

# Quantifying Instream Flow Needs in the Deschutes Basin



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# Quantifying Instream Flows

- Why instream flow matters
- Scientific approaches
- Negotiating the social/political landscape
- Whychus Creek & the Upper Deschutes River





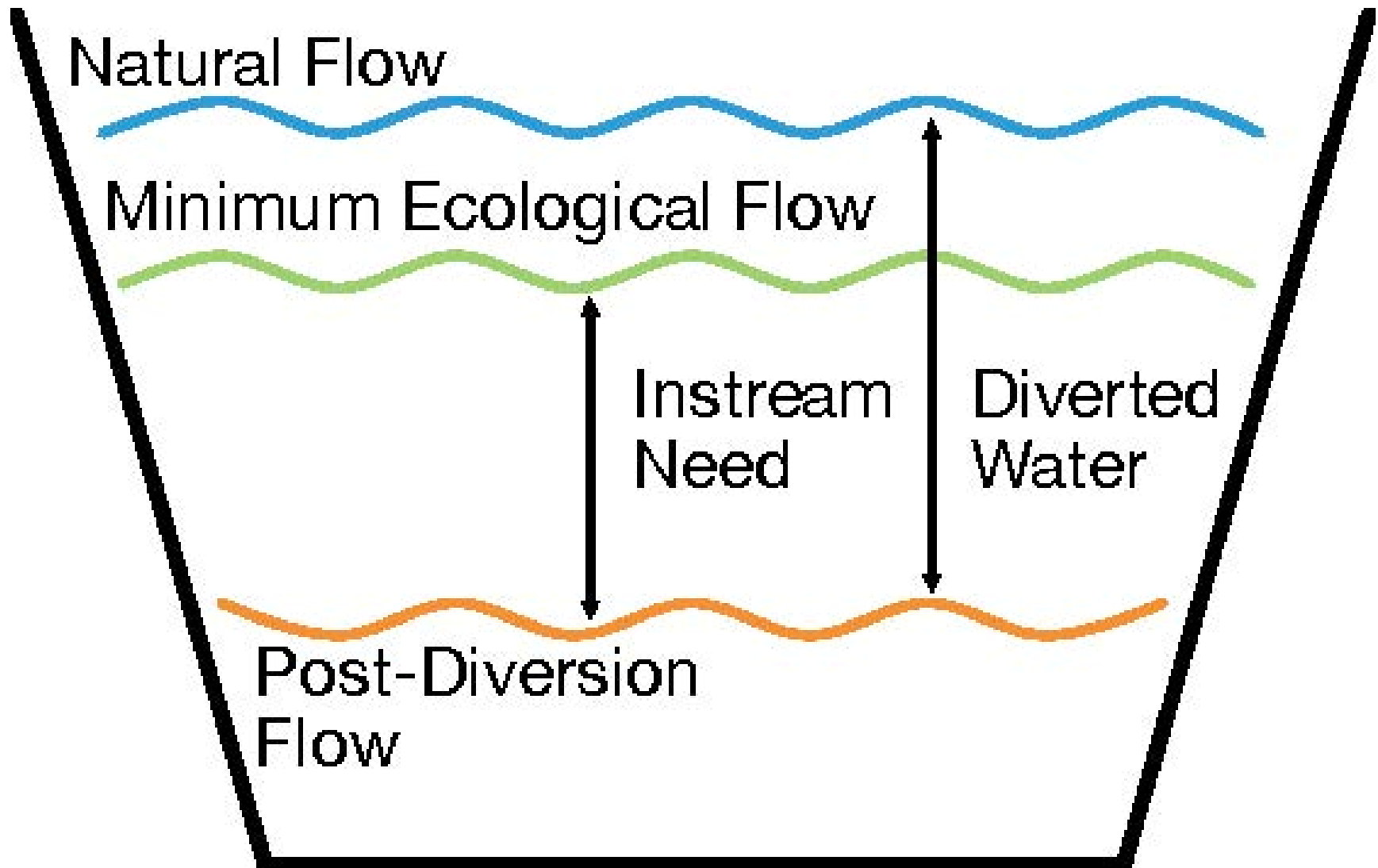
# Upper Deschutes Basin



17,222 km<sup>2</sup>

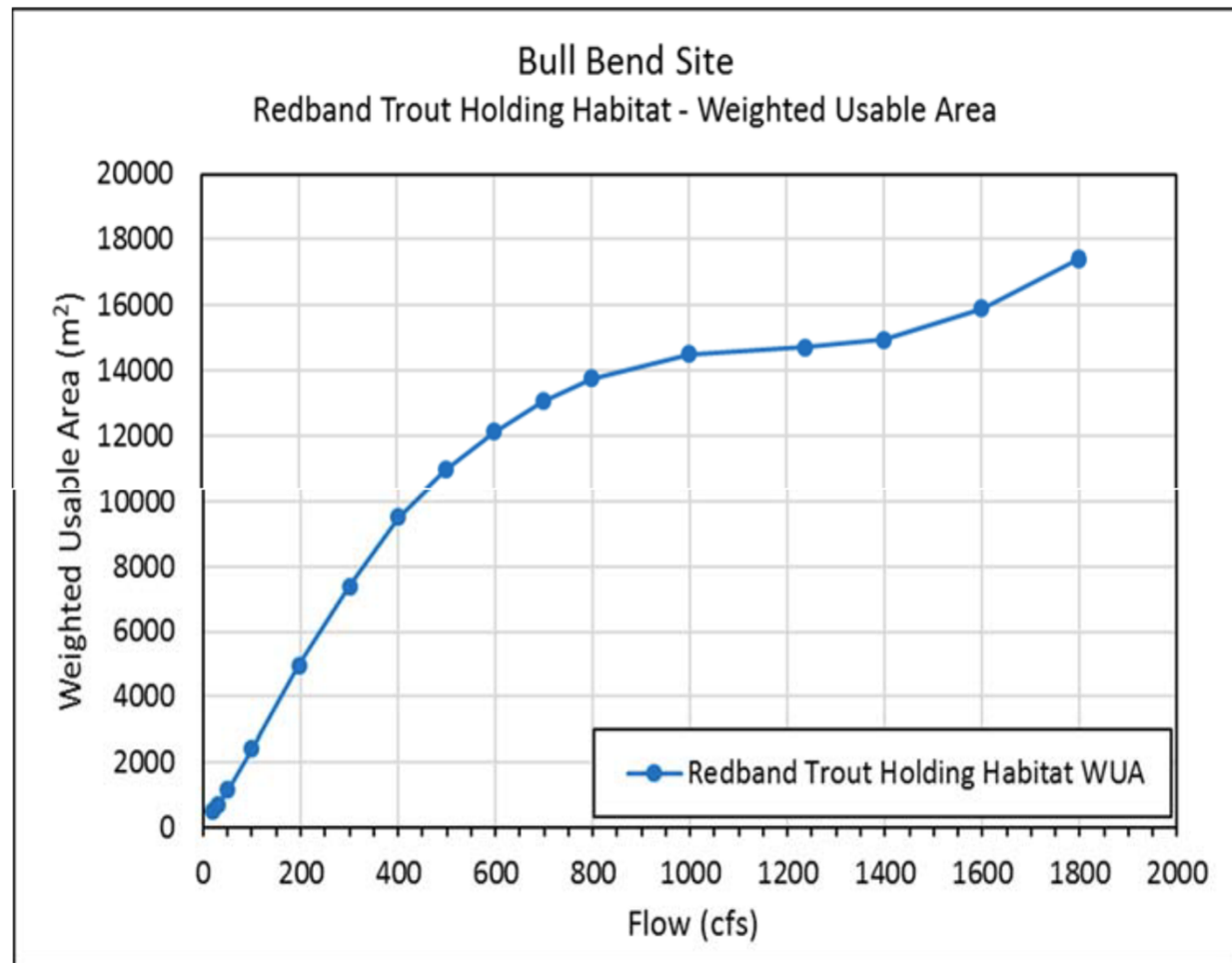


# Setting Flow Targets



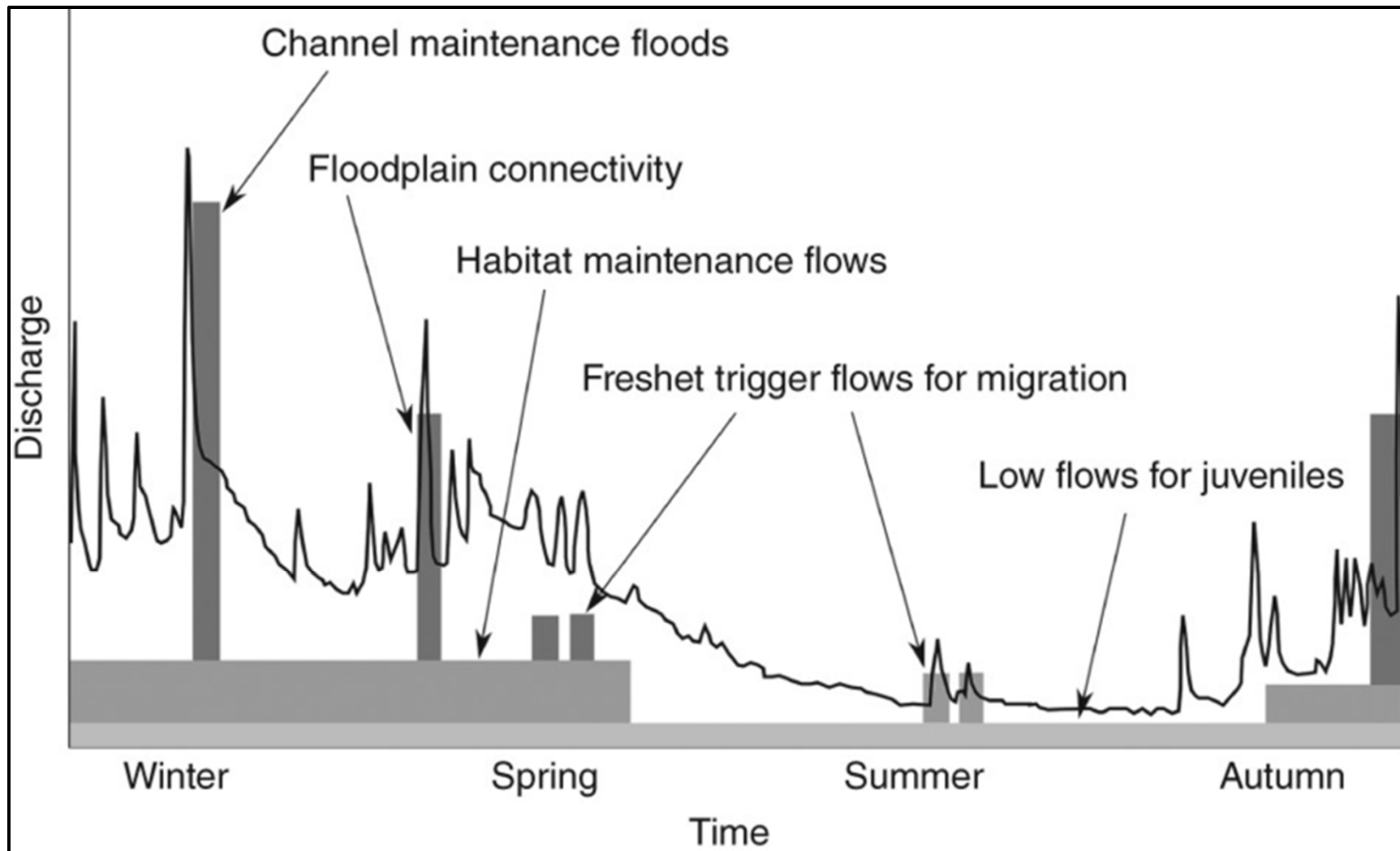
# Quantifying Instream Flow Needs

- “Low-flow approaches” (ex. Tennant Method, Oregon Method)
