# Flood Retention Facility Project Update

Chehalis River Basin Flood Control Zone District

August 4, 2022

# SEPA Resources of Significant Concern

- ✓ Air Quality and Greenhouse Gases
- ✓ Environmental Health and Safety
- ✓ Recreation
- ✓ Public Services and Utilities
- ✓ Wetlands – Airport Levee
- ✓ Land Use

- **Wetlands**
- **Fish Species and Habitats**
  - ✓ Fish Passage
- **Water**
- **Wildlife Species and Habitats**

# SEPA/NEPA Draft

- **Wetlands, Fish Species, and Habitats**

**FRE Habitat + Wetlands Mitigation Plans**

**Commitments**

No net loss of habitat and function

Create ecological lift – improve habitat function over existing condition

# Our Mitigation Team

- Dr. MaryLouise Keefe – Mitigation Program Manager
  - BA Smith College, Ph.D. University of Rhode Island
  - 8 years ODFW Fish Research, 23 Consulting Fish Ecologist
  - 31 years experience leading complex salmon habitat, fish passage projects in PNW and Alaska
- Mr. Shane Cherry – Wetland Mitigation Expert
  - BS MIT, MS John Hopkins
  - 26 years fluvial geomorphology, sediment transport, hydrology, and hydraulics.
- Dr. Paul DeVries – Civil and Environmental Engineer
  - BS Humboldt State, MS and Ph.D. Univ of Washington
  - 34 years of experience in stream restoration, geomorphology, hydrology & hydraulics
- Ms. Betsy McGregor – NEPA Expert
  - BS Indiana University
  - 30 years of experience in natural resource assessments

# FRE Mitigation Categories

- **1. Fish Habitat Access**
- **2. Aquatic Habitat Enhancements**
- **3. Riparian/Stream Buffer Expansion**
- **4. Wildlife Habitat Conservation**
- **5. Large Woody Material**
- 6. Water Quality Management Plan

# Mitigation + Lift

- Mitigation – fixing the worst case impacts
- Existing habitat conditions
- Ecological Lift

# Aquatic Habitat Access

| Mitigation Category | Impacts Addressed | Mitigation Quantity Proposed * |
|---|---|---|
| **Aquatic Habitat Access** | **Degradation and loss of function - 17 miles of stream channel** | **Open access to 42.5 stream miles** |

