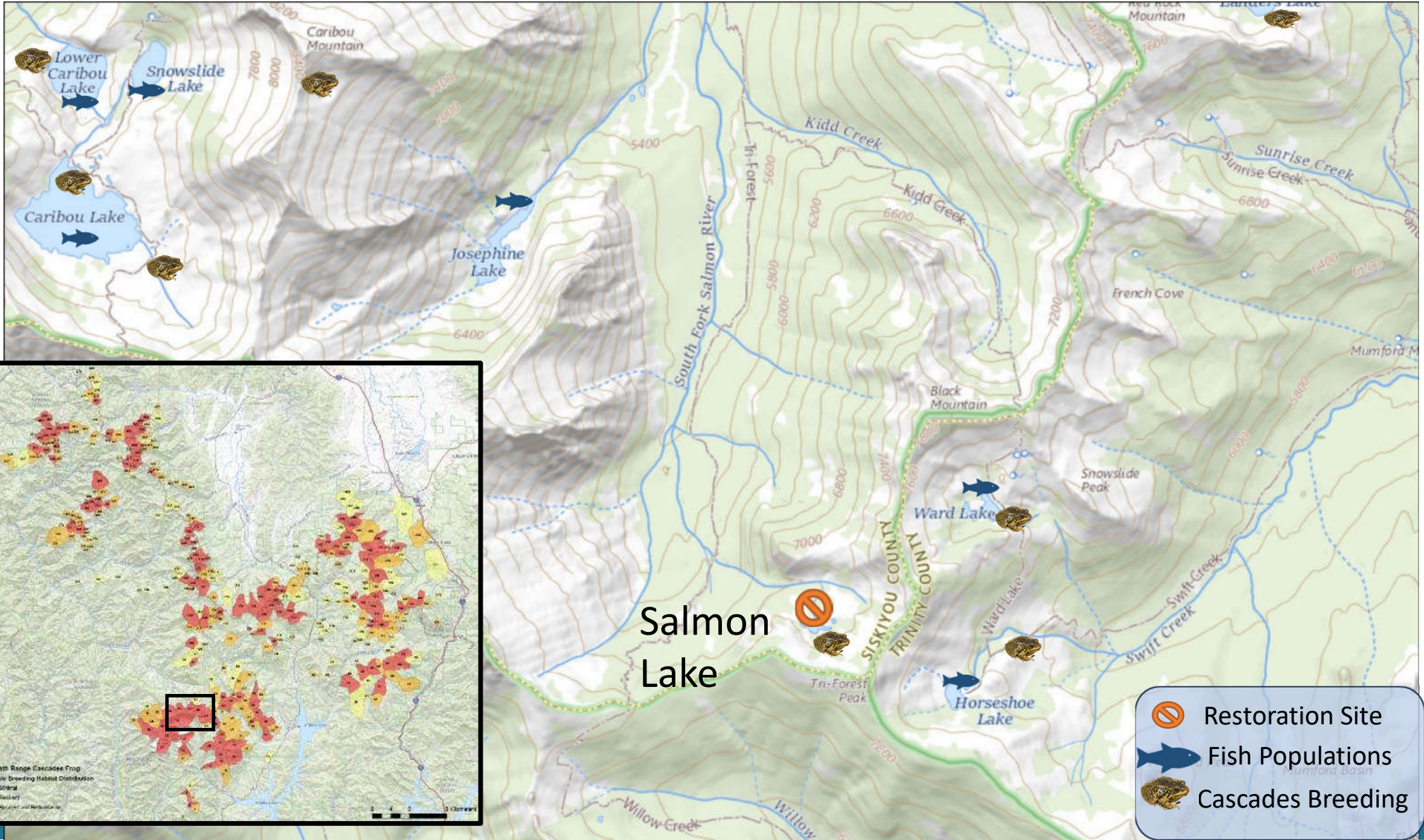


Upper Deadfall Lake




Trinity Alps

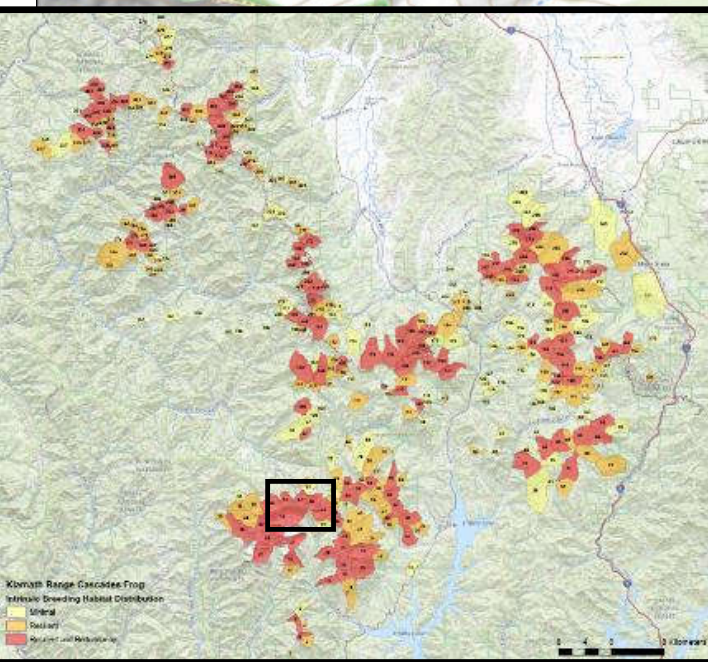
- Salmon Lake (Delayed due to wildfire)
- Forbidden Lakes
- Seven Up Lake
- Doe Lake