- IFIM approaches: Analyzing habitat over a range of flows for life cycle needs of a species (Instream Flow Incremental Methodology w/ PHABSIM)



# Quantifying Instream Flow Needs

Ecological flow assessments for a variety of values (ELOHA)



# Oregon's Policy Framework

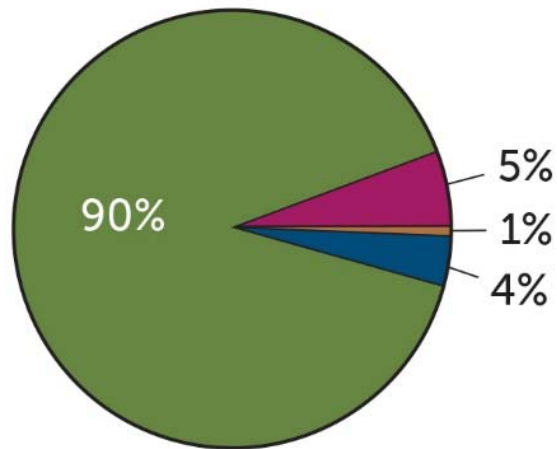


- ▣ 1955 Minimum Perennial Streamflow Act
- ▣ 1987- Instream Water Rights Act
  - A scientific AND political process
  - Junior priority dates
  - DRC has used these as initial targets
  - Others drivers: ESA, CWA, Wild & Scenic Flows

