

Drought monitoring, impacts, and rescues of California Redband Trout



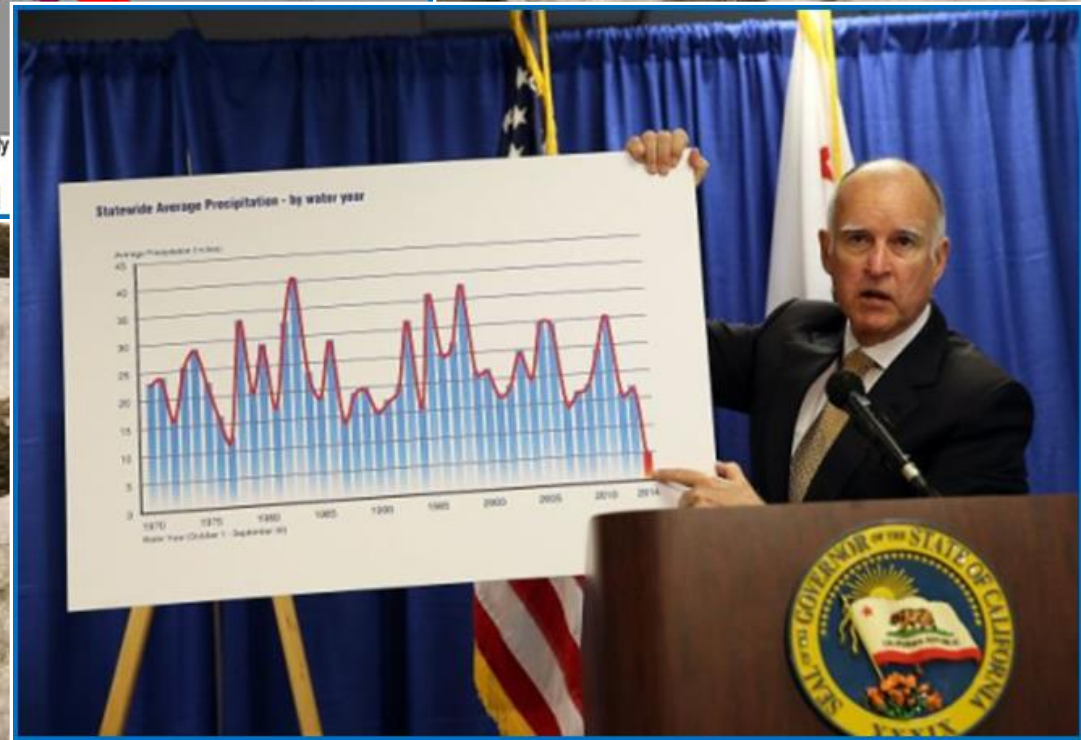
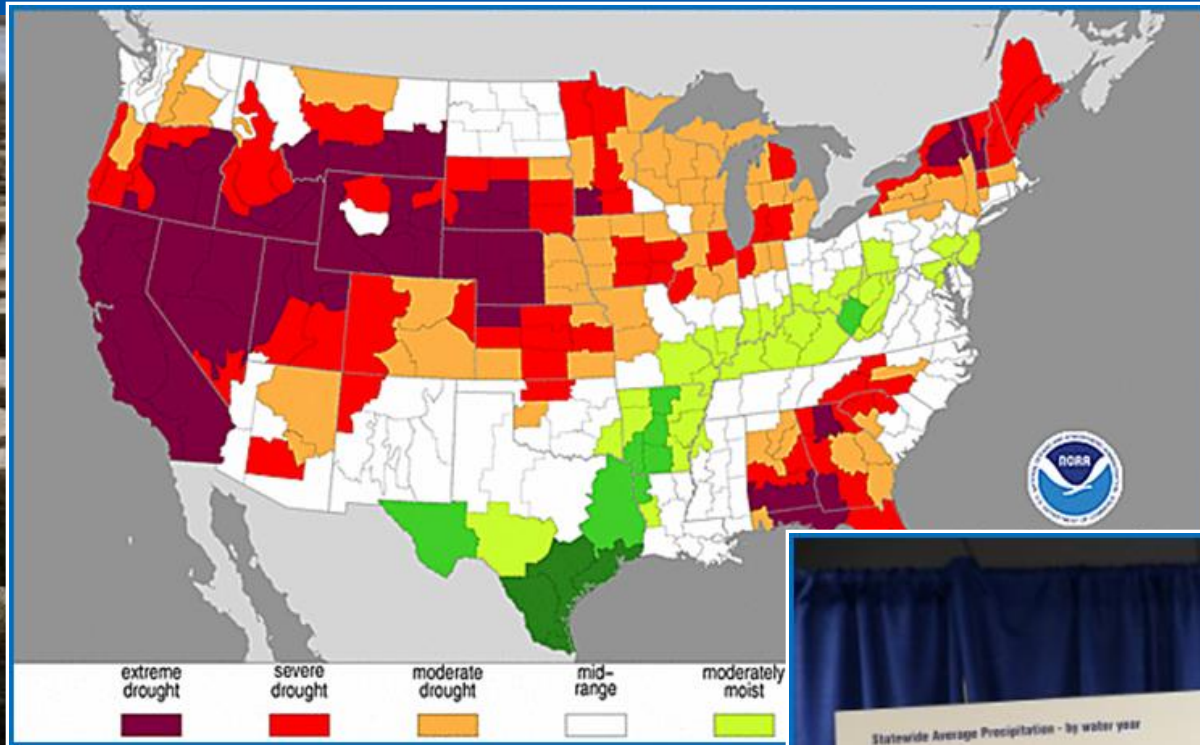
Sheepheaven Creek