* mitigation = 2 ½ x impact

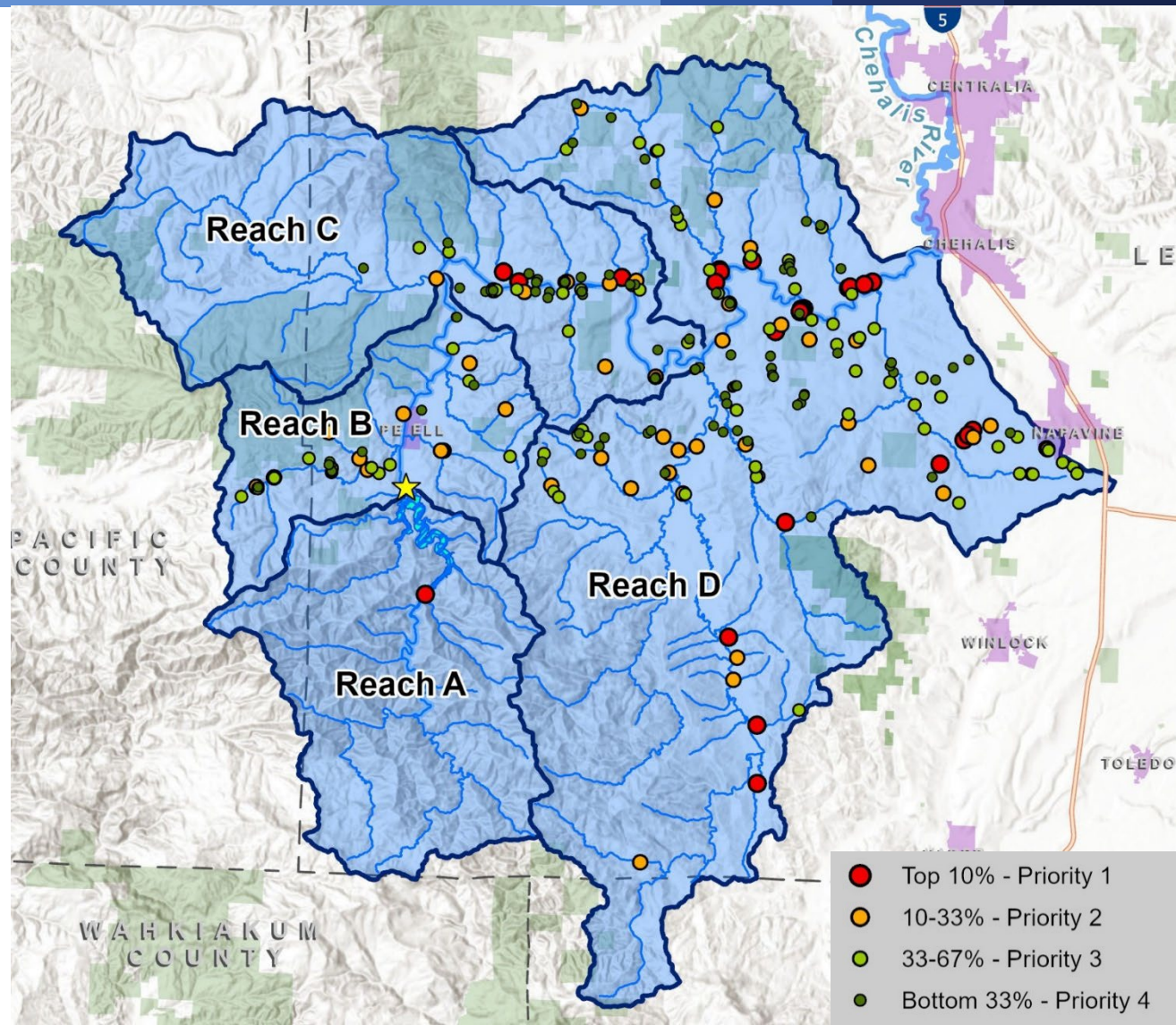
# Aquatic Habitat Access – Upper Basin

Objective:

- 42.5 miles of increased habitat connectivity

Upper Basin Opportunities:

- 228 fish passage barriers
- 375 miles of potential habitat gain for salmon



# Aquatic Habitat Access

**Ecological lift** from increased habitat quantity and quality.

Also, selected tributaries for access projects would either:

1) have cool water, or
2) we would co-locate with riparian/stream buffer enhancement projects.

# Culvert Replacement

Before

After

# Aquatic Habitat Restoration

| Mitigation Category | DEIS Impacts Addressed | Mitigation Quantity * |
|---|---|---|
| Aquatic Habitat | - Degradation and loss of function – 17 miles of stream channel<br>- Water temperature increase downstream, up to 5.4°F (1.8°C) – no VMP<br>- Changes riverbed substrate<br>- Changes to woody material transport<br>- Potential effects on fish habitat<br>- Reduced groundwater recharge | 56 actions at 49 sites |