# Supply & Demand Imbalance

## BASIN WATER RIGHTS DISTRIBUTION

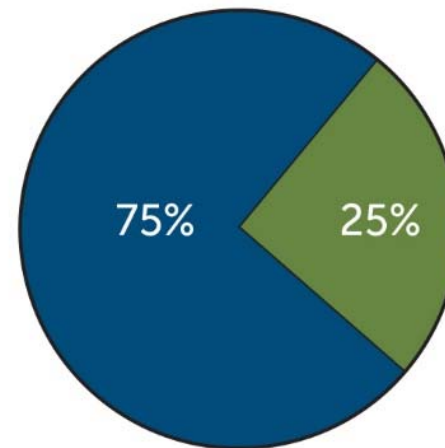
AS OF 2006 DESCHUTES WATER ALLIANCE STUDIES



- Agricultural
- Municipal & Industrial
- Resorts
- Instream

## ESTIMATED SUPPLY SHORTFALLS

2006 DESCHUTES WATER ALLIANCE STUDIES (TO 2025)



- Agricultural, Municipal & Industrial and Resorts (combined)
- Rivers

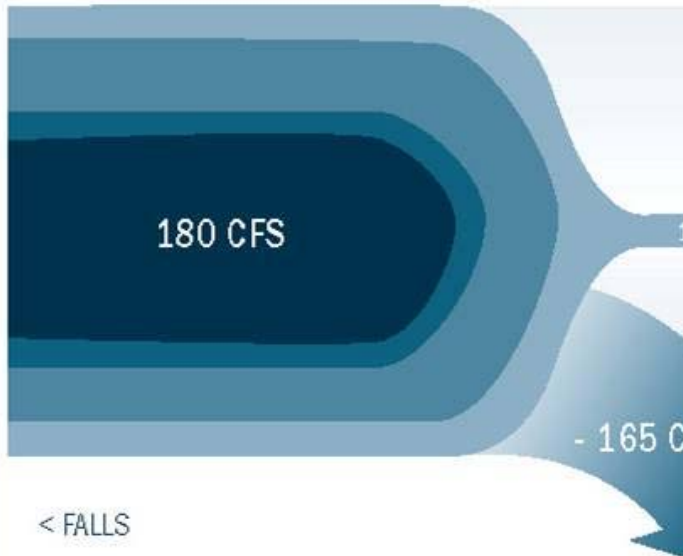


# Whychus Creek

Natural Flows from the  
Headwaters of Whychus Creek  
in the Three Sisters Wilderness

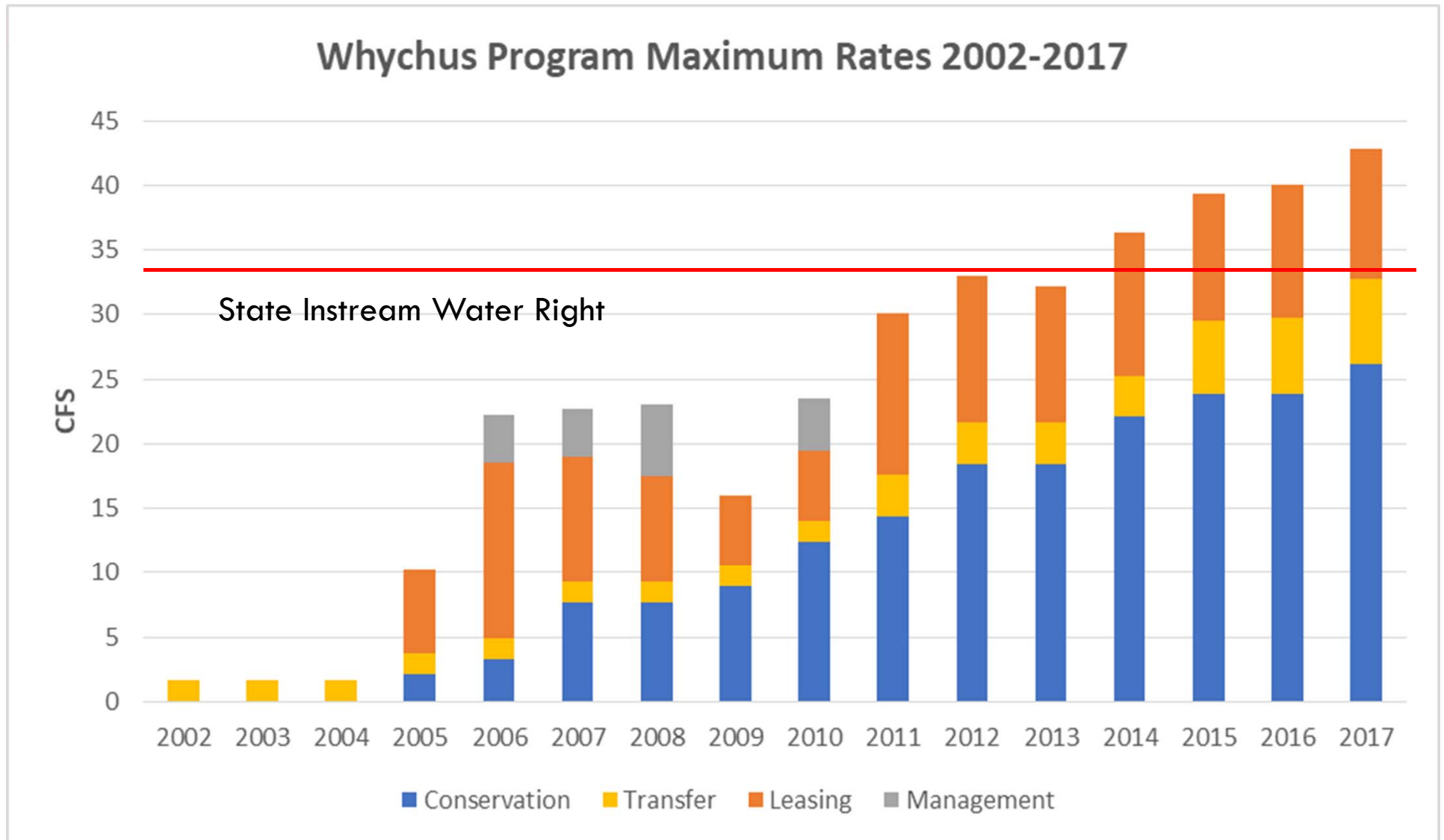
Primary Irrigation Diversions  
and City of Sisters