Edson Creek

Michael Dege
California Department of Fish and Wildlife

California's Ongoing Drought



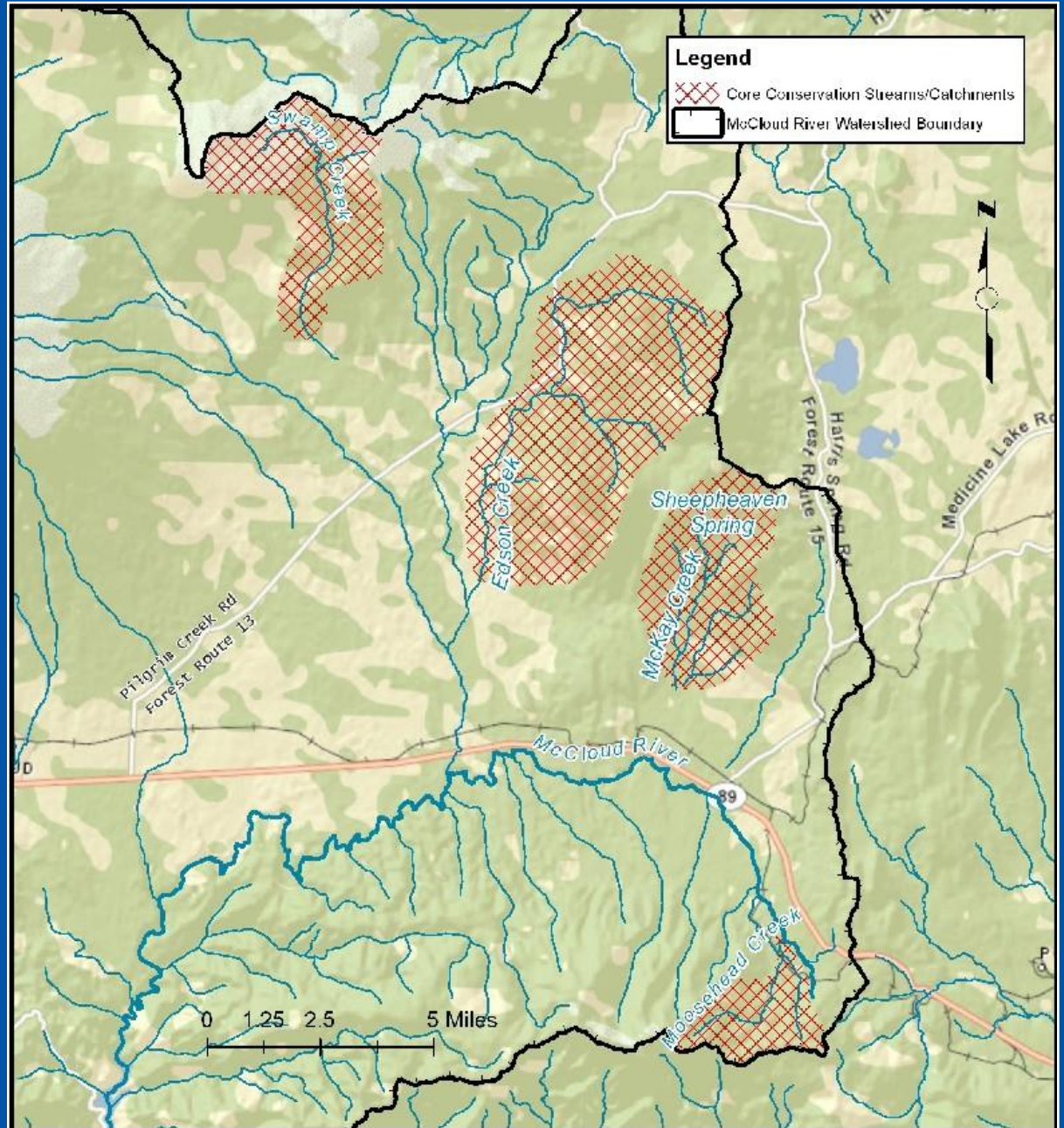
Upper McCloud Watershed

65 Miles north of
Redding, CA

Small isolated spring
streams

McCloud Redband – SSC

Dr. Behnke *O. m. stonei*



