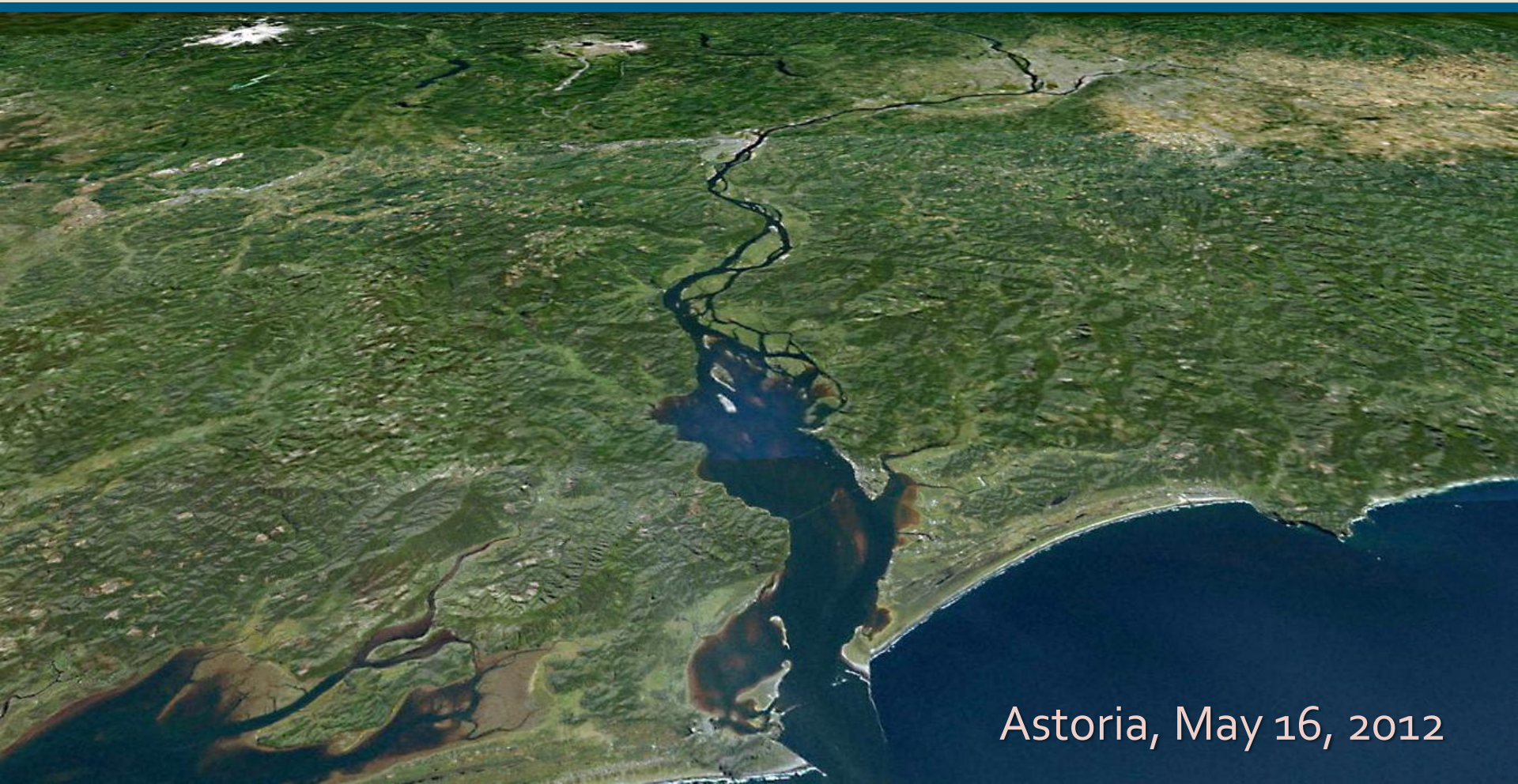
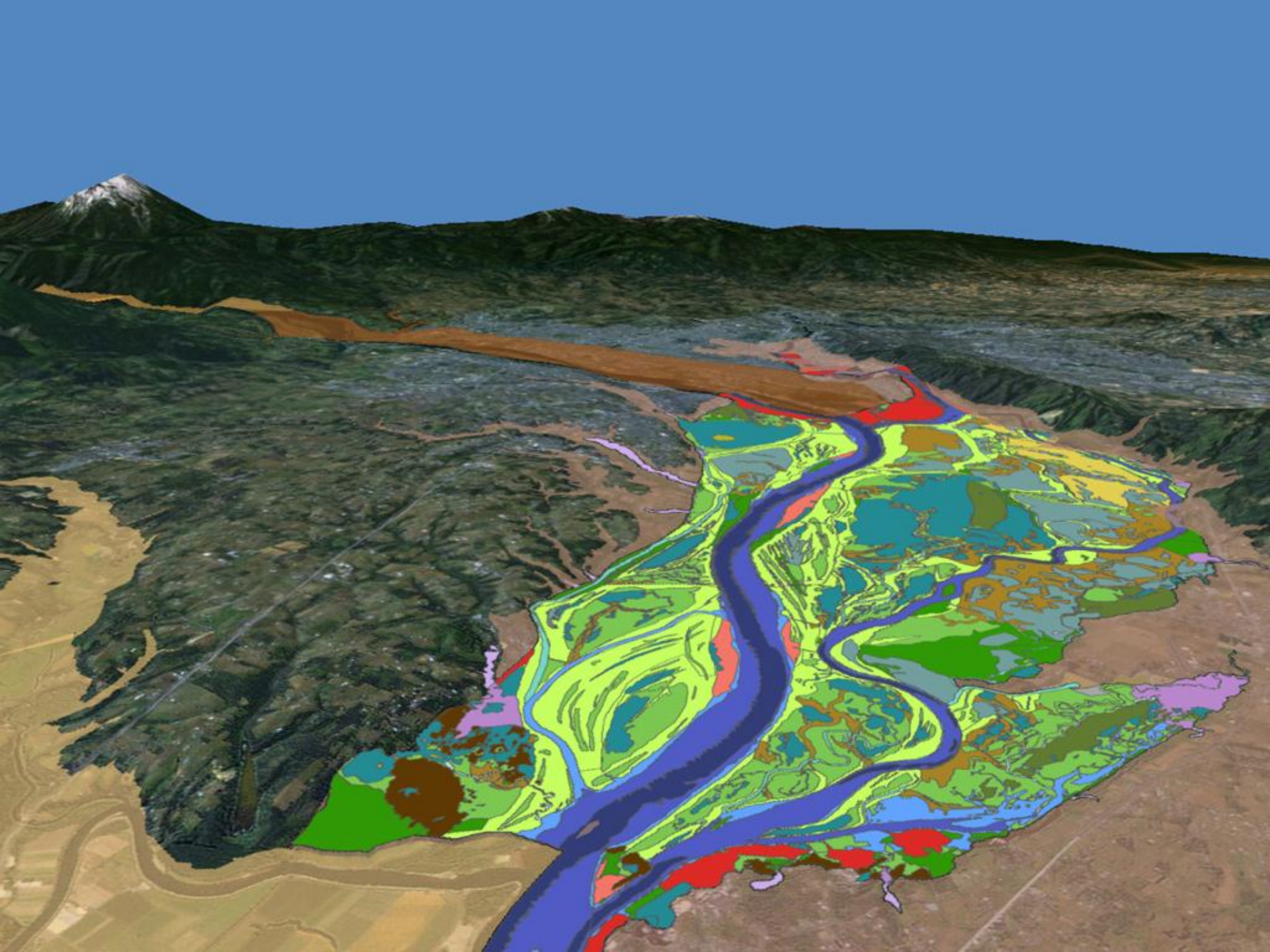
Integrated + Holistic Planning