*Exact number and locations dependent upon landowner agreements

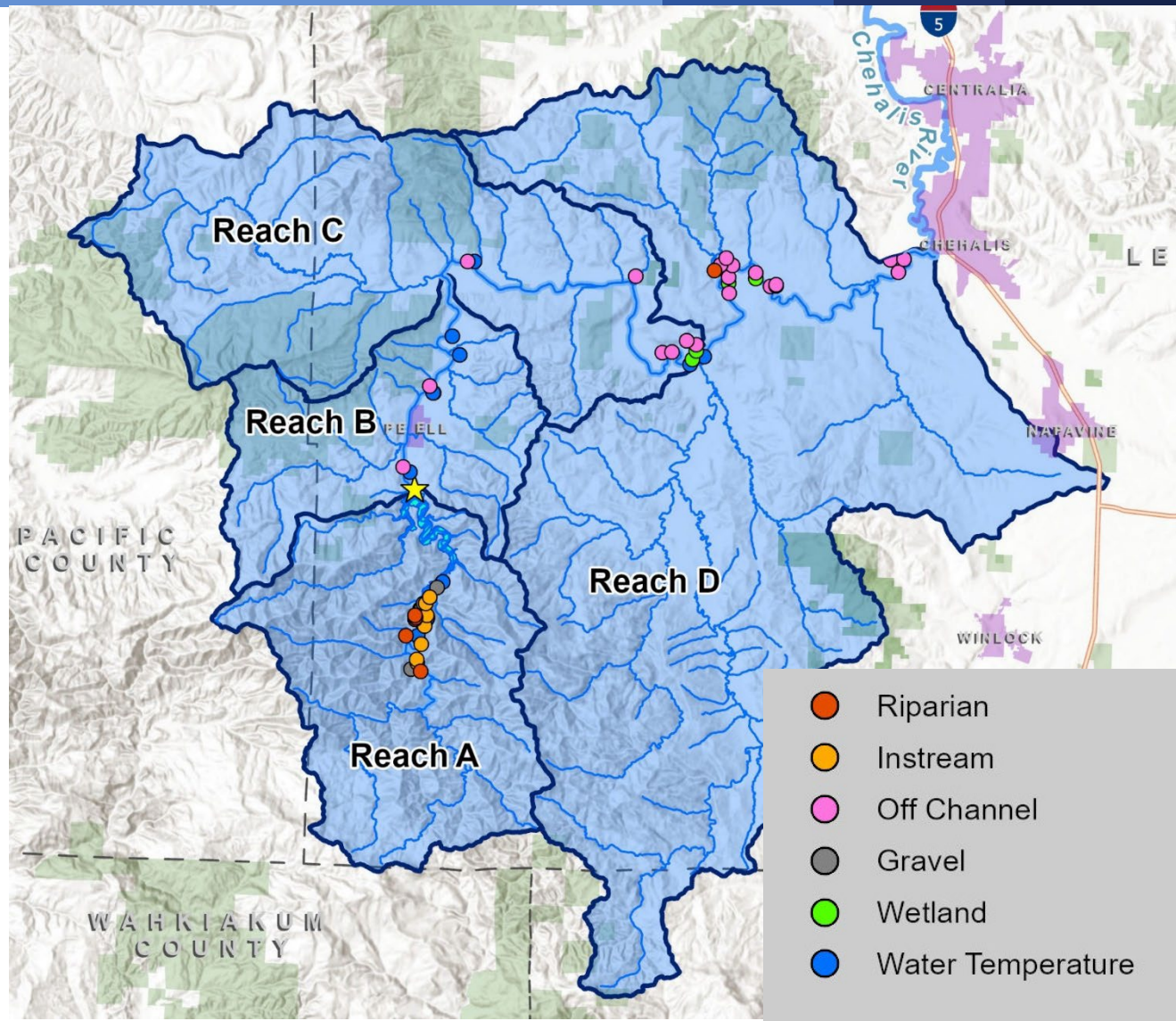
# Aquatic Habitat Enhancements

Objectives:

- Improve fish spawning and rearing habitat
- Add complexity and diversity to channel
- Engage floodplain
- Provide thermal refuge

Opportunities:

- Water temperature improvements
- Instream structure
- Reconnect off-channel features
- Gravel retention jams