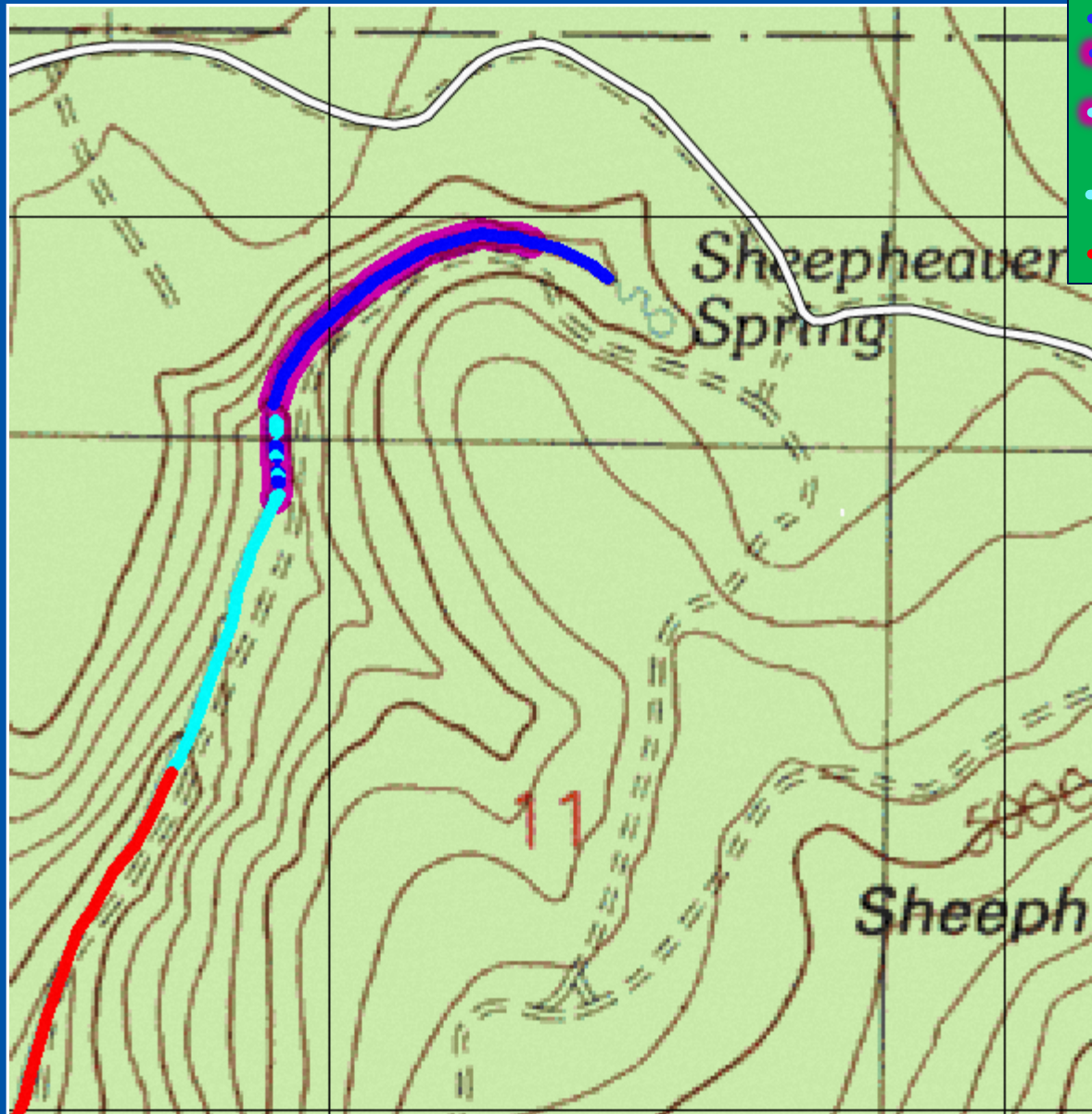
Sheepheaven Creek

January 7, 2014



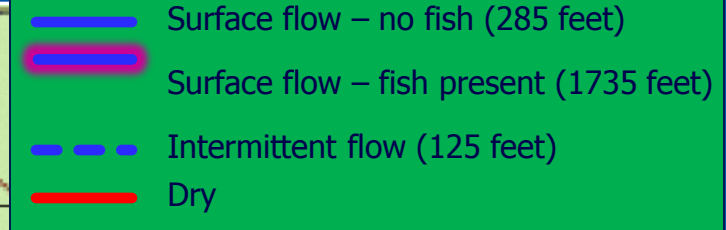
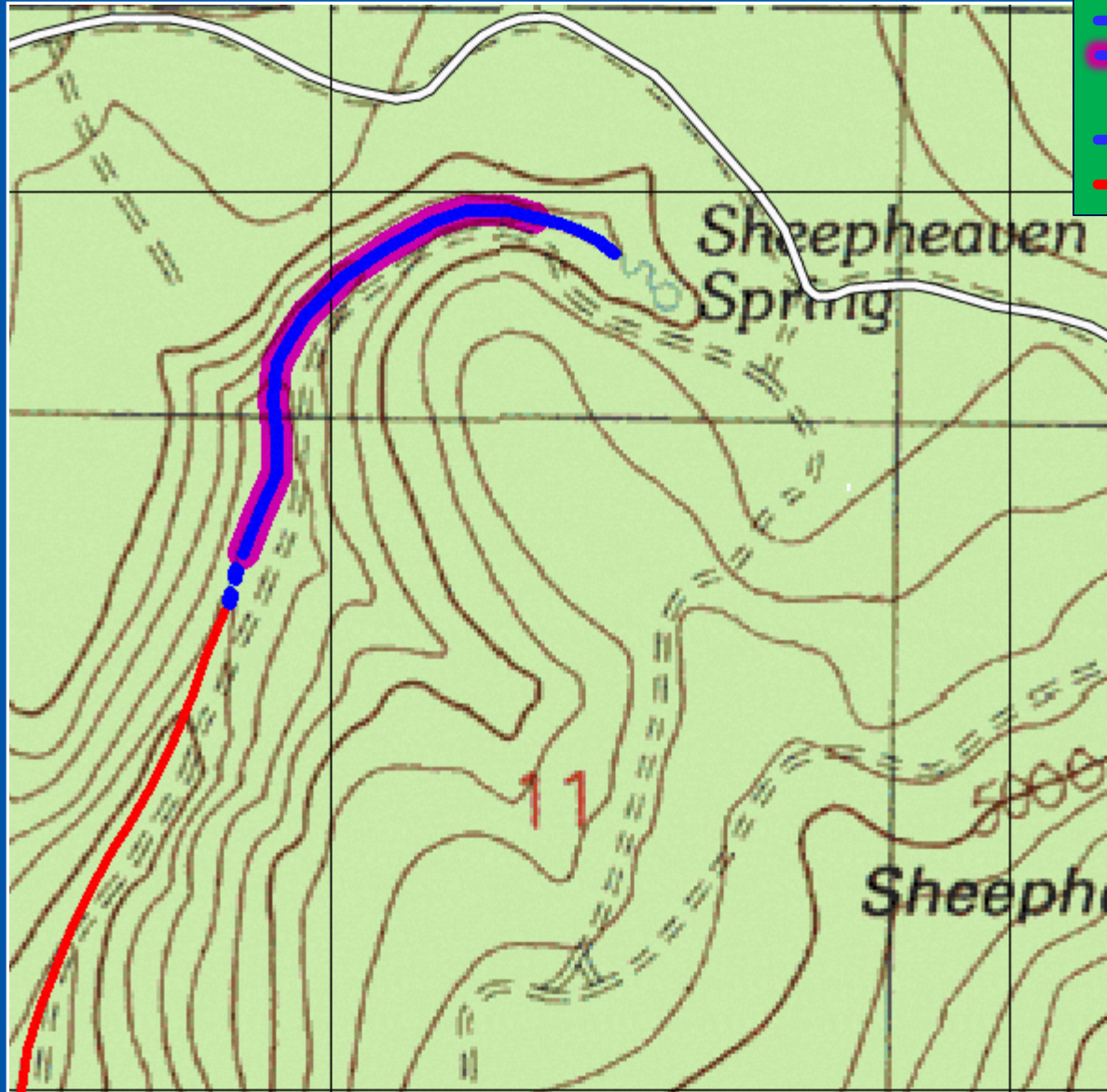
Sheepheaven Creek

January 7, 2014



- Surface flow – no fish (285 feet)
- Surface flow – fish present (1125 feet)
- Intermittent ice (265 feet)
- Solid ice (1000 feet)
- Dry





Assessing/Implementing Fish Rescues (cont.)

CDFW Fish Rescue Matrix

- General guidance
- Three levels of evaluation (monitoring, translocation, rescue)
- Flexibility and professional judgement

Level 1 (Monitoring at risk populations)