Natural Flows from  
Alder Springs

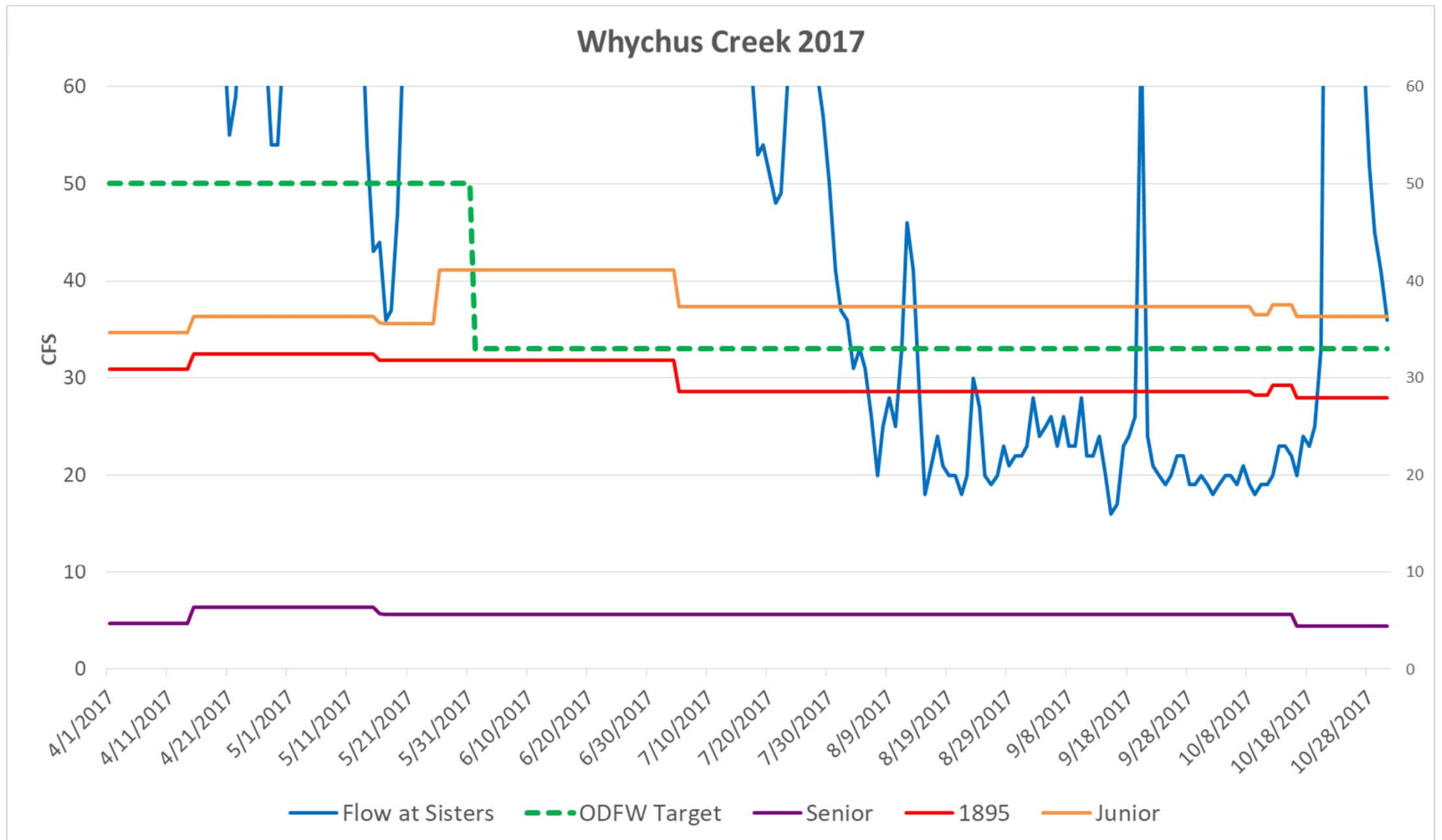


S RIVER  
> CONFLUENCE >

# Flow Restoration to Date



# “Wet” Water Results



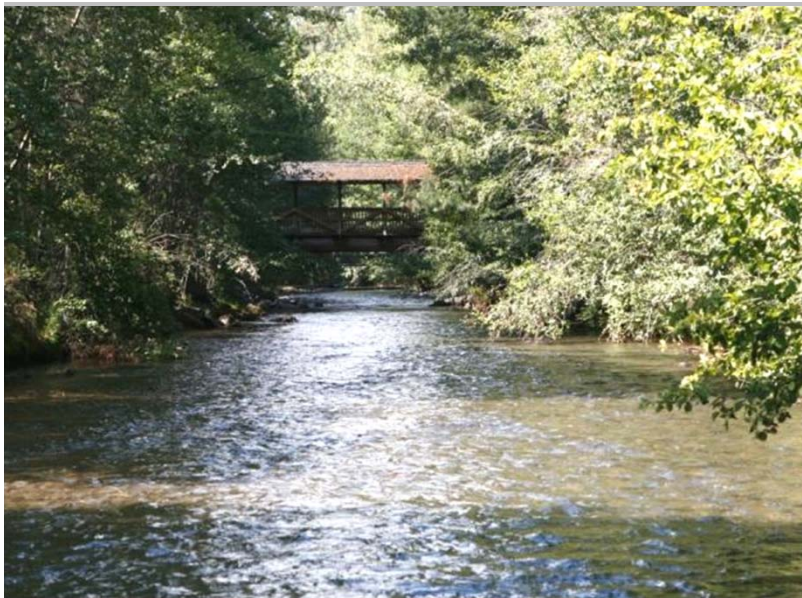




8 cfs



20 cfs



33 cfs

# Camp Polk Preserve





# Limitations of Flow Target (33 cfs)

- ❑ Established for redband trout
- ❑ Reintroduction of ESA-listed steelhead in 2007
- ❑ Target insufficient to achieve temperature criteria