using the

Landscape Planning Framework



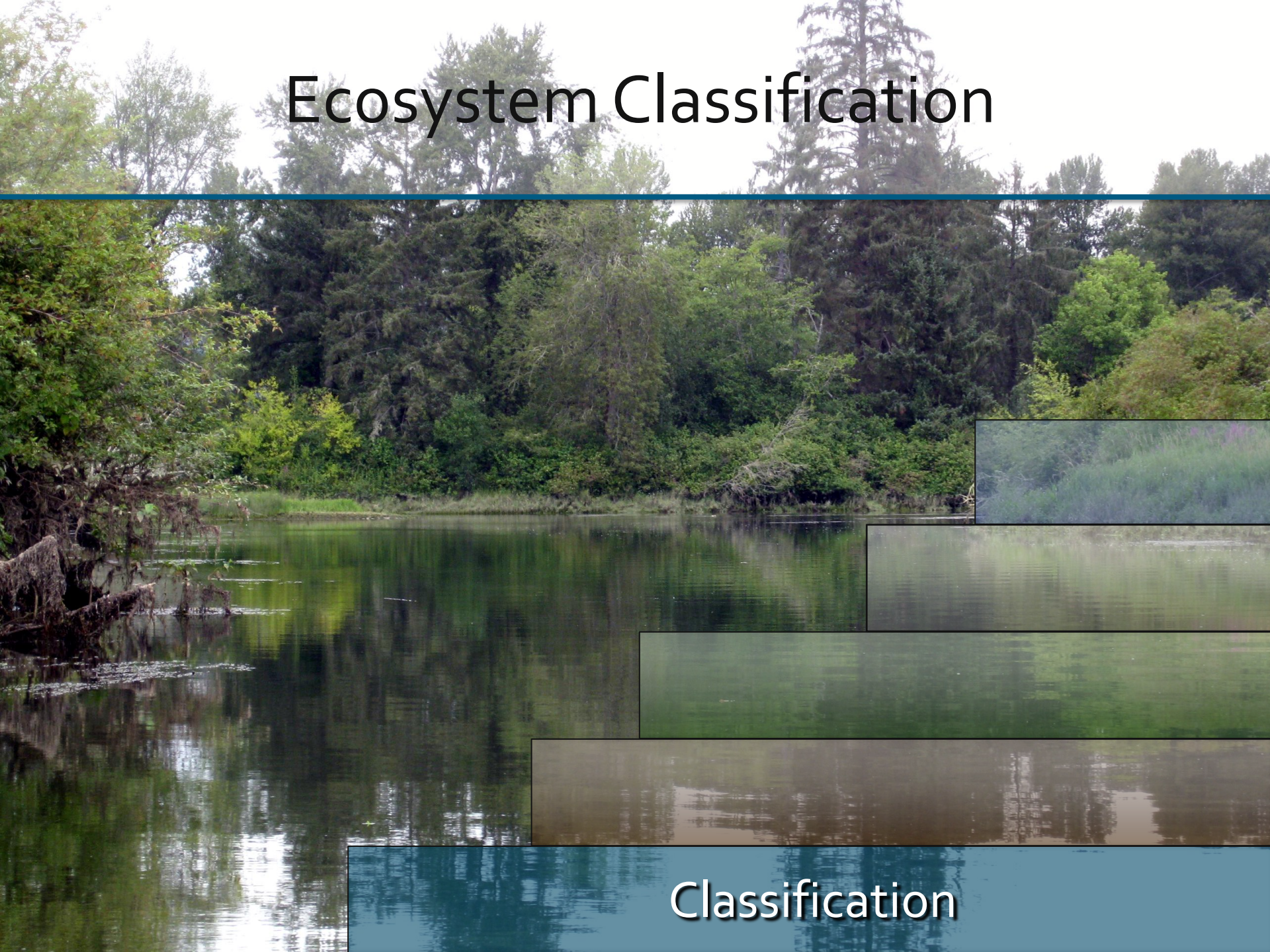
Astoria, May 16, 2012



Estuary Habitats Must Be …

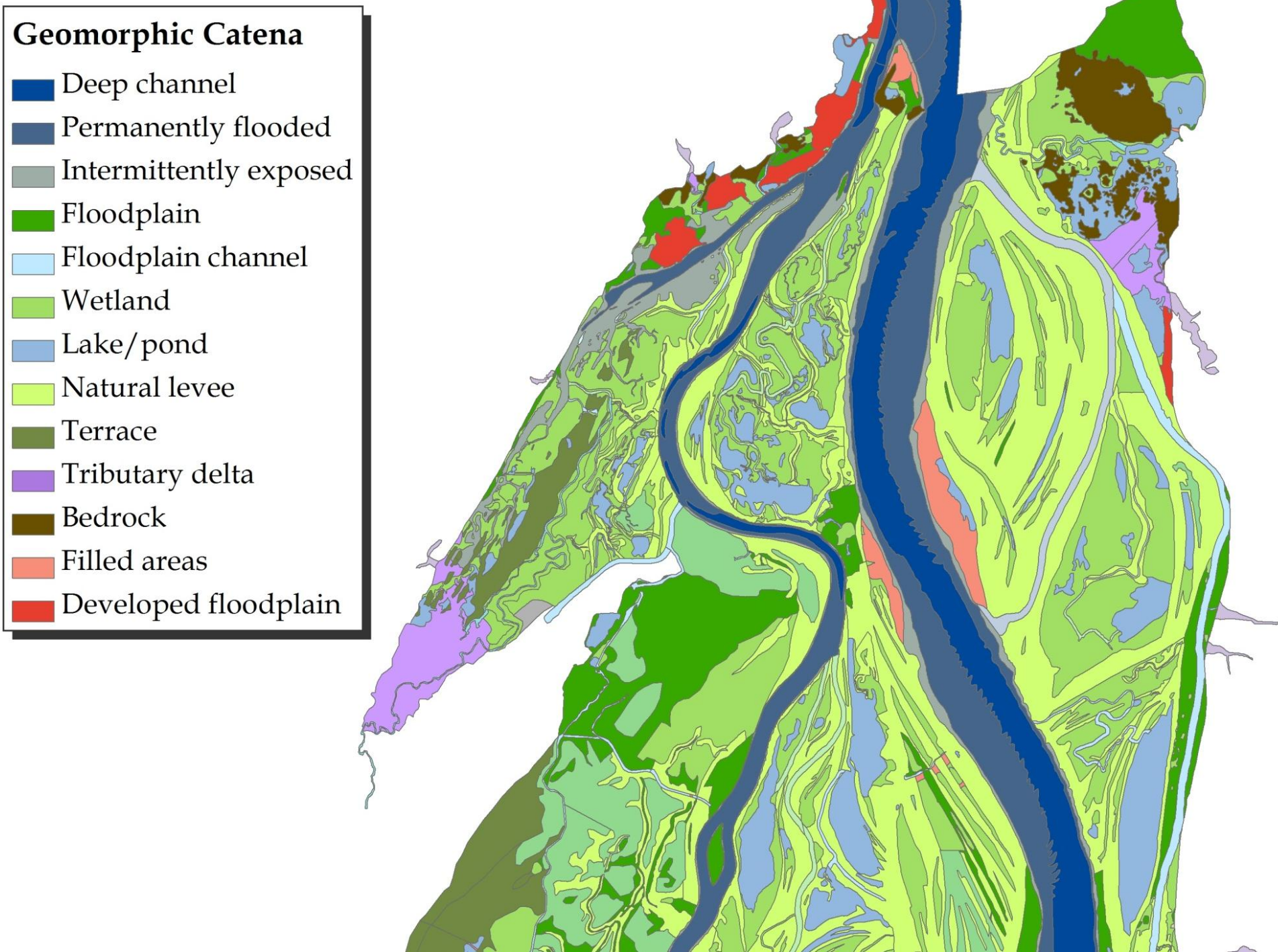
- Large enough
- Connected
- Suitable
- In enough places through time
- Maintained