# Aquatic Habitat Restoration Lift

Uniform
& degraded
river channel



Complex natural channel

# Aquatic Habitat Restoration Lift

**Ecological Lift** from:

1) improve lower quality habitats, and

2) co-locating actions in a reach = complex habitat

# Riparian/Stream Buffer Expansion

| Mitigation Category | Impacts Addressed | Mitigation Quantity Proposed |
|---|---|---|
| Riparian/Stream Buffer Expansion | - Degradation and loss of function – 17 miles of stream channel<br>- Water temperature increase downstream, up to 5.4°F (1.8°C) – no VMP<br>- Loss of 333 acres of wetland buffers = reduced wildlife habitat<br>- Changes to woody material transport<br>- Potential effects on fish habitat | Covering 25.5 miles downstream of FRE |

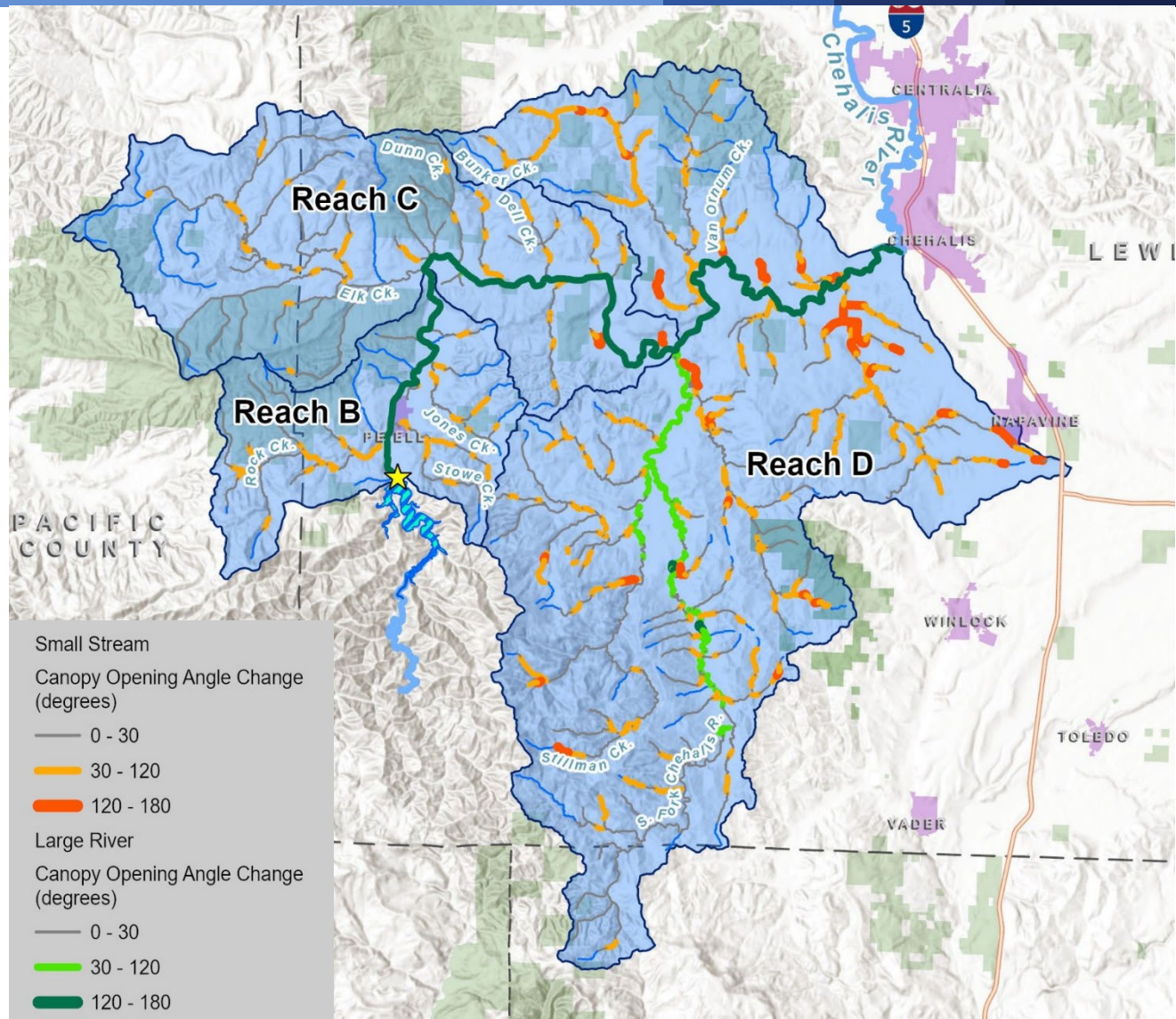
# Riparian/Stream Buffer Expansion

Objective:

