Chehalis Basin Strategy Flood Retention Facility
Pre-Construction Vegetation Management Plan

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Purpose and Objectives

• Purpose and Objectives of Pre-Construction Vegetation Management
  o Reduce potential for future damage to dam facilities
  o Reduce the amount of woody material that would accumulate in the reservoir during a flood
  o Remove vegetation that could pose a hazard to dam operations personnel
  o Maintain some level of riparian zone function
  o Minimize the potential for erosion along slopes of reservoir area
  o Harvest marketable timber in areas where projected inundation would kill tree species that do not tolerate extended flooding
Regional Case Studies

• Mud Mountain/Howard E. Hanson Dams
  o Both sites were likely cleared prior to dam construction (1939 to 1948 [Mud Mountain] and 1959 to 1962 [Howard E. Hanson])
  o Neither facility currently includes vegetation management activities in their operating plans
  o No major tree removal actions have been required
  o Vegetation does not have to be removed from the entire reservoir area
FRO/FRFA Inundation Zones

- Projected Inundation Zones Used for Vegetation Management
  - Flooded every year, will be under water on average greater than 76 days/year (FRFA only)
  - 10% chance of being flooded in a year (10-year event), will be under water for 25 days/year when flooded (FRO and FRFA)
  - 5% chance of being flooded in a year (20-year event), will be under water for 4 days/year when flooded (FRO and FRFA)
  - 1% chance of being flooded in a year (100-year event), will be under water for 1 day/year when flooded (FRO and FRFA)
  - <1% chance of being flooded in a year (>100-year event) (FRO and FRFA)
Management Approach

• Proposed Vegetation Management Plan
  o Woody vegetation would be cleared from the dam site and temporary construction areas
  o Within the reservoir footprint, clearing would be much more limited
    • For the zones where inundation duration is expected to last 25 days or more, all non-flood tolerant species (e.g., Douglas fir) would be removed
    • No clearing would occur in the upper zones
### Expected Vegetation Community Types – FRO

<table>
<thead>
<tr>
<th>INUNDATION ZONE</th>
<th>ELEVATION RANGE (FEET)(^1)</th>
<th>PRE-CONSTRUCTION MANAGEMENT ACTIONS(^2)</th>
<th>AREA (ACRES)(^3)</th>
<th>EXPECTED POST-CONSTRUCTION VEGETATION COMMUNITY TYPE AND TYPICAL VEGETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>10% chance of being flooded in a year (10-year event), will be under water for 25 days when flooded</td>
<td>424 – 567</td>
<td>Selectively harvested to remove non-flood tolerant species</td>
<td>514</td>
<td>Deciduous Riparian Shrubland – various willows, red-osier dogwood, potential emergent/scrub-shrub wetlands</td>
</tr>
<tr>
<td>5% chance of being flooded in a year (20-year event), will be under water for 4 days when flooded</td>
<td>567 – 584</td>
<td>No harvest</td>
<td>86</td>
<td>Deciduous Riparian Forest with Some Conifers – red alder, western red cedar, Oregon ash, black cottonwood, willows, elderberry, snowberry</td>
</tr>
<tr>
<td>1% chance of being flooded in a year (100-year event), will be under water for 1 day when flooded</td>
<td>584 – 612</td>
<td>No harvest</td>
<td>154</td>
<td>Mixed Coniferous/Deciduous Transitional Forest – Douglas fir (young), red alder, bigleaf maple</td>
</tr>
<tr>
<td>&lt;1% chance of being flooded in a year (&gt;100-year event)</td>
<td>612 – 627</td>
<td>No harvest</td>
<td>101</td>
<td>Coniferous Forest – Douglas fir</td>
</tr>
</tbody>
</table>

Notes:
2. These management actions may be either periodically repeated on a regular management cycle (e.g., every 20 years) or as needed.
3. Note that vegetated area extents are only those areas that are currently vegetated and do not include roads or non-vegetated land (e.g., stream channels).
Mud Mountain Dam Reservoir Area
Post-Construction Vegetation Community Types

Deciduous Riparian Shrubland – various willows, red-osier dogwood, potential emergent/scrub-shrub wetlands

Deciduous Riparian Forest with some conifers – red alder, western red cedar, Oregon ash, black cottonwood, willows, elderberry, snowberry