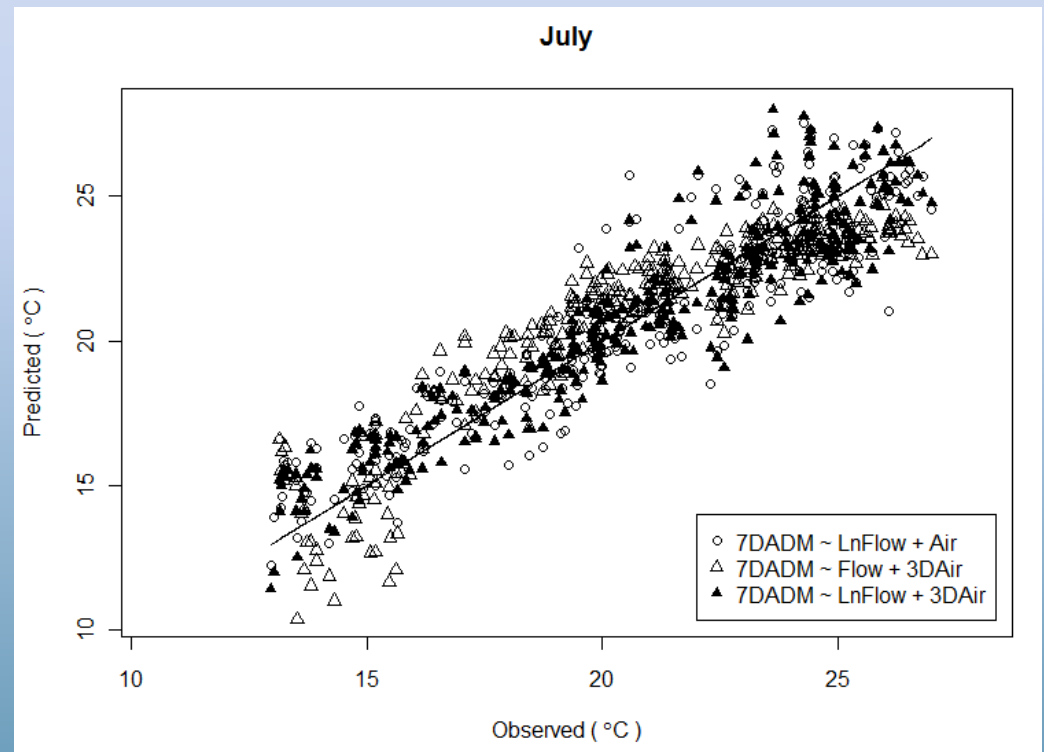


# THE UPPER DESCHUTES BASIN STUDY

Water for agriculture, rivers & cities

## Whychus Creek Temperature Assessment

- Evaluate the impacts of air temperature and streamflow on stream temperatures for Whychus.
- Regression equations will support evaluation of impacts to stream temperature from climate change and water resource scenarios.



UPPER DESCHUTES  
WATERSHED COUNCIL

# Outcomes for Whychus Target?



*Connecting Central Oregon's Water, Land & Environment*



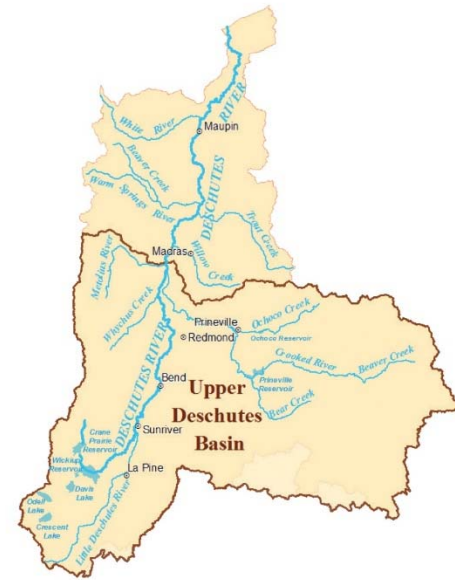
*Discussing Water Rights, A Western Pastime*

**2018**  
DESCHUTES BASIN HABITAT CONSERVATION PLAN  
**UPDATE**





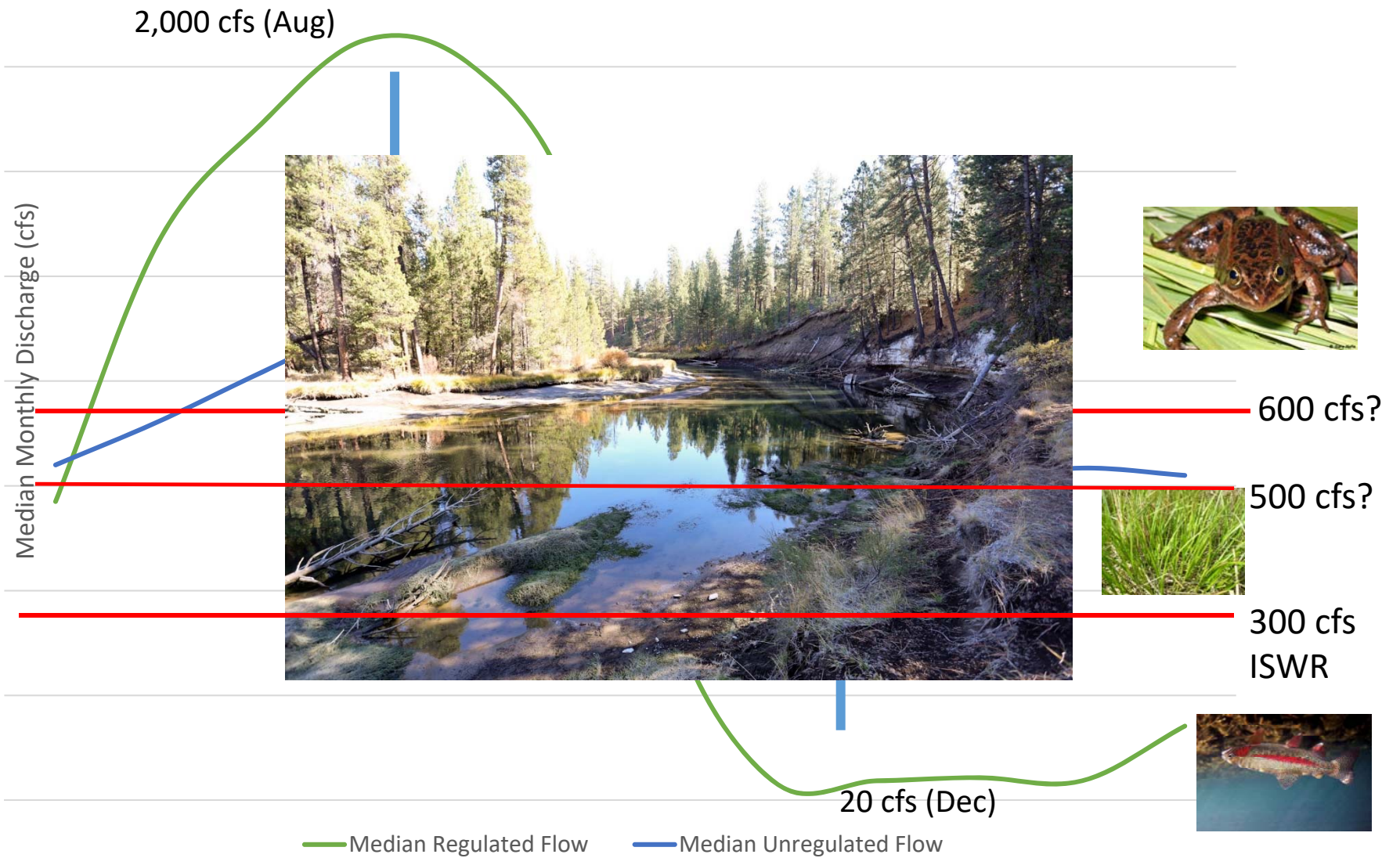
Upper Deschutes  
Low Winter Flows



Upper Deschutes  
High Summer Flows



# Median Monthly Flows In Upper Deschutes





# Upper Deschutes Ecological Assessment

- Flow-habitat relationships



- How does flow affect river and riparian wetland interaction and potential emergent vegetation recruitment?