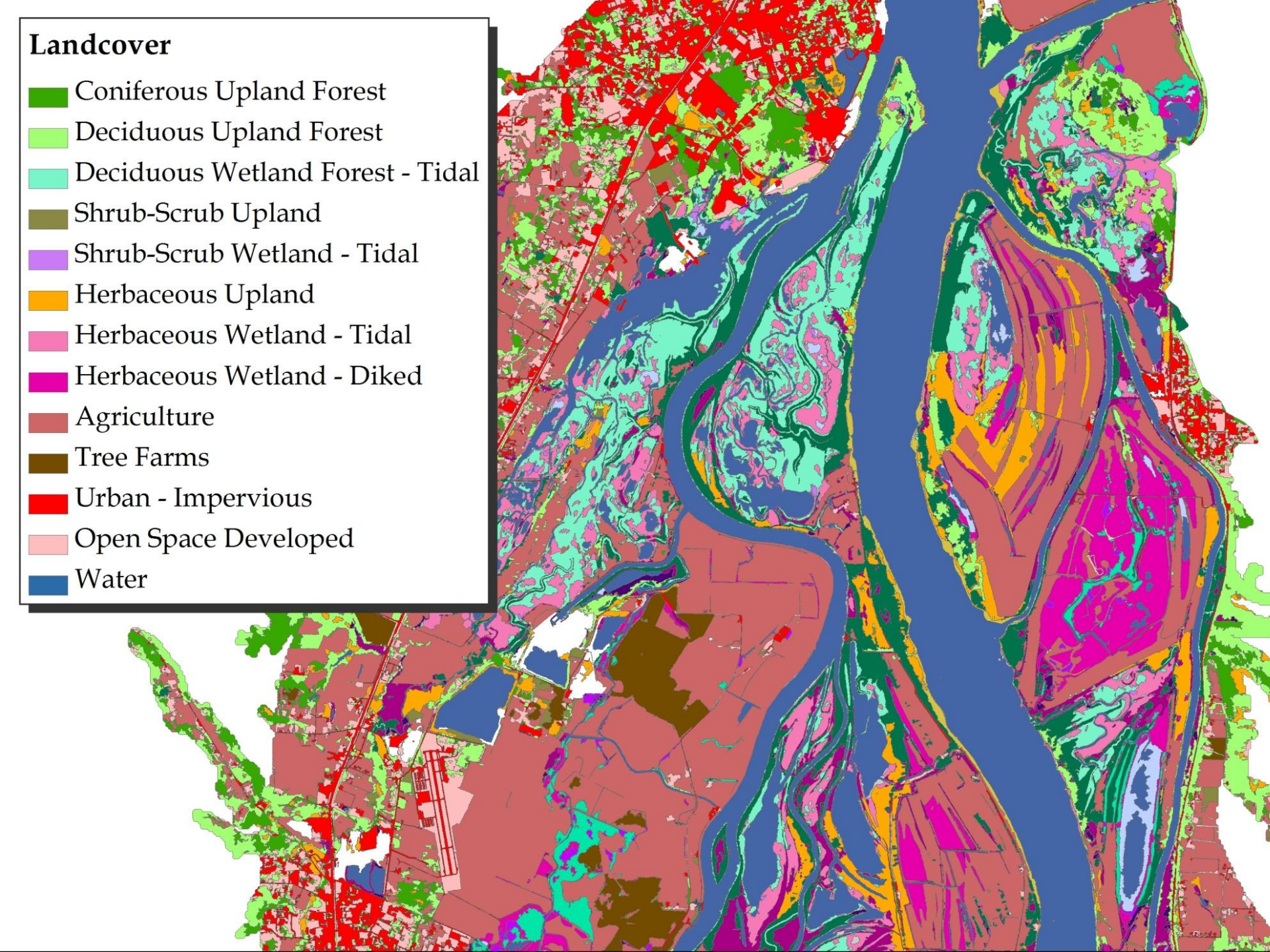
Ecosystem Classification

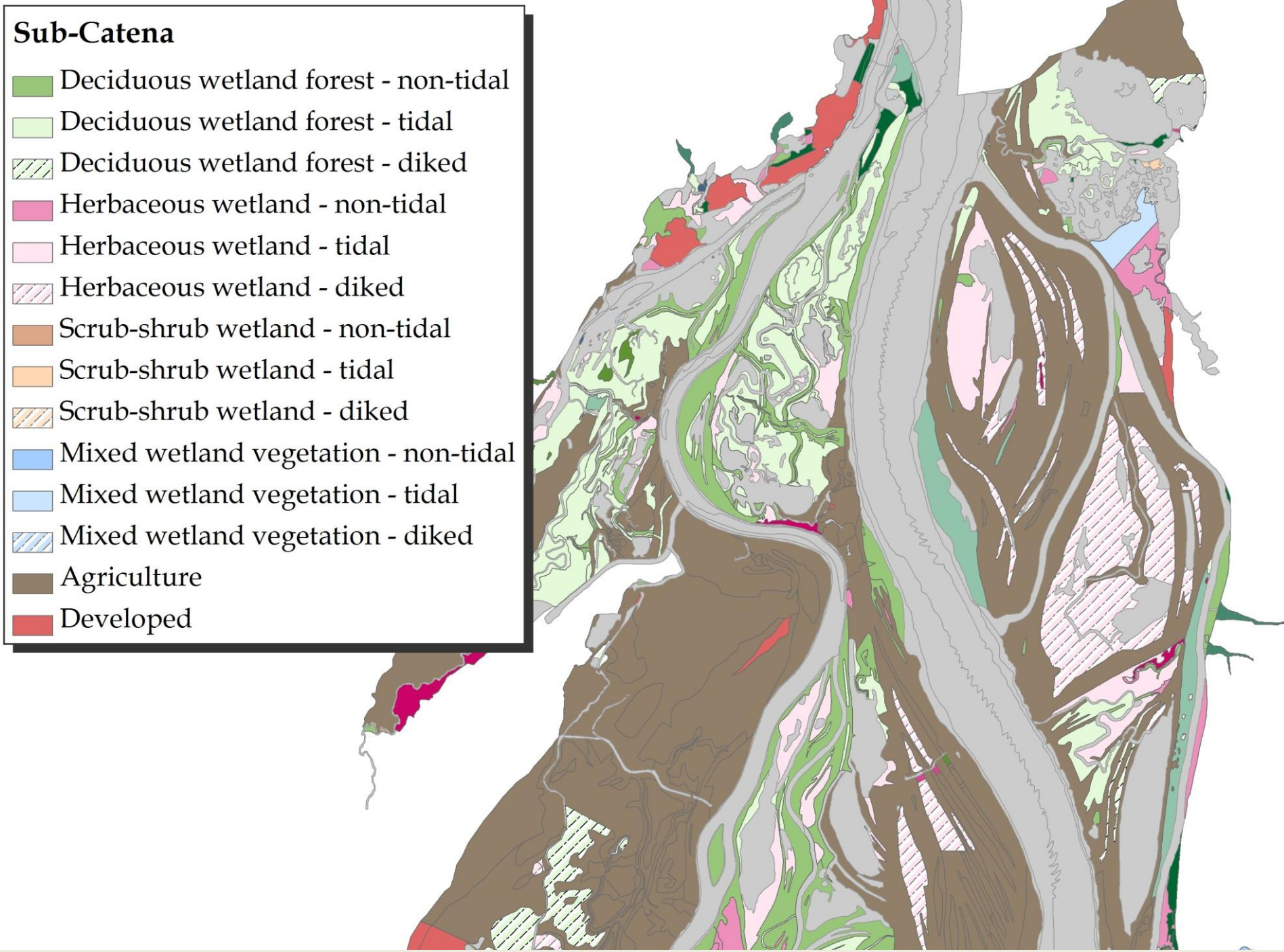


Classification Levels

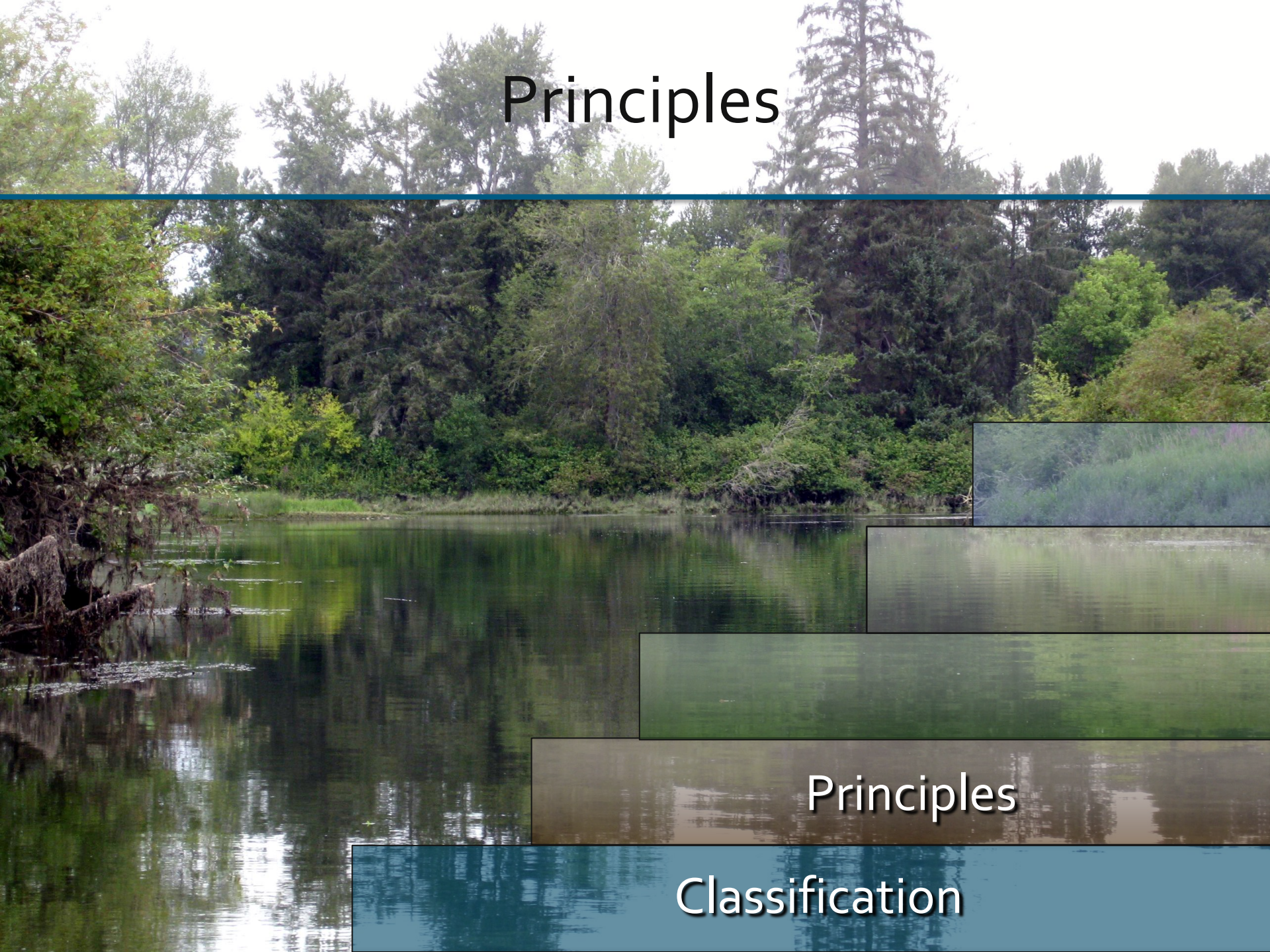
- Ecosystem province
- Ecoregion
- Hydrogeomorphic reach
- Ecosystem complex
- **Geomorphic catena**
- **Primary cover class**


Geomorphic Catena
Deep channel
Permanently flooded
Intermittently exposed
Floodplain
Floodplain channel
Wetland
Lake/pond
Natural levee
Terrace
Tributary delta
Bedrock
Filled areas
Developed floodplain


Landcover
Coniferous Upland Forest
Deciduous Upland Forest
Deciduous Wetland Forest - Tidal
Shrub-Scrub Upland
Shrub-Scrub Wetland - Tidal
Herbaceous Upland
Herbaceous Wetland - Tidal
Herbaceous Wetland - Diked
Agriculture
Tree Farms
Urban - Impervious
Open Space Developed
Water


Sub-Catena
Deciduous wetland forest - non-tidal
Deciduous wetland forest - tidal
Deciduous wetland forest - diked
Herbaceous wetland - non-tidal
Herbaceous wetland - tidal
Herbaceous wetland - diked
Scrub-shrub wetland - non-tidal
Scrub-shrub wetland - tidal
Scrub-shrub wetland - diked
Mixed wetland vegetation - non-tidal
Mixed wetland vegetation - tidal
Mixed wetland vegetation - diked
Agriculture
Developed