Action	Trigger	Response	Peripherals
If a water is considered 'at risk' and is occupied by state or federally listed species, native species, or species of special concern, conduct onsite evaluations to assess existing instream habitat condition and flows at various locations and across seasons	Surveys find flow conditions that will likely allow populations to persist across seasons and not lead to adverse effects and/or loss of the population	Continue monitoring at intermittent intervals, based on season and localized flow/discharge (resources permitting)	Special considerations should be made to assess impacts to fish distribution/persistence in relation to barriers (natural/manmade) and overwinter survival
	Surveys find low or intermittent flow, potential stranding, and/or disconnection of wetted habitats that will likely lead to adverse effects to, and potential loss of, the population	Evaluate potential areas for translocation, assess disease threats, estimate logistical needs/procedures, and evaluate contribution/value of the extant population to the persistence of the species or strain	Significant effort should be placed into estimating timelines associated with desiccation and urgency of threat
Evaluate potential areas for translocation, assess disease threats, estimate logistical needs/procedures, and evaluate contribution/value of the extant population to the persistence of the species or strain	Population is essential to maintain species, strain, or "meta" population recovery and conservation	Initiate Level 2 translocation evaluation	Consideration of individual population's role in a disconnected "meta" population should be considered. Loss of unique alleles/genetic diversity and or numbers of adults collectively could be significant
	Population is not essential to species or meta population recovery and conservation	Continue monitoring at intermittent intervals, based on season and localized flow/discharge if resources are available (Level 1 monitoring)	

Assessing/Implementing Fish Rescues

Implementing McCloud Redband rescues

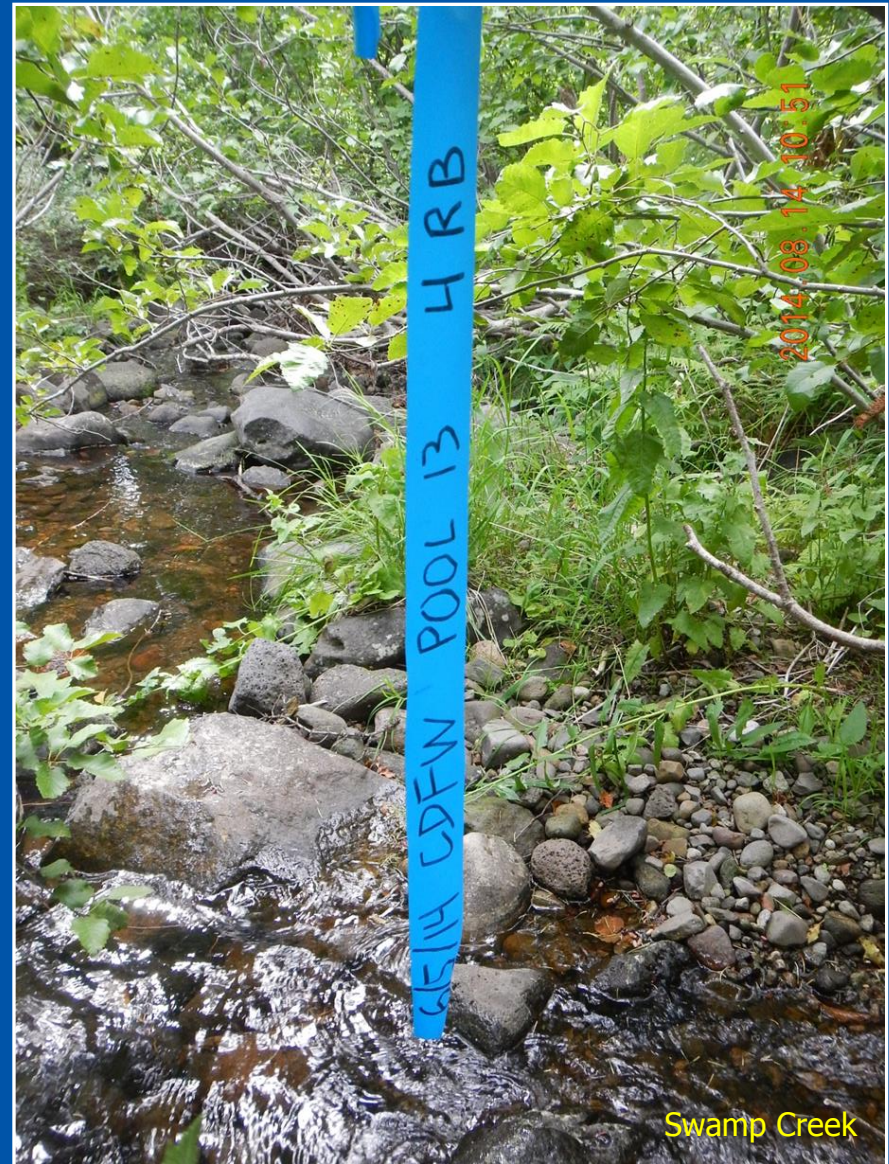
- Species risk level – high risk species, genetically unique
- Observed and predicted habitat conditions (repeated)
- Historical information (1977, 1987-92)
- Risk to rescue
- Conditions compromise fish health and biological function = rescue



