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 km²
Setting Flow Targets

- Natural Flow
- Minimum Ecological Flow
- Instream Need
- Diverted Water
- Post-Diversion Flow
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

90%

5%
1%
4%

Agricultural
Municipal & Industrial
Resorts
Instream

ESTIMATED SUPPLY SHORTFALLS
2006 DESCHUTES WATER ALLIANCE STUDIES (TO 2025)

75%
25%

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

180 CFS

< FALLS
Flow Restoration to Date

Whychus Program Maximum Rates 2002-2017

State Instream Water Right
“Wet” Water Results

Whychus Creek 2017

Flow at Sisters  ODFW Target  Senior  1895  Junior
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
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.
Outcomes for Whychus Target?

Connecting Central Oregon’s Water, Land & Environment

2018
DESCHUTES BASIN HABITAT CONSERVATION PLAN UPDATE

Discussing Water Rights, A Western Pastime
Upper Deschutes
Low Winter Flows

Upper Deschutes
High Summer Flows
Median Monthly Flows In Upper Deschutes

- Median Monthly Discharge (cfs)
  - 2,000 cfs (Aug)
  - 600 cfs?
  - 500 cfs?
  - 300 cfs
  - 20 cfs (Dec)

Median Regulated Flow
Median Unregulated Flow

ISWR
Upper Deschutes Ecological Assessment

- Flow-habitat relationships

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

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

Dead Slough Site
Oregon Spotted Frog Breeding Habitat - Weighted Usable Area
Existing Condition vs. Modified Summer Flow Condition
What Flows are Possible?
Water Management Modeling Scenarios

Goal: 600 cfs in Upper Deschutes below Wickiup

Not possible in dry years; consider variable flow target?

Preliminary Draft Results for Discussion Purposes – Not for Distribution
Outcomes for Deschutes Target?
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?