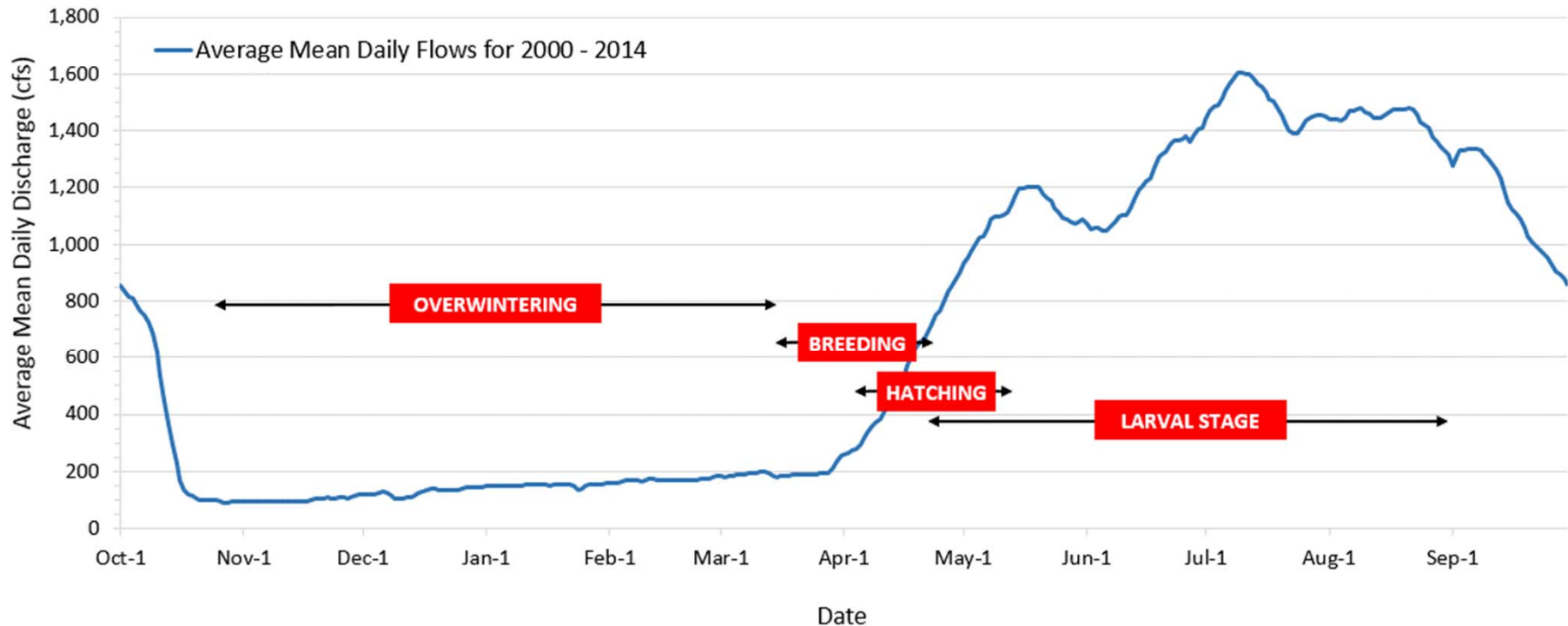
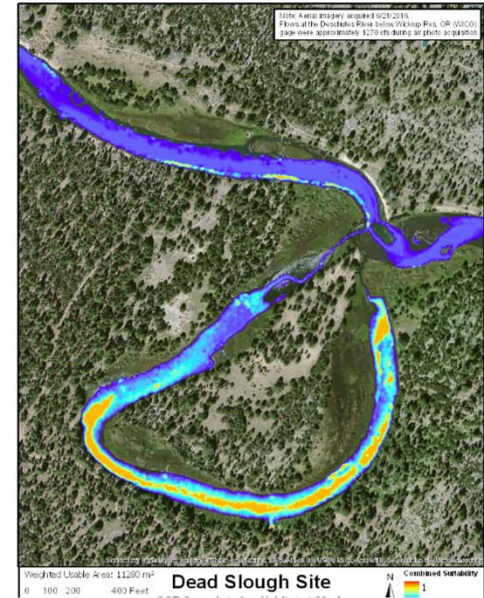


THE UPPER DESCHUTES  
**BASIN STUDY**  
Water for agriculture, rivers & cities

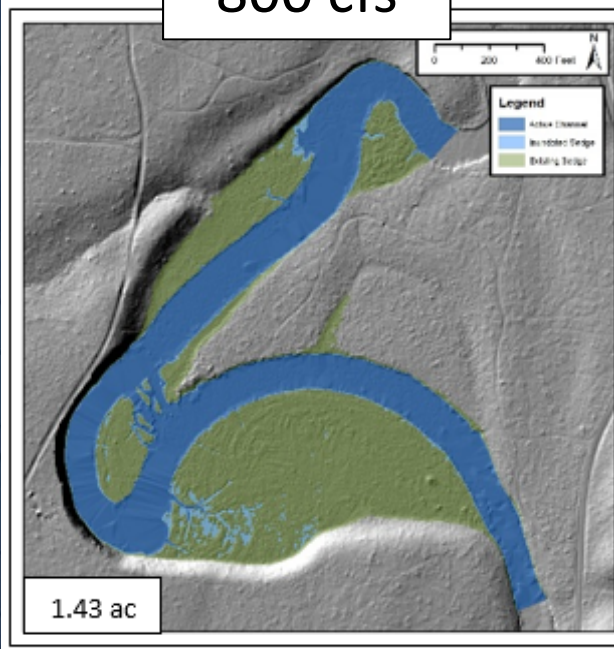


# Oregon spotted frog

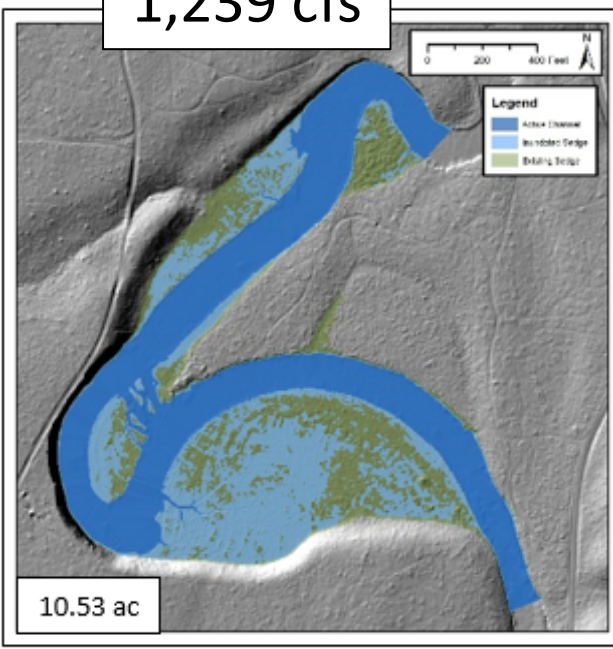
- Breeding and overwintering periods
- Depth, velocity, substrate, distance to cover
- Estimated habitat (WUA) at various flows