Principles

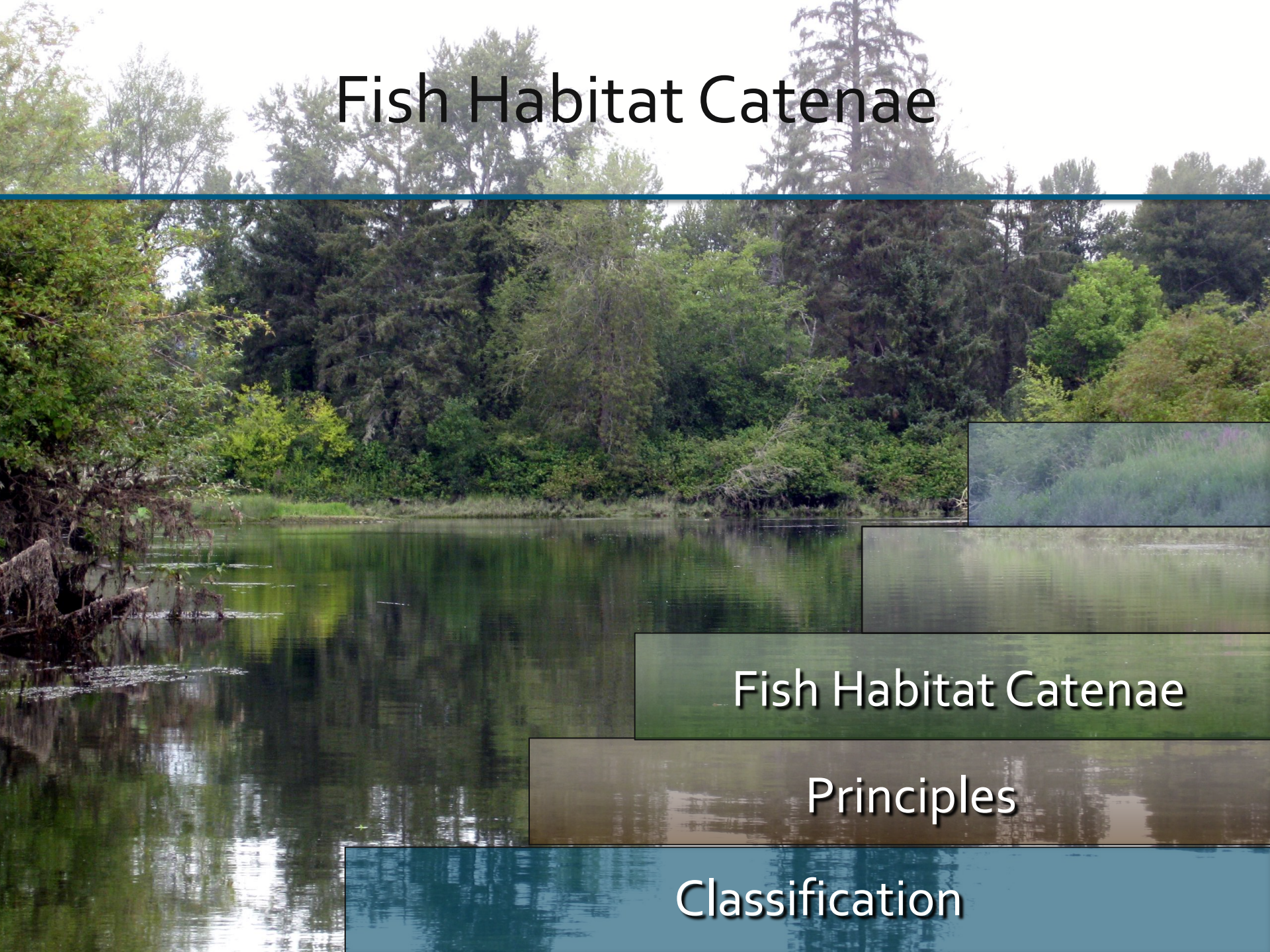


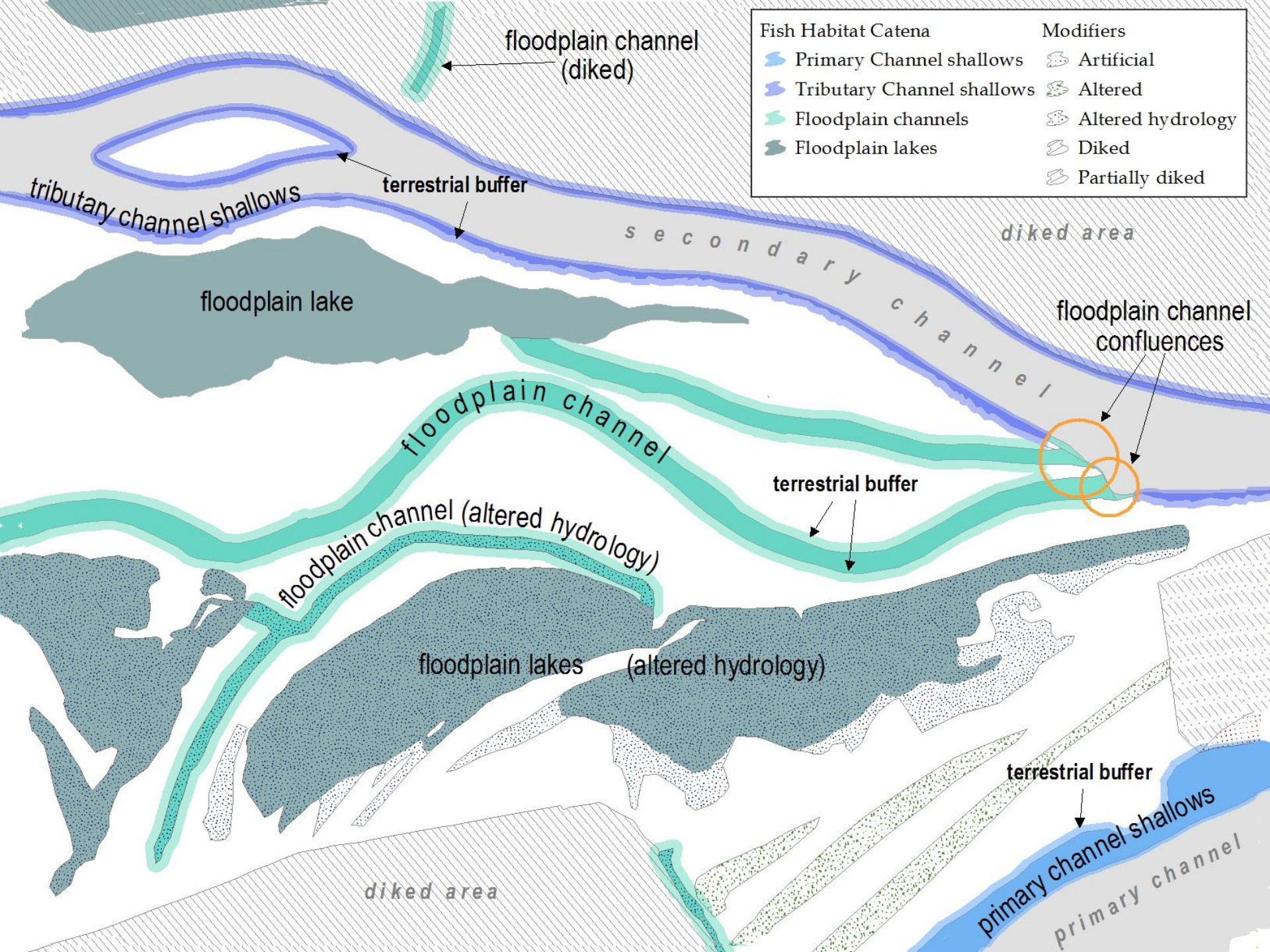
Principles

= **Our current understanding of estuarine juvenile salmonid habitat**

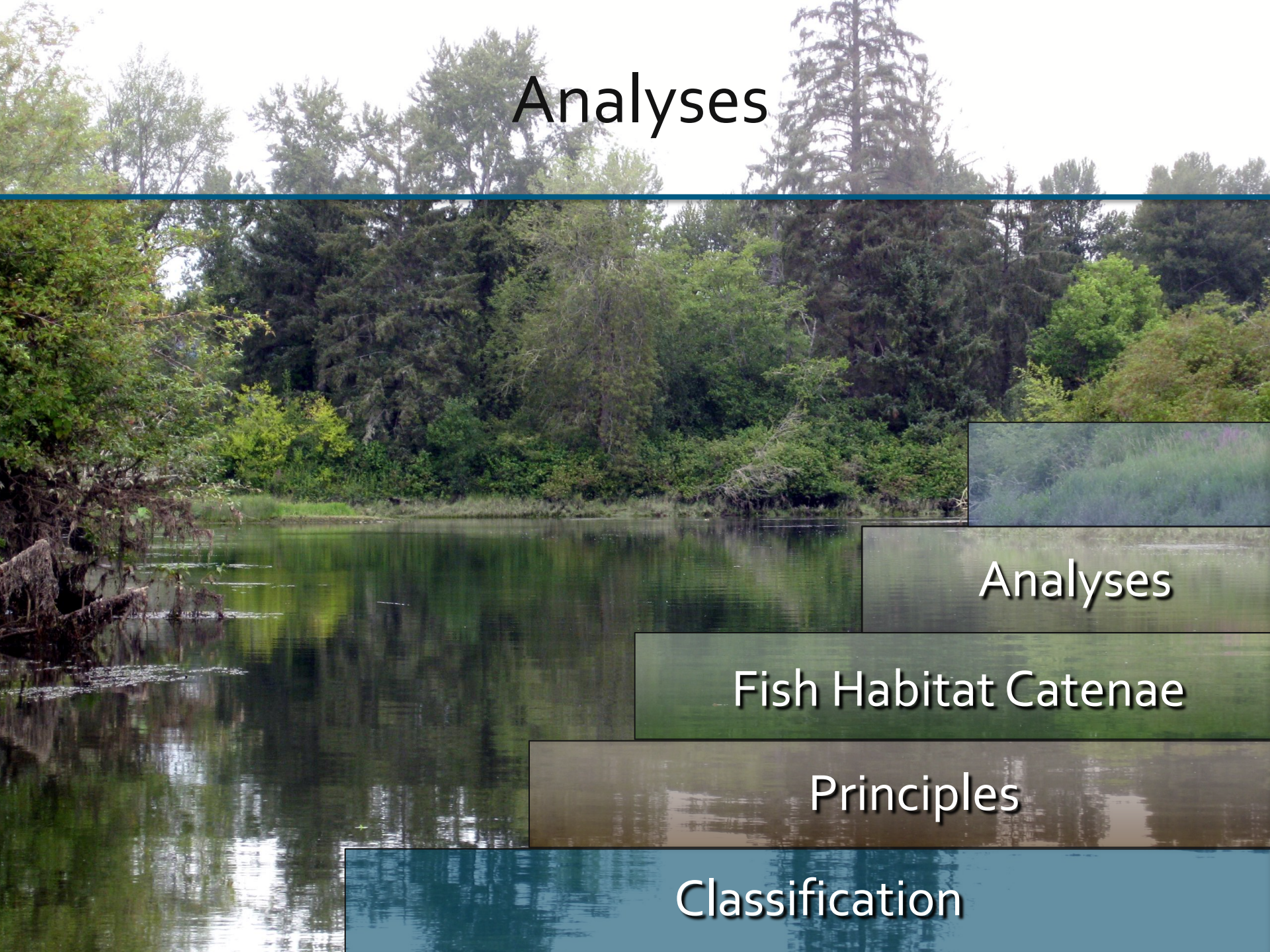
- Conserve/restore key salmon ecotones
- Maximize channel complexity
- Maximize foraging edge patch
- Increase floodplain inundation area and frequency