Mixed Coniferous/Deciduous Transitional Forest – Douglas fir (young), red alder, bigleaf maple
Expected Vegetation Community Type Areas – FRO

- **Deciduous Riparian Shrubland** – various willows, red-osier dogwood, potential emergent/scrub-shrub wetlands
- **Deciduous Riparian Forest with some conifers** – red alder, western red cedar, Oregon ash, black cottonwood, willows, elderberry, snowberry
- **Mixed Coniferous/Deciduous Transitional Forest** – Douglas fir (young), red alder, bigleaf maple
- **Coniferous Forest** – Douglas fir
## Expected Vegetation Community Types – FRFA

<table>
<thead>
<tr>
<th>INUNDATION ZONE</th>
<th>ELEVATION RANGE (FEET)¹</th>
<th>PRE-CONSTRUCTION MANAGEMENT ACTIONS²</th>
<th>AREA (ACRES)³</th>
<th>EXPECTED POST-CONSTRUCTION VEGETATION COMMUNITY TYPE AND TYPICAL VEGETATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flooded every year, will be under water on average greater than 76 days/year when flooded</td>
<td>424 – 627</td>
<td>Clear-cut</td>
<td>855</td>
<td>Aquatic – largely unvegetated</td>
</tr>
<tr>
<td>10% chance of being flooded in a year (10-year event), will be under water for 25 days when flooded</td>
<td>627 – 653</td>
<td>Selectively harvested to remove non-flood tolerant species</td>
<td>202</td>
<td>Deciduous Riparian Shrubland – various willows, red-osier dogwood, potential emergent/scrub-shrub wetlands</td>
</tr>
<tr>
<td>5% chance of being flooded in a year (20-year event), will be under water for 4 days when flooded</td>
<td>653 – 661</td>
<td>No harvest</td>
<td>61</td>
<td>Deciduous Riparian Forest with some conifers – red alder, western red cedar, Oregon ash, black cottonwood, willows, elderberry, snowberry</td>
</tr>
<tr>
<td>1% chance of being flooded in a year (100-year event), will be under water for 1 day when flooded</td>
<td>661 – 678</td>
<td>No harvest</td>
<td>146</td>
<td>Mixed Coniferous/Deciduous Transitional Forest – Douglas fir (young), red alder, bigleaf maple</td>
</tr>
<tr>
<td>&lt;1% chance of being flooded in a year (&gt;100-year event)</td>
<td>678 – 687</td>
<td>No harvest</td>
<td>78</td>
<td>Coniferous Forest – Douglas fir</td>
</tr>
</tbody>
</table>

**Notes:**
2. These management actions may be either periodically repeated on a regular management cycle (e.g., every 20 years) or as needed.
3. Note that vegetated area extents are only those areas that are currently vegetated and do not include roads or non-vegetated land (e.g., stream channels).
Howard E. Hanson Dam Reservoir Area
Post-Construction Vegetation Community Types

- Aquatic – largely unvegetated
- Deciduous Riparian Shrubland
- Deciduous Riparian Forest with some conifers
- Mixed Coniferous/Deciduous Transitional Forest
**Expected Vegetation Community Type Areas – FRFA**

- **Aquatic** – largely unvegetated
- **Deciduous Riparian Shrubland** – various willows, red-osier dogwood, potential emergent/scrub-shrub wetlands
- **Deciduous Riparian Forest with some conifers** – red alder, western red cedar, Oregon ash, black cottonwood, willows, elderberry, snowberry
- **Mixed Coniferous/Deciduous Transitional Forest** – Douglas fir (young), red alder, bigleaf maple
- **Coniferous Forest** – Douglas fir
Post-Construction Adaptive Vegetation Management Plan

• Woody vegetation would be monitored to determine if additional harvesting or planting is needed
  o Harvesting would be based on an abundance of non-flood tolerant species dying
  o Supplemental planting would occur in areas where harvest occurs and would be focused on more flood tolerant species
Facility Operations Vegetation Management Plan

• Guidelines on what would trigger cutting, trimming, or removal of live vegetation after initial dam construction
• Post-construction re-vegetation efforts
• Post-construction vegetation monitoring
• Adaptive management approaches
Questions/Discussion