800 cfs



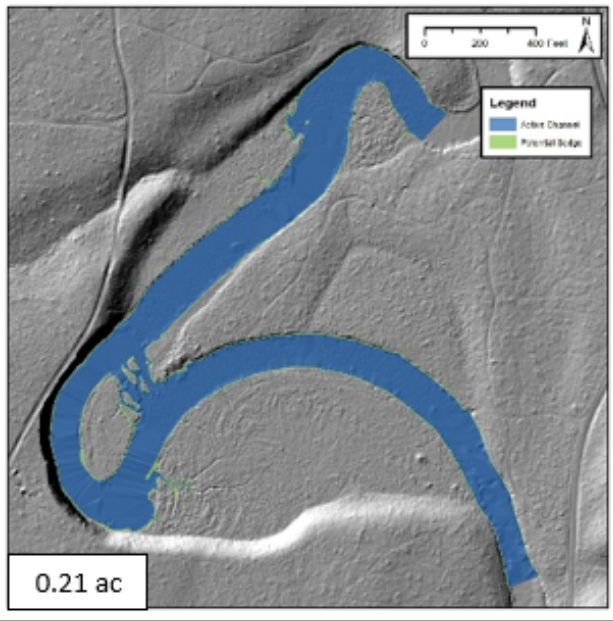
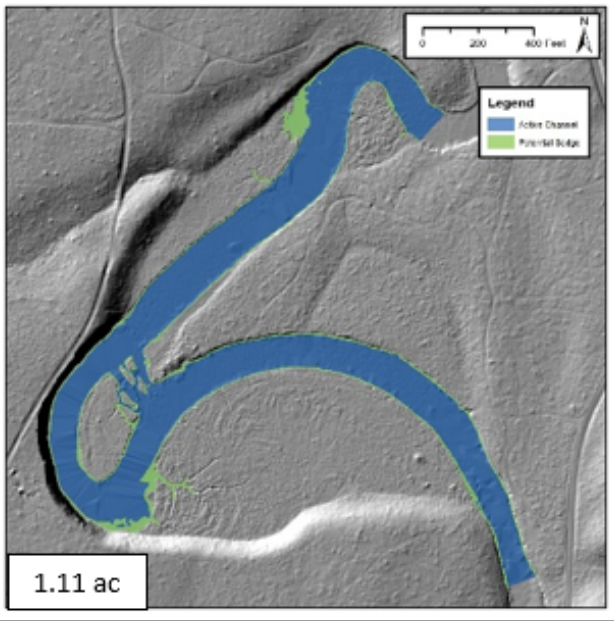
1,239 cfs



# Riparian Analysis

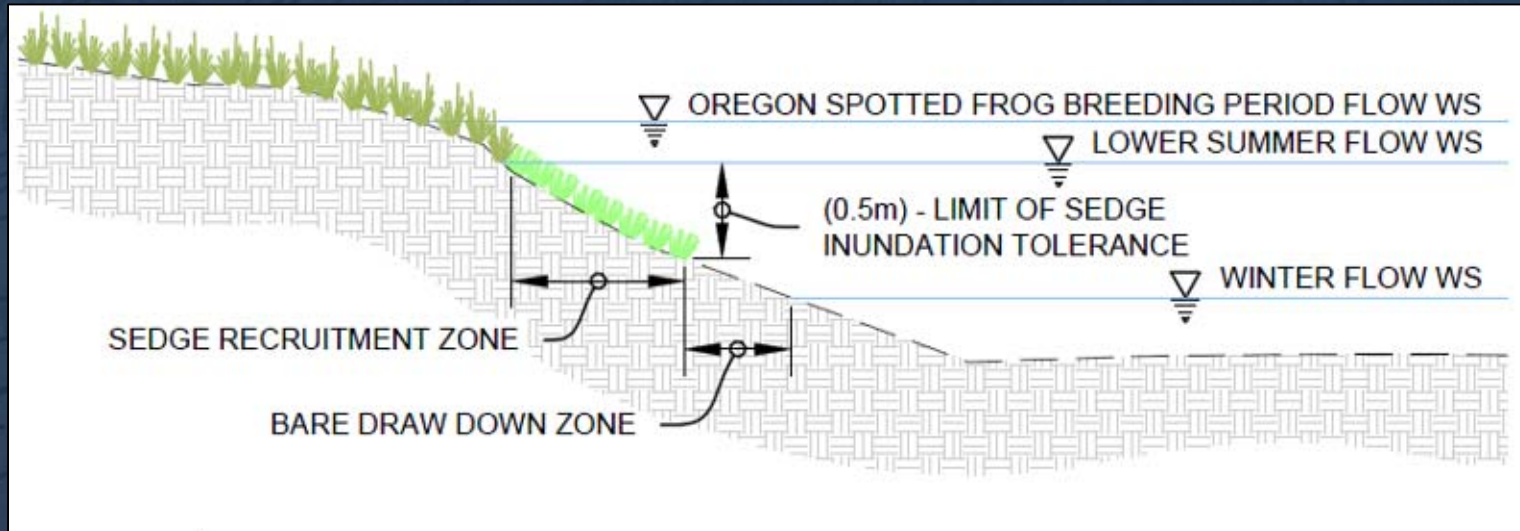
Interaction with  
veg at current  
flow regime

Veg recruitment  
at lower summer  
flows

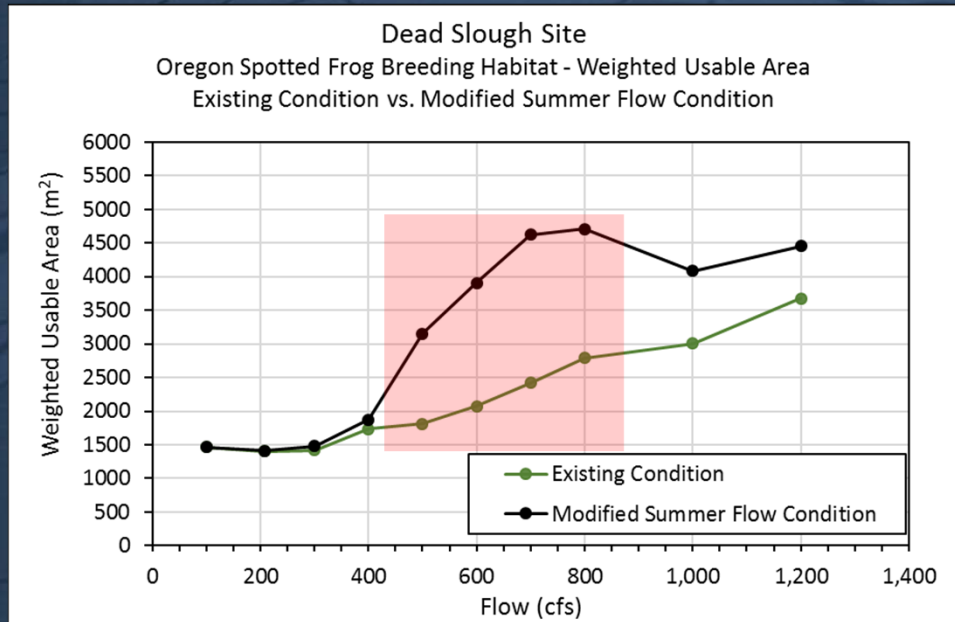




# Modified Flow Regime



Potential Condition: Lower Summer Flow, Higher Breeding Period Flow, and Higher Winter Flow