Fish Habitat Catenae




Fish Habitat Catena
Primary Channel shallows
Tributary Channel shallows
Floodplain channels
Floodplain lakes
Modifiers
Artificial
Altered
Altered hydrology
Diked
Partially diked
floodplain channel (diked)
tributary channel shallows
terrestrial buffer
secondary channel
diked area
floodplain lake
floodplain channel confluences
floodplain channel
floodplain channel (altered hydrology)
terrestrial buffer
floodplain lakes (altered hydrology)
terrestrial buffer
primary channel shallows
primary channel
diked area

Analyses


Analyses
Fish Habitat Catenae
Principles
Classification

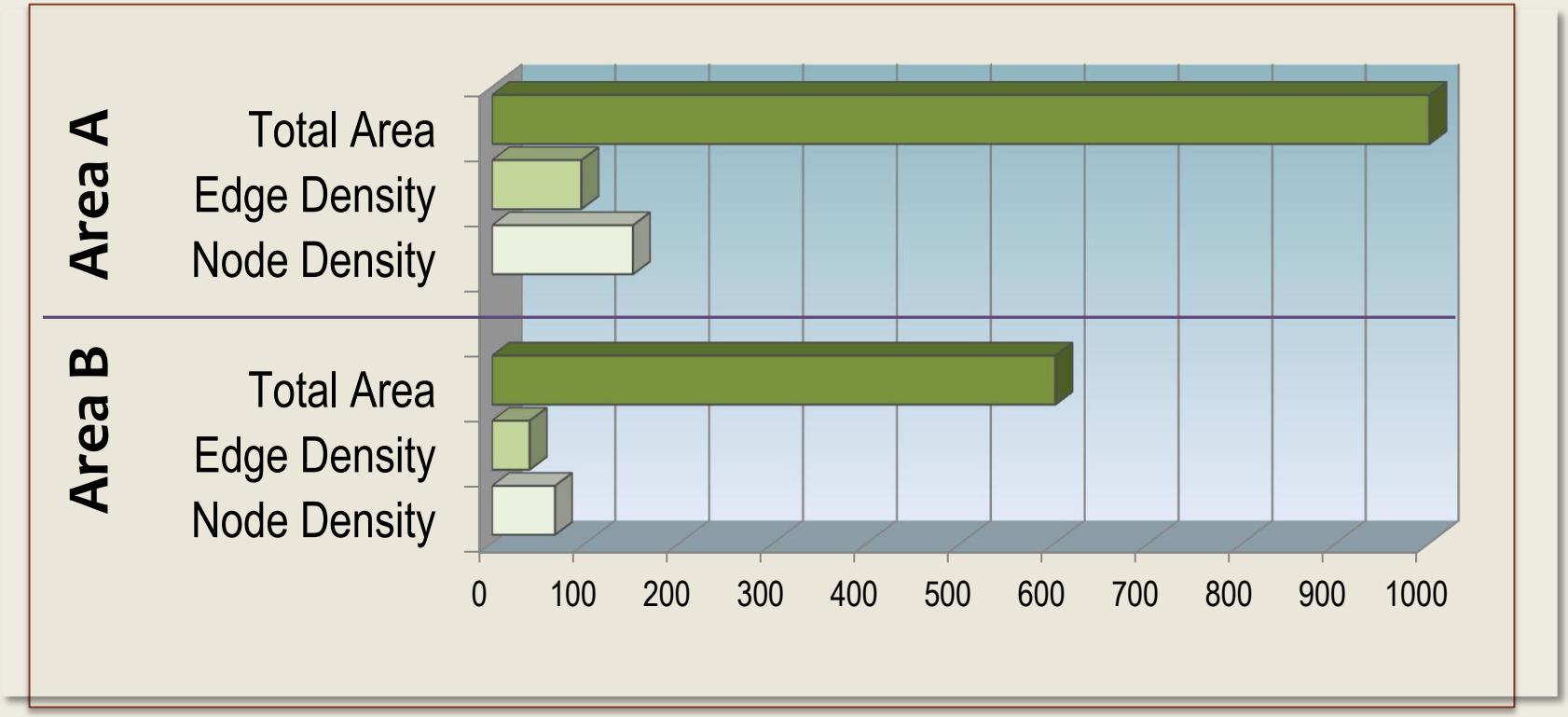
Metrics

= **Quantifiable habitat requirements**

- Total area ----------of fish habitat catena
- Channel edge density ----
  of perimeter/area
- Channel node density ----- in confluences/area

Applications: Evaluate Protection Sites

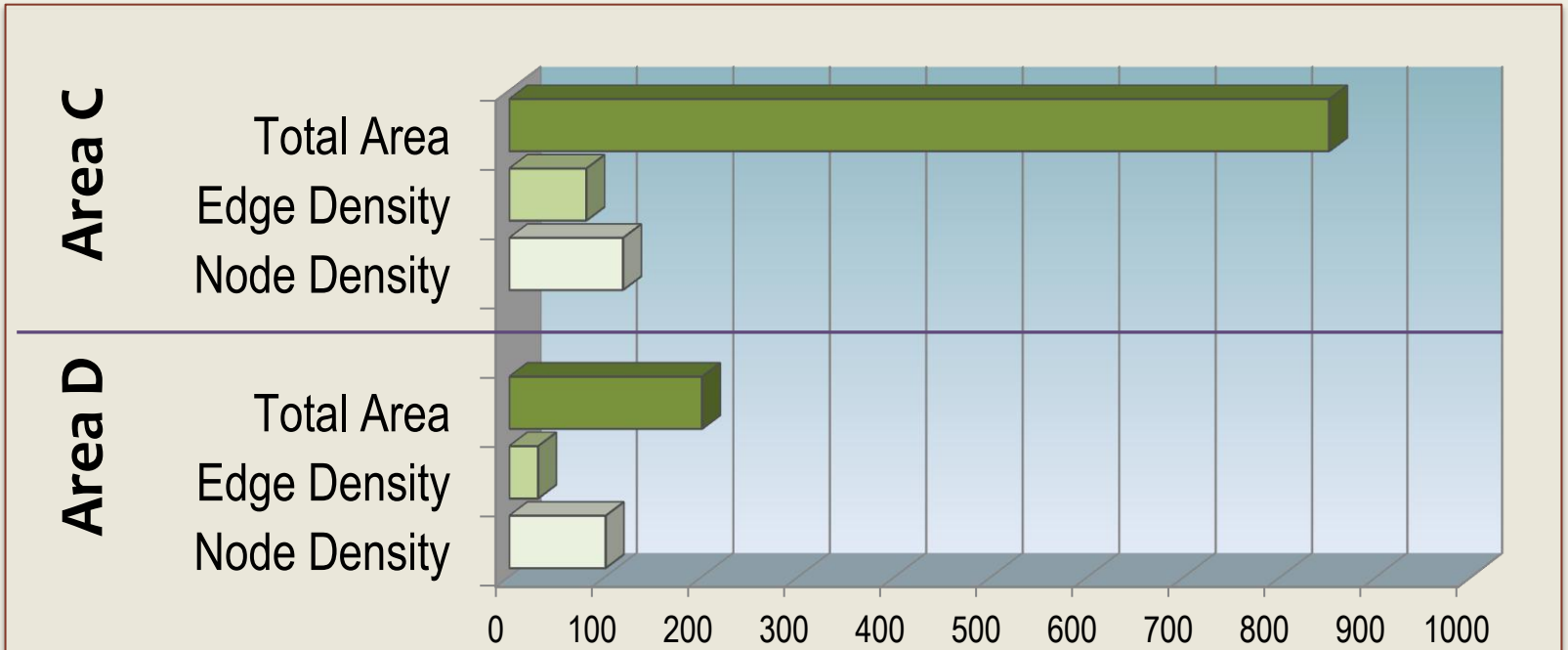
Protection Site Metrics



LEGEND
Total Area = acres
Edge Density = meters/hectares
Node Density = # nodes/acres x 10,000