- Enhance riparian habitat along 25.5 miles downstream of the FRE location

Opportunities:

- 147.5 miles of stream with >30$^{o}$ canopy opening change



# Riparian/Stream Buffer Expansion

- (In addition to VMP)
- Increase streamside shade to offset tree loss thermal and water quality impacts from temporary reservoir.
- **Ecological lift** will be attained by:
  - Remove invasive species including Himalayan blackberry and reed canarygrass replaced with native shrubs and trees,
  - Bank stability
  - Native species habitat
  - Long term wood recruitment

# Wildlife Habitat Conservation

| Mitigation Category | Impacts Addressed | Mitigation Quantity Proposed |
|---|---|---|
| Wildlife Habitat Conservation | - Removal of 90% of tree cover in the 600-acre temporary reservoir area during construction -no VMP<br>- Tree removal on 847 acres from periodic inundation – no VMP<br>- Inundation of up to 847 acres in the temporary reservoir area<br>- Decreased habitat functions<br>- Increased water temperatures<br>- Invasive species colonization<br>- Noise during construction<br>- Mortality of species unable to move during inundation<br>- Mortality of species due to loss of habitat<br>- Decreased distribution of native species<br>- Increased habitat for invasive species | 500 acres OR<br>20.6 miles of 200' wide buffers |