Salmon Lake

-  Restoration Site
-  Fish Populations
-  Cascades Breeding



Effort in a broader context

- 8.5 out of 145 feasible hectares (8 out of 124 lakes) will be restored in the next few years
- 8.5 hectares out of 805 total hectares (8 out of 211 lakes) of fish bearing waters to be restored



What to Expect at Restoration Sites

- Gill Nets may be present in the water bodies during restoration
- Look for signs posted by CDFW indicating presence of nets



Shadow Lake



****ATTENTION****



**Amphibian Habitat Restoration Project
2023-2026**

The California Department of Fish and Wildlife is restoring permanent water bodies to provide drought resilient habitat for native wildlife in and around "insert" Basin. Non-native fishes are currently being removed from "insert" Lake and connected waters. This is part of a broader project to ensure resiliency for native amphibians in the face of drought and climate change. Gill nets may be present throughout the lake along the shore, at the surface, and at the bottom. All gill nets will be flagged with this sign. Please use caution in and around the water. If you are seeking recreational fishing opportunity, nearby lakes "insert lakes and distance" contain healthy trout populations. In addition, "insert lakes and distance" are being actively stocked by the California Department of Fish and Wildlife to provide healthy recreational fisheries. Recreate responsibly and enjoy California's natural resources.

For more details regarding this restoration project, contact Adam McKannay Inland Fisheries and Wild Trout Supervisor
(530) 356-5099 R1inlandfisheries@wildlife.ca.gov

Management Moving Forward

1) Maintain Healthy Naturalized Trout Populations

- Remote, little used water bodies

2) Resume Trout Stocking in Select Lakes

- Popular, high use lakes for public benefit

3) Maintain Currently Fishless Waters

- **Free Frog Restoration!**

4) Remove Trout at Critical Climate-Resilient Locations

- Finalize sites began in 2023 in the coming seasons, start a few additional sites



Questions....

justin.garwood@wildlife.ca.gov
braden.herman@wildlife.ca.gov

*Raillardella
pringlei*



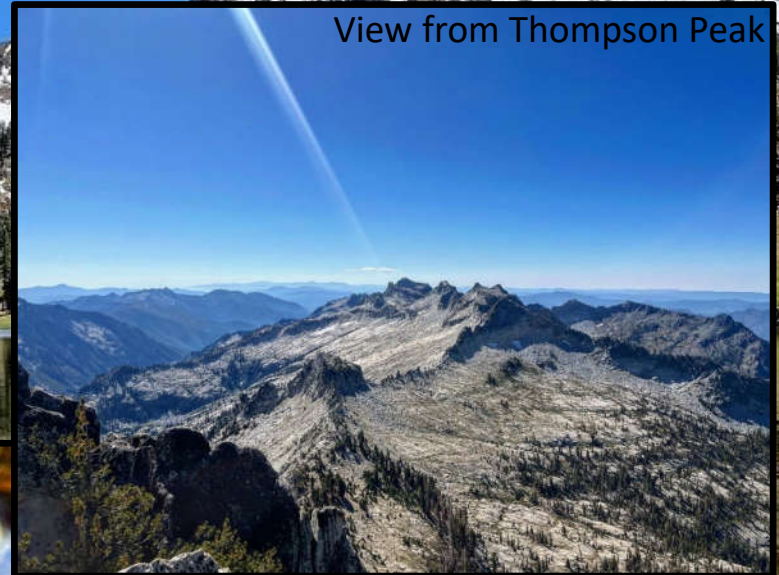
*Gentiana
plurisetosa*



Cascades Frog, Turk Lake



View from Thompson Peak



JUNCTION CITY CAMPGROUND

INVASIVE PLANT PULL VOLUNTEER EVENT

Help us pull invasive Scotch and Spanish broom from the JC Campground River Access and Restoration Site in Junction City.



SATURDAY, APRIL 6 10AM-1PM

Tools, gloves, water, and snacks will be provided. Pulling broom is strenuous and all volunteers are encouraged to bring their own reusable water bottles.

Please direct questions to Duncan McIntosh
530-623-6004 x222 or dmcintosh@tcrccd.net