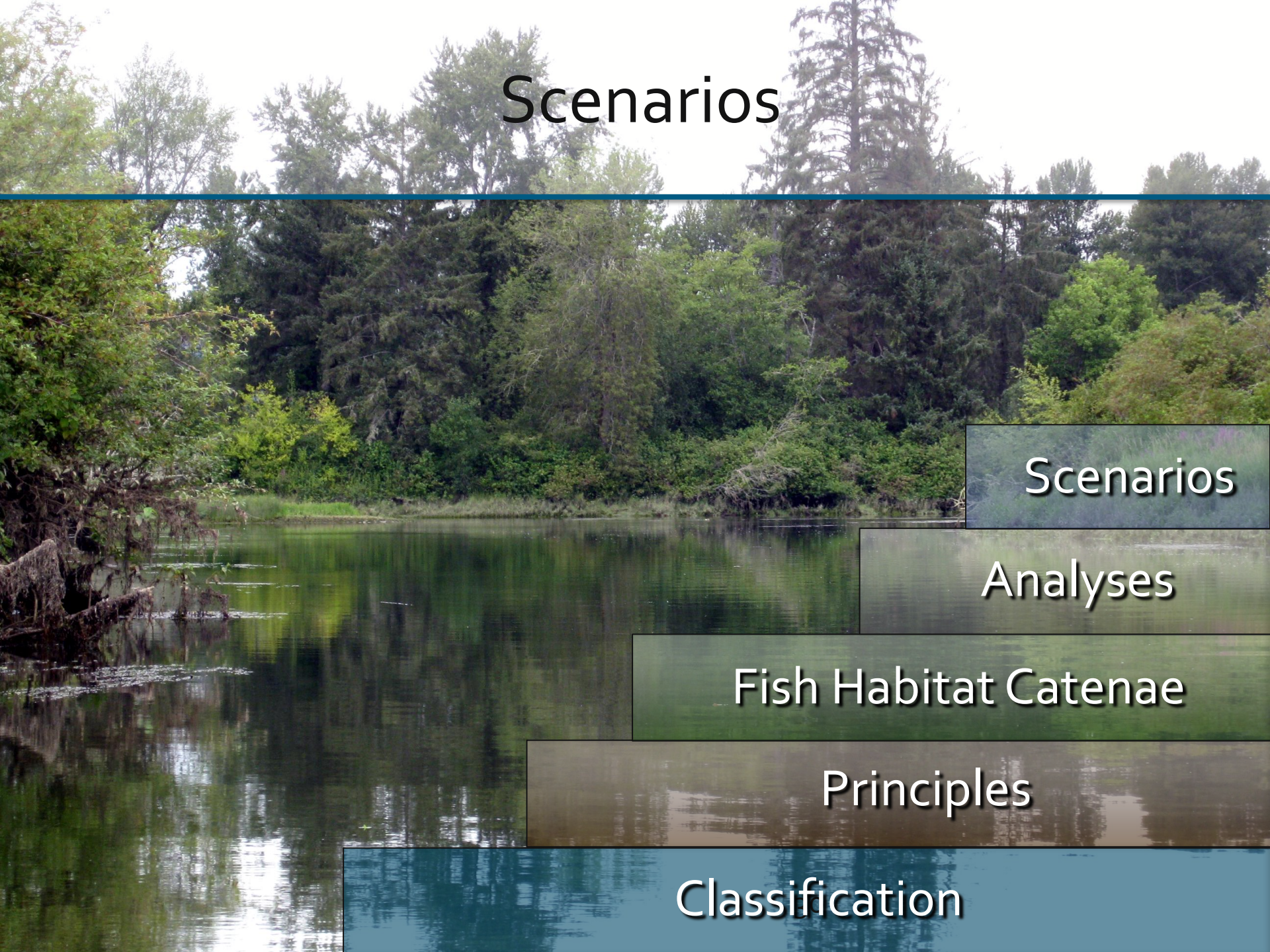
Applications: Evaluate Restoration Sites

Restoration Site: Possible Metrics

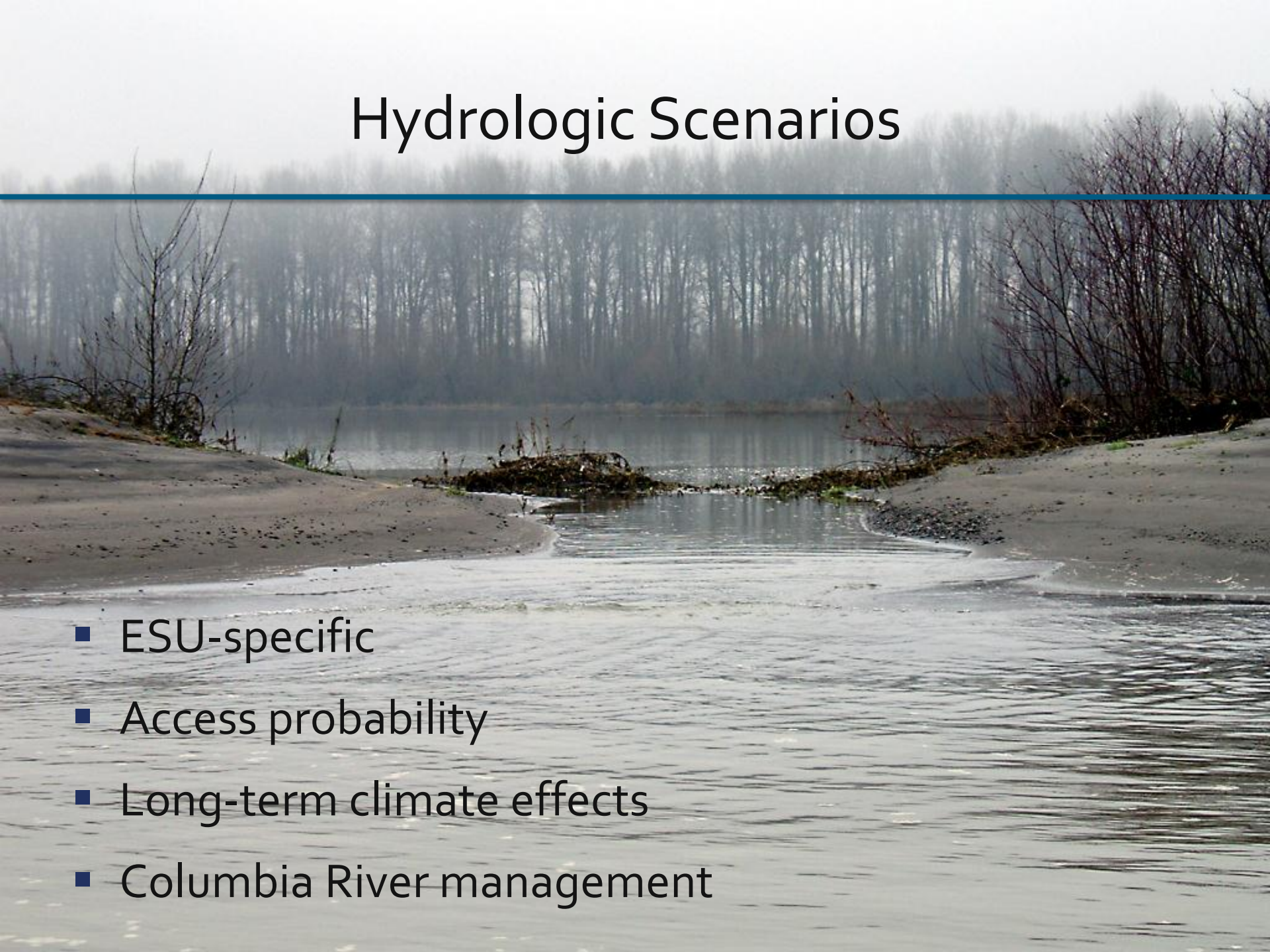


LEGEND
Total Area = acres
Edge Density = meters/hectares
Node Density = # nodes/acres x 10,000

Scenarios


Scenarios
Analyses
Fish Habitat Catenae
Principles
Classification

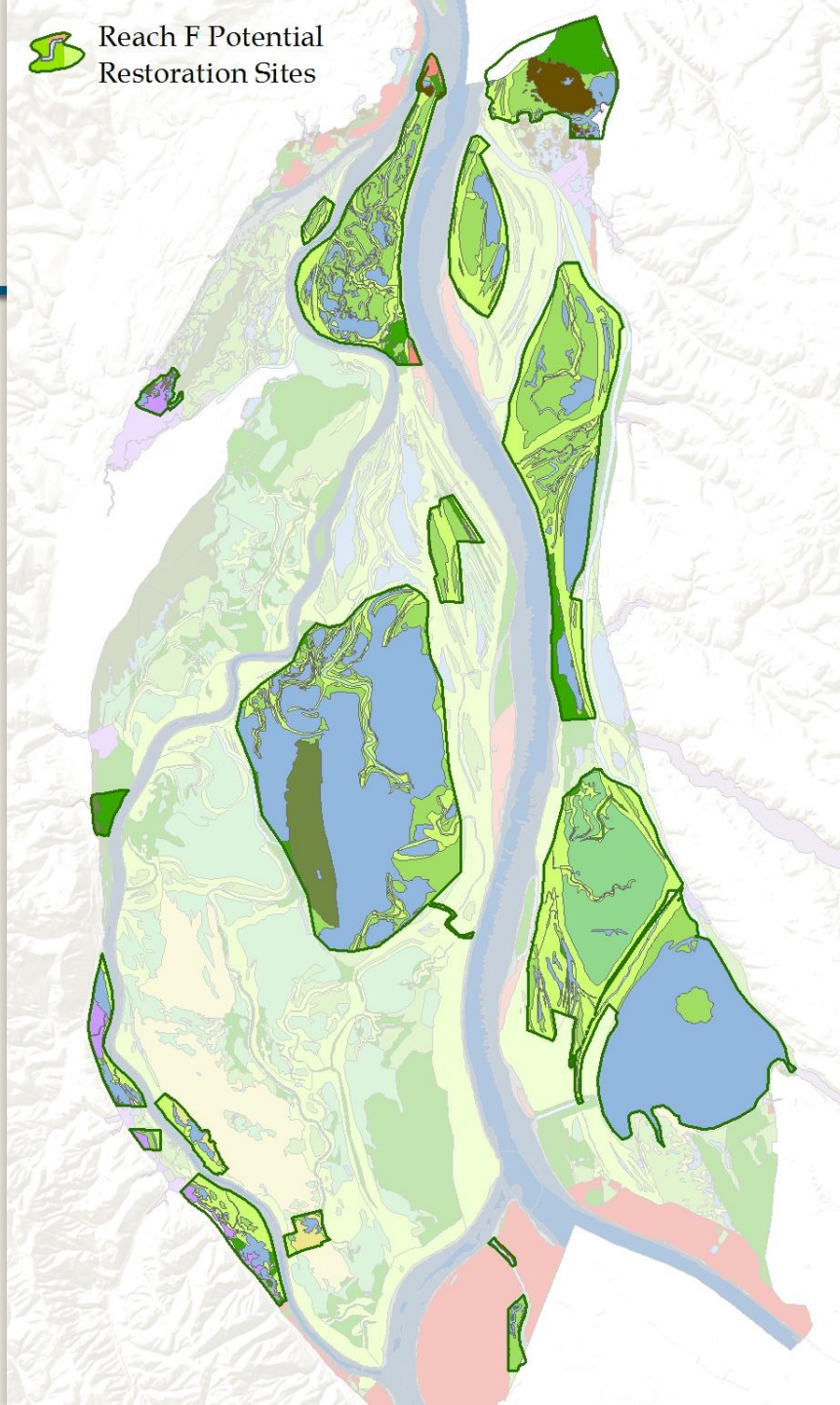
Hydrologic Scenarios



- ESU-specific
- Access probability
- Long-term climate effects
- Columbia River management