Assessing/Implementing Fish Rescues (cont.)

McCloud fish rescues (3 options):

- Instream relocation
- In-basin relocation
- Hatchery relocation



Hatchery Operations – Mt. Shasta

Self contained McCloud Redband isolation tanks

- Size class and stream isolation
- Production → conservation hatchery practices



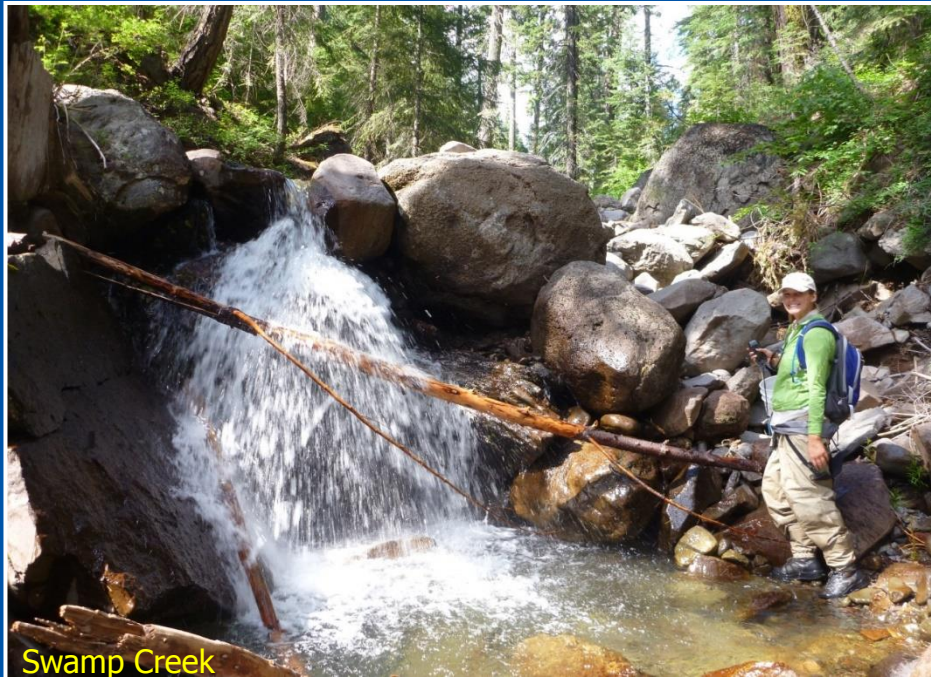
2013-15 McCloud Redband Rescues

	Edson*	Moosehead*	Sheepheaven*	Swamp*	
Instream translocation	131	45	52	249	554
In-basin translocation			77		
MSH translocation	224	285		534	1043
					1597

* size class shift

Reintroduction

- Reintroduction strategy/criteria (environmental/biological data, 2013 Reintroduction Plan)
- Predictive/forecast approach with ground truthing
- One year/seasonal is as much as you can buy



Next Steps

Short-term solutions

- Reintroduction
- Stream refugia pools
- Barrier removal
- Increasing genetic diversity



Long-term solutions

- Angling regulations
- Conservation Agreement
- Increasing genetic diversity – HGMP
- Reclaiming historic habitat

But, the drought is not
over...

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Moosehead Creek