Snow2Flow in the Upper Columbia

Upper Columbia Salmon Recovery Board
Columbia River Policy Advisory Group (CRPAG)
Quarterly Meeting
December 7, 2021
Tier 1 Restoration Priority Areas
And
USFS-Managed Lands
Upper Columbia Salmon Prioritization

- 191 priority reaches
- 85% reaches limited by streamflow
- 75% reaches limited by temperature
Goal for Snow2Flow

Tool for partners to explore how forest management can enhance streamflow in the Upper Columbia
What is Snow2Flow?

Snow2flow
Understand Implications of Forest Management On Stream Flows In The Upper Columbia Basin

LAUNCH
Distributed Hydrology Soil and Vegetation Model (DHSVM)

DHSVM benefits:
1. Incorporates different sub-daily weather, aspect, etc.
2. Simulates sub-daily flow
3. Dry, average, and wet year simulation
Forest Treatments Overview

1. No treatment
2. Maximum biomass 16 inch limit
3. Maximum biomass 25 inch limit
4. Burn only
5. Ideal water
A LEGEND

Proposed Vegetation Treatments (OS, US, Fire Rx)

- Machine Pile Burning/Commercial Thin
- Hand Pile Burning/Stand Improvement Thin
- RR Machine Pile Burning/RR Thin
- Underburning only
- Wyden Underburn
- RR Underburning only
DHSVM Results

NSE = 0.758
DHSVM Results

Nash Sutcliffe Efficiency:
1. Wenatchee: 0.796
2. Entiat: 0.758
3. Methow: 0.630,
   a. 0.879 (monthly)
4. Okanogan: lacked continuous observations
Snow2Flow Interface

Snow2flow
Understand Implications of Forest Management On Stream Flows In The Upper Columbia Basin

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Snow2Flow Interface

Two Primary Pathways:
1. Draw treatments
2. Upload treatments
Example: Twisp River Restoration Project
Snow2Flow Moving Forward

1. Outreach to partners
2. Watershed Program
Feedback and Questions?
Updates Walk Through: Screen shots
Direct Forest Restoration Activities to

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Direct Forest Restoration Activities to
Start by deciding how you want to interact with the map.

Can't decide?
Draw or Upload?

- Draw treatments
- Upload treatments
Select which areas you wish to change treatment prescriptions for.

Assign Prescriptions

Click to select one or more treatment areas then apply your desired prescription.

0 treatments selected.

- No Treatment
- Maximum Biomass 16-inch
- Maximum Biomass 25-inch
- Burn Only
- Ideal Water Flow

Save And Report
Assign Prescriptions

Click to select one or more treatment areas then apply your desired prescription.

1 treatments selected.

- No Treatment
- Maximum Biomass 16-inch
- Maximum Biomass 25-inch
- Burn Only
Select which areas you wish to change treatment prescriptions for.

Assign Prescriptions

Click to select one or more treatment areas then apply your desired prescription.

0 treatments selected.

Select All Clear Selection

Apply No Treatment

Apply Maximum Biomass 16-inch

Apply Maximum Biomass 25-inch

Apply Burn Only
Summary Report

Basin Characteristics
- Total area upslope of this gauging station: 6146.27 acres
- Forested area upslope: 4375 acres
- Baseline water yield: 0.21 inches/year
- Baseline average annual flow: 0.15 CFS
- Baseline September mean flow: 0.08 CFS
- Baseline September median 7 day avg low flow: 0.08 CFS

Hydrologic Characteristics
- Change in average annual flow from proposed management
Hydrologic Characteristics

Change in average annual flow from proposed management
- dry: +0.01 CFS
- normal: +0.04 CFS
- wet: +0.06 CFS

Change in average September flow from proposed management
- dry: +0.01 CFS
- normal: +0.02 CFS
- wet: +0.04 CFS

Change in Sept. 7-day low flow from proposed management
- dry: +0.01 CFS
- normal: +0.02 CFS
Absolute Flow Rate

- Normal: 0.1010
- Wet: 0.1642
- Dry: 0.0115
- Treated: 0.0782

Note: The graph shows flow rate fluctuations over time.