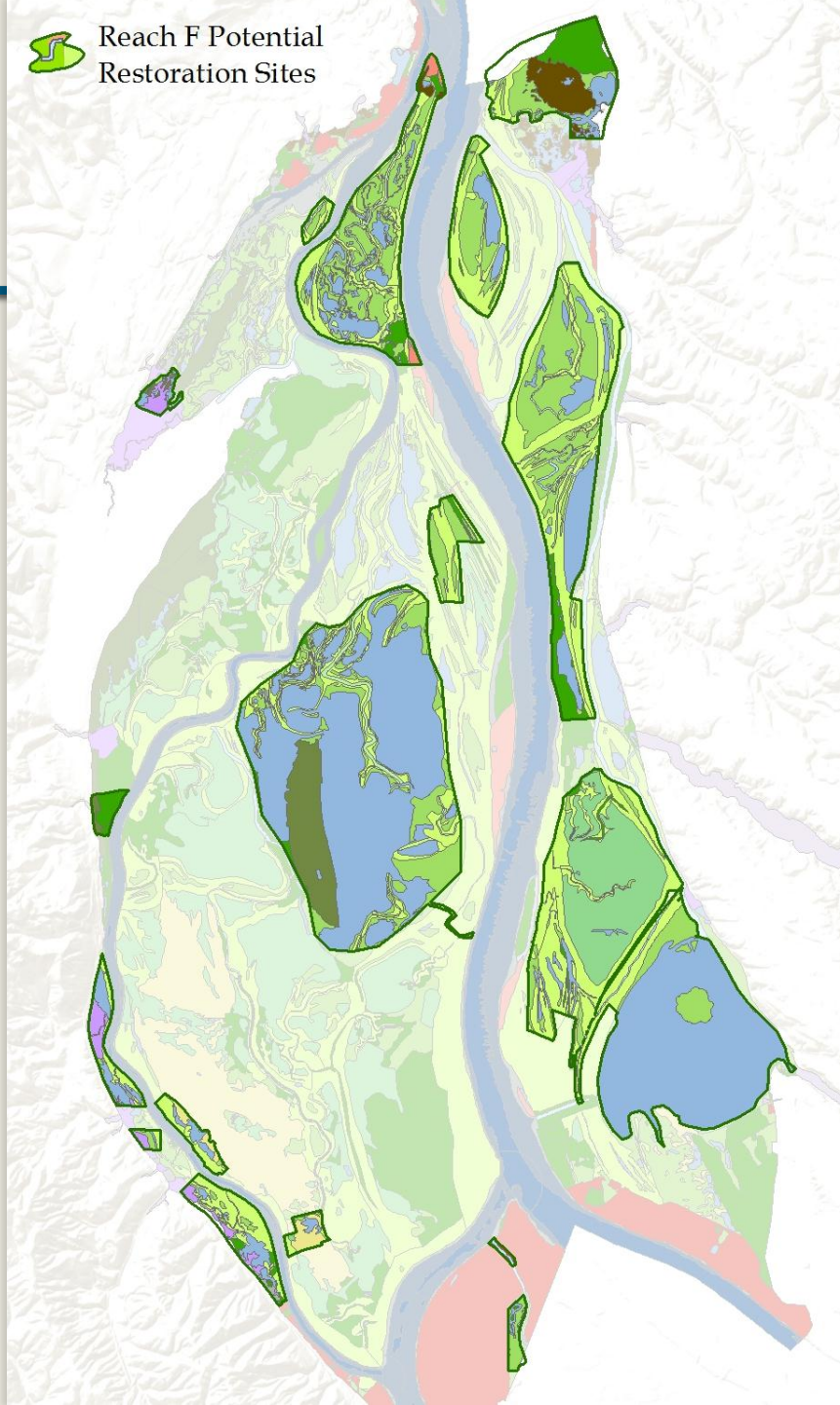
Tool for Strategic Decision Making

- ✓ Large enough
- Connected
- Suitable
- Enough places through time
- Maintained



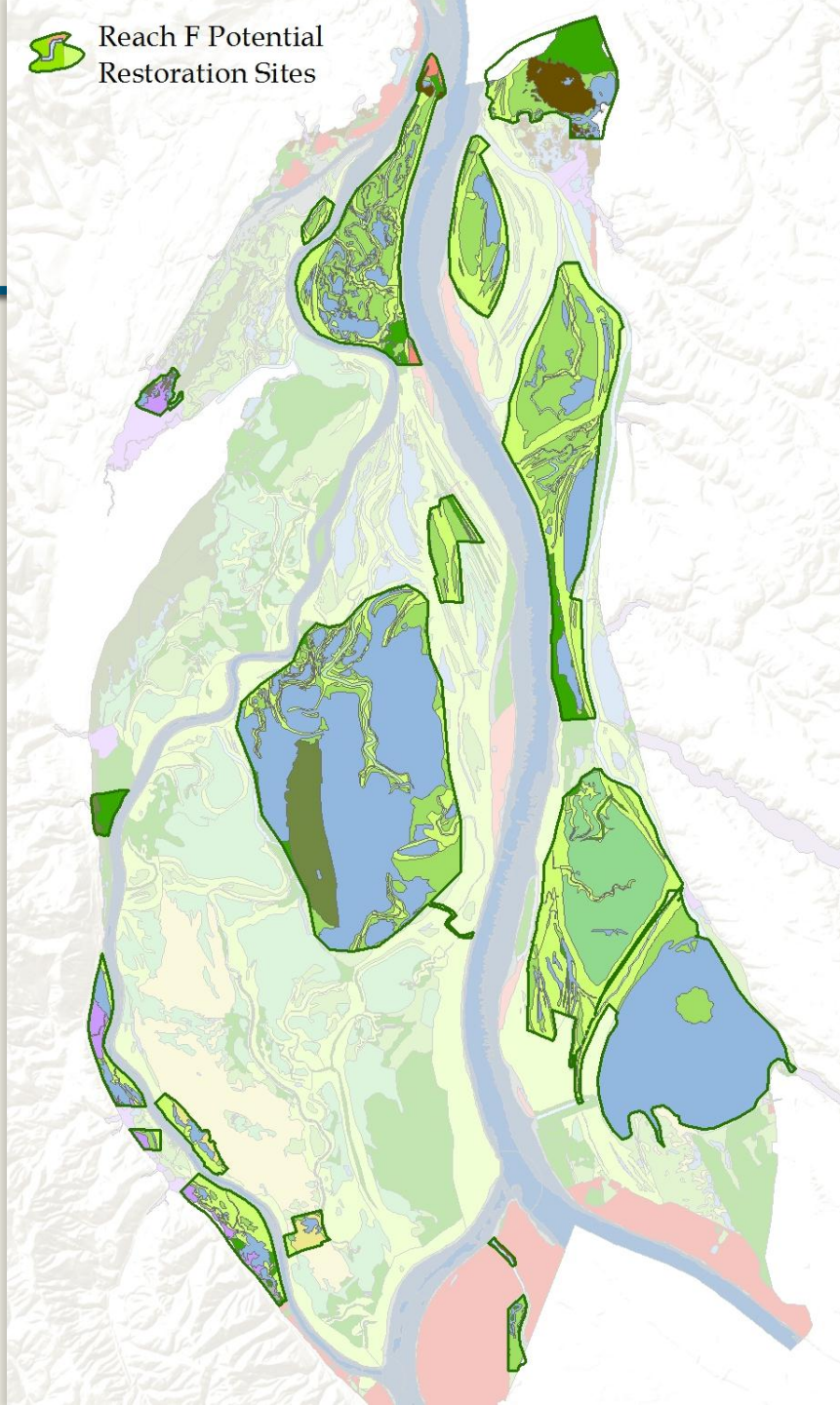
Tool for Strategic Decision Making

- Large enough
- ✓ Connected
- Suitable
- Enough places through time
- Maintained