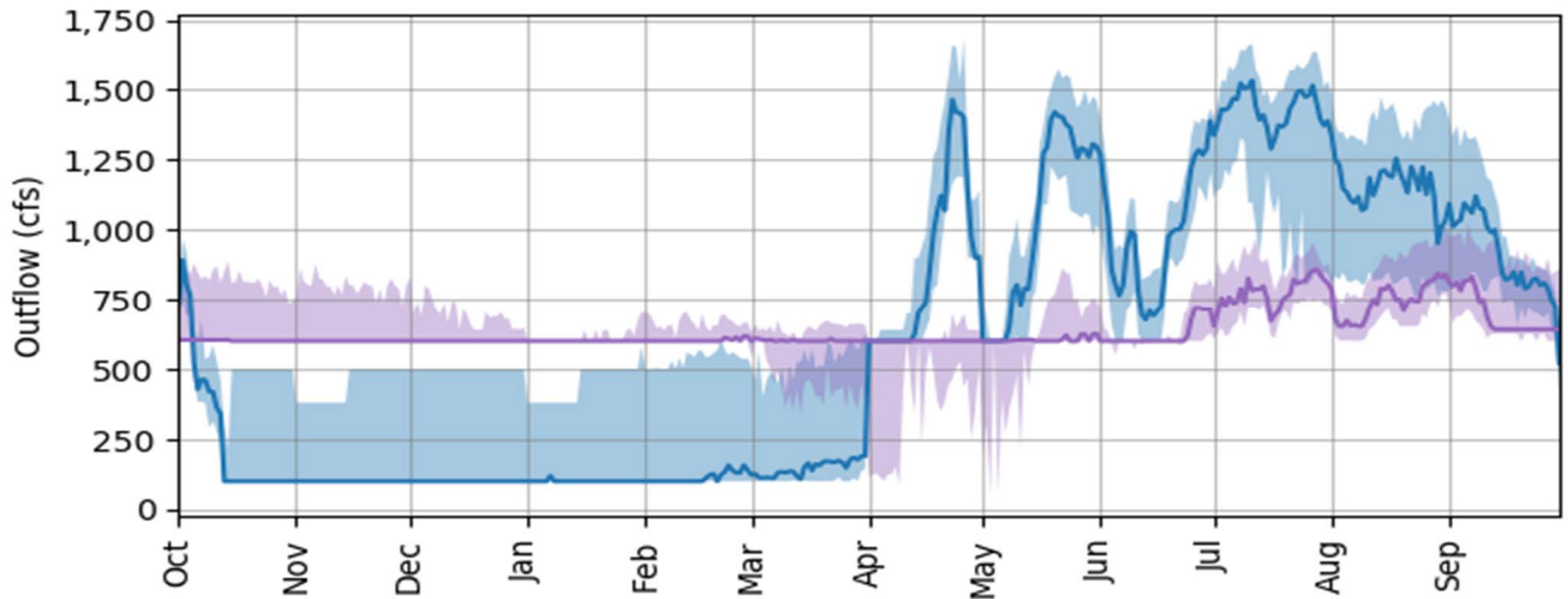
# What Flows are Possible? Water Management Modeling Scenarios

Goal: 600 cfs in  
Upper Deschutes  
below Wickiup

Preliminary Draft Results for Discussion  
Purposes – Not for Distribution



Not possible in dry  
years; consider  
variable flow target?





# Outcomes for Deschutes Target?



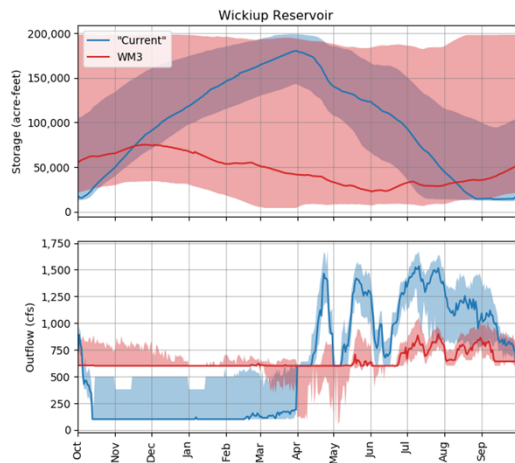
*Connecting Central Oregon's Water, Land & Environment*



**2018**

DESCHUTES BASIN HABITAT CONSERVATION PLAN

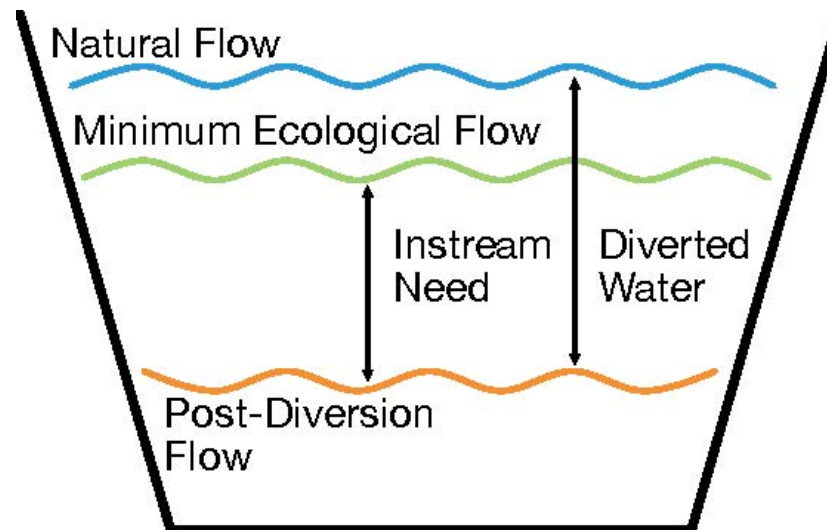
**UPDATE**



*Discussing Water Rights, A Western Pastime*

# Considerations

- Integrate flow and habitat work
- Variety of scientific approaches available
- Target-setting is a scientific, social and political process. Information helps.
- Balancing instream/out of stream needs. Partnerships!



# Questions?