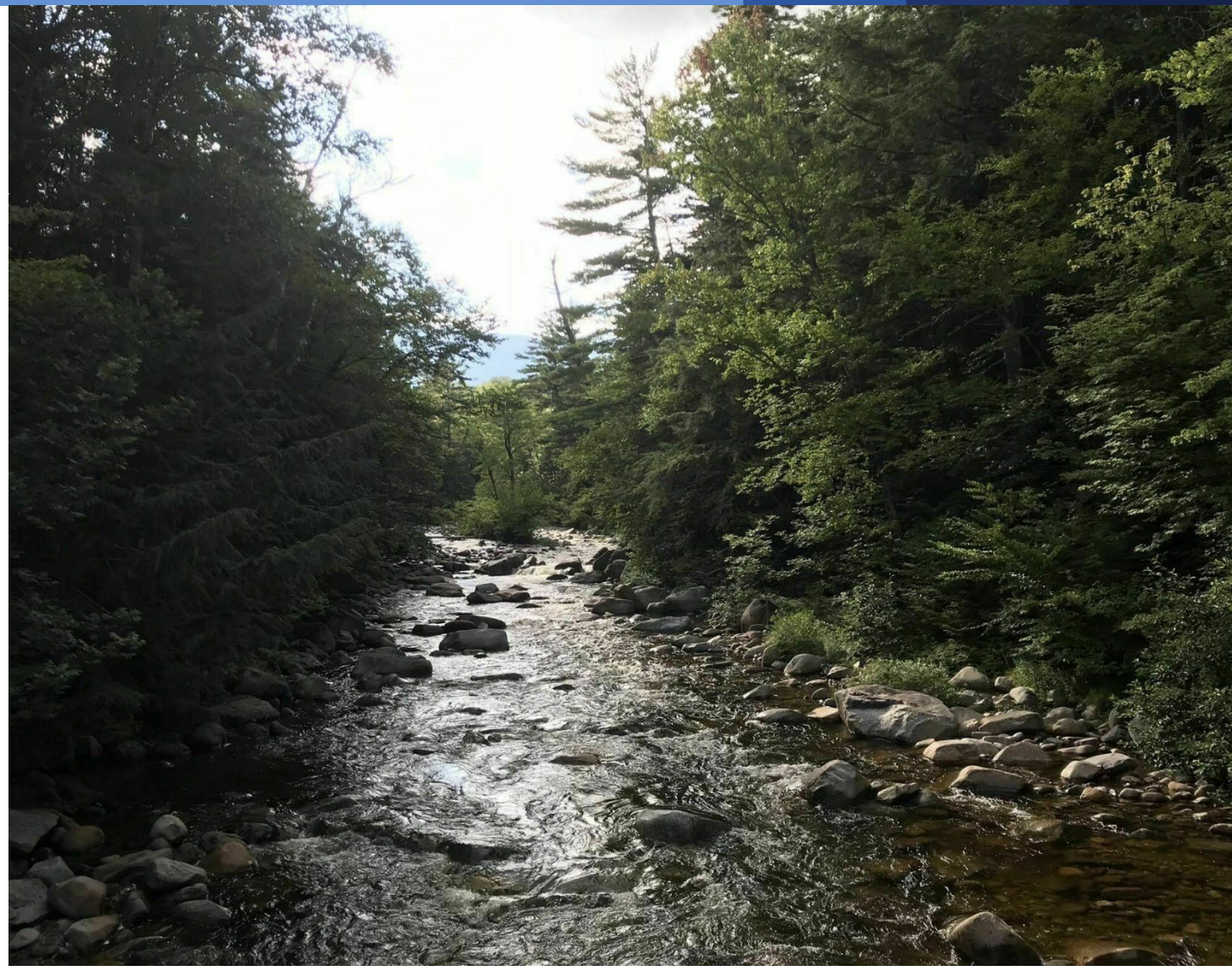
# Wildlife Habitat Conservation

Objectives:

- 500 acres forest into conservation
- 20.6 miles 100-ft stream buffer
- Revegetation and native species management
- Includes wetlands and buffers

Opportunities:

- Upper watershed under current managed forest practices
- Approximately 100 miles of habitat identified – tributary and mainstem
- Addresses potential climate affects



# Large Woody Material

| Mitigation Category | Impacts Addressed | Mitigation Quantity Proposed |
|---|---|---|
| Large Woody Material | - Changes to transport woody material<br>- Unquantified potential effects on fish habitat | Instream placement sites across 46.1 miles, future recruitment |

# Large Woody Material

Objectives:

- With VMP, more mature trees will be available for recruitment as aquatic habitat

- Improve the aquatic habitat through the wood placements leading to increased habitat complexity + deeper cool water pockets

Opportunities:

- Sites for instream wood structures, riparian enhancements, and forest conservation identified

# Large Woody Material

**Ecological lift** from added wood in depleted reaches

**Ecological lift** from co-locating riparian buffer revegetation and flood fencing

Flood fencing captures sediment and wood to promote natural reforestation.

# Wetland Mitigation Sites

Mitigation plan: more than 2x the wetland acreages after mitigation vs. today.

# Monitoring and Adaptive Management

- Monitoring plan to continually test effectiveness

- Adaptive management ensures long term function maintained in face of uncertainties

# Questions

# Wetland Mitigation Plan

| IMPACT TYPE | PORTION OF IMPACT (ACRES) | PROPOSED MITIGATION TYPE | MITIGATION RATIO | PROPOSED MITIGATION QUANTITY (ACRES) |
|---|---|---|---|---|
| **Category II Wetland** | 0.5 | Preservation | 12:1 | **6** |
| | 1.0 | Enhancement | 12:1 | **12** |
| | 7.6 | Restoration/Creation | 3:1 | **22.8** |
| **Total** | 9.1 | | | |
| **Category III Wetland** | 0.7 | Preservation | 8:1 | **5.6** |
| | 1.3 | Enhancement | 8:1 | **10.4** |
| | 6.4 | Restoration/Creation | 2:1 | **12.8** |
| **Total** | **8.4** | | | |
| **Buffer** | 377.5 | Establish Wetland Buffer | 1:1 | **377.5** |