Fish Bioenergetics: An Examination of Salmonid Foraging Behavior

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Resident Coastal Cutthroat Trout
*(Oncorhynchus clarkii clarkii)*

- **Upstream feeders**
  - Hold focal point

- **Invertebrate drift**
  - Distribution assumption

- **Habitat (channel) complexity**
  - Differences in velocity
  - LWD/logjams
Study Questions

• Drift vs velocity
  – Relationship?

• Foraging distance vs amount and size of drift
  – More food -> Decreased foraging distance?
  – Larger food -> Increased foraging distance?

• Foraging vs velocity
  – Where do fish sit and eat?
Catch My Drift?
Velocity
Trials

1. Existing conditions
   - No changes; videogrammetry & drift collection

2. Supplemented drift
   - 550%; videogrammetry & drift collection

3. Increased channel complexity
   - Added boulder; videogrammetry
Pool Setup

Trials 1 & 2

Trial 3
Drift by Count

- Ephemeroptera: 98% Supplemented Drift, 18% Naturally Occurring Drift
- Plecoptera: 2% Supplemented Drift, 46% Naturally Occurring Drift
- Diptera: 0% Supplemented Drift, 25% Naturally Occurring Drift
Drift Length Distribution
Supplemental Drift: 6.40 mm

Naturally Occurring Drift: 4.20 mm
Relationship between drift and velocity?

ANOVA of different velocities (p = 0.031)
Rejects previous assumptions!
Does foraging distance change with drift amount or size?
Were Foraging Distances Dependent on Length?
Velocity contours before and after boulder addition

Trials 1&2

Trial 3
Where are fish sitting and eating?

• Appeared to sit in lower velocities
  – Often behind or in front of rocks

• Ate seemingly everywhere
  – Surface, bed, fast, slow

• More analysis needed
Key Findings

• Drift was significantly different across velocities

• Foraging distance decreased when drift amount and size were increased

• Fish sat in lower velocities and often ate in faster flows
Future Analysis/Study

• Matching fish locations with velocities

• Larger sample of foraging distances

• Bottom eats

• More robust datasets
Questions?
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