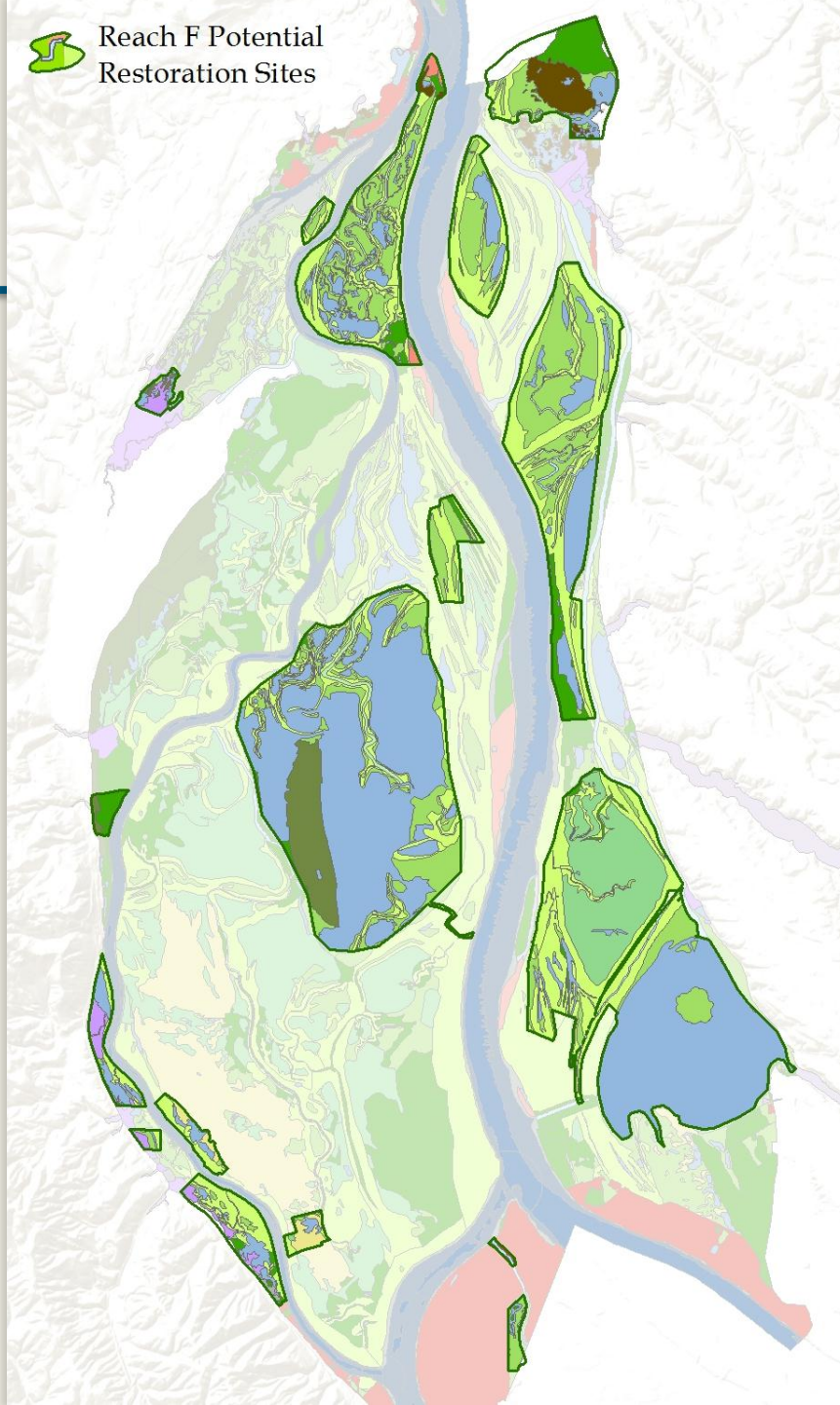
Tool for Strategic Decision Making

- Large enough
- Connected
- ✓ Suitable
- Enough places through time
- Maintained



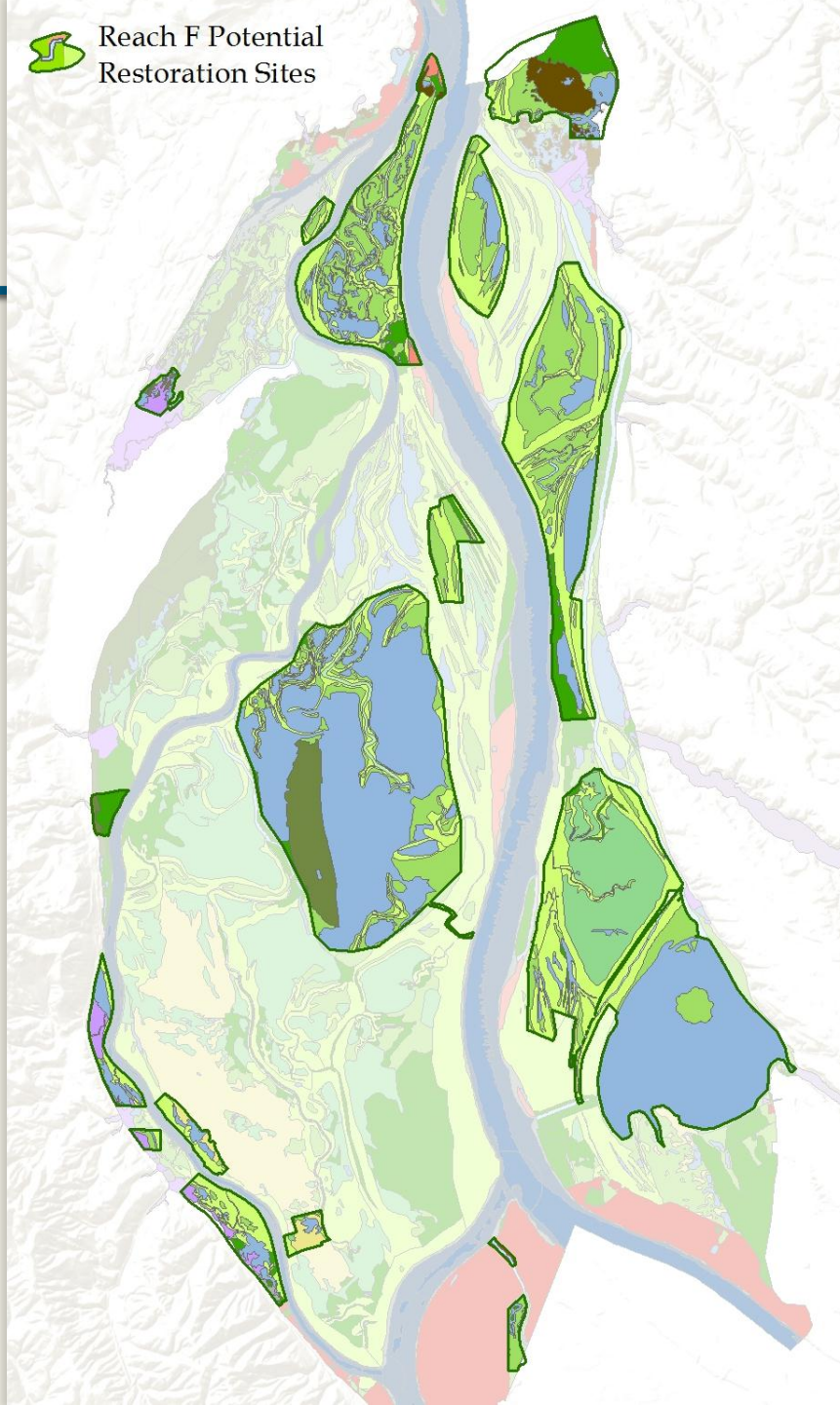
Tool for Strategic Decision Making

- Large enough
- Connected
- Suitable
- ✓ Enough places through time
- Maintained



Tool for Strategic Decision Making

- Large enough
- Connected
- Suitable
- Enough places through time
- ✓ Maintained



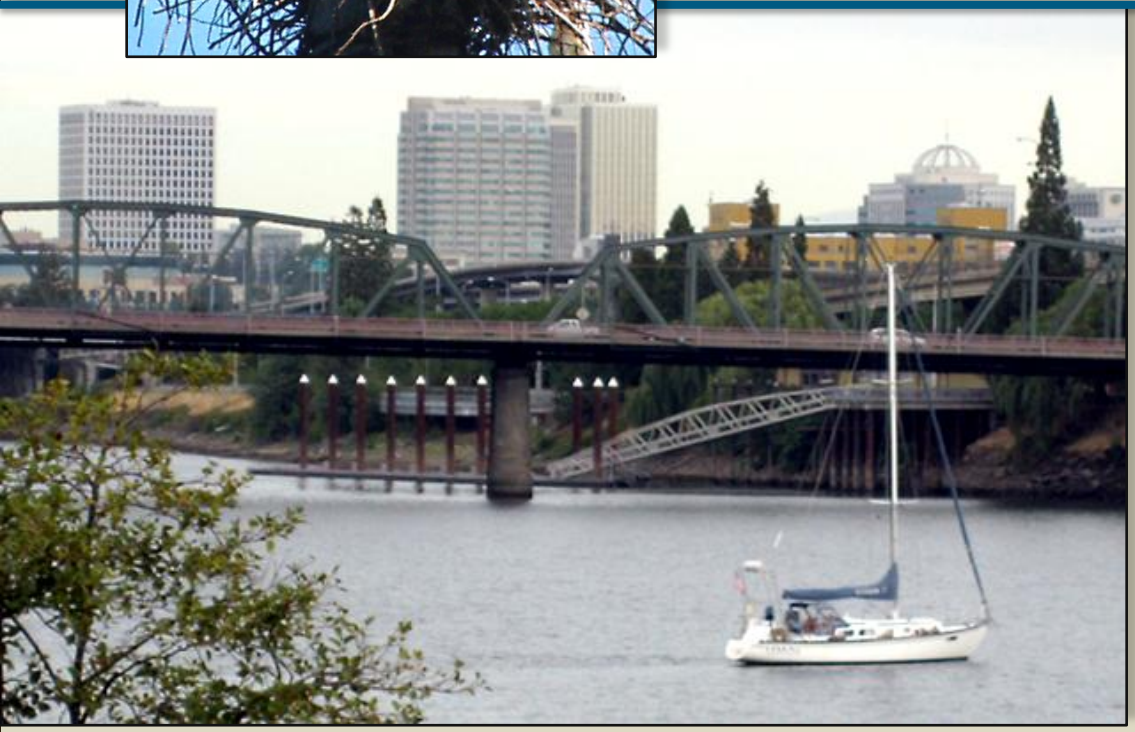
Scientifically Sound

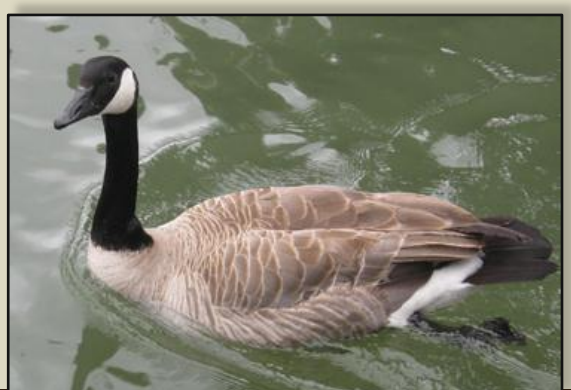
- Dan Bottom, NOAA
- Peter Goodwin, University of Idaho
- Greg Hood, Skagit Cooperative
- Jack Stanford, University of Montana
- David Teel, NOAA

Progress to Date

- Literature basis
- Principles and metrics
- Adapting to all reaches
- Integrating with other efforts
- Stakeholder outreach, March 2013

Beyond Salmon





Funding from BPA

Contact

Phil Trask • *phil@pctrask.com*

Si Simenstad • *simenstd@u.washington.edu*