Environmental Protection Agency: West Coast Estuaries Initiative Grant

Overview of Watershed Characterizations in Thurston County

Presented By:
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Purpose of Presentation

- Provide information on why the proposed work is important to Thurston County and Puget Sound
- Provide a Background of Watershed Characterizations
- Provide how the watershed characterization results can be used
EPA Grant:
Protecting Puget Sound Watersheds
Water Quality and Aquatic Resources from the Impacts of Growth

- Award allows continuation of work completed in Henderson Inlet in 2007
- Priority watersheds:
  - Totten and Eld Inlets (Completed 2009)
  - Deschutes River (Completed 2010)
  - Nisqually River (2011)
- Stormwater and non-point source pollution impacts
- Protect water quality from pathogens, toxics, and excess nutrients
- Protect habitat including riparian forests, shorelines, floodplains, wetlands, and marine waters
- Protect ecosystem biodiversity and recover threatened species
Intent of Watershed Characterizations:

- Combine technology with accepted science to assist County decision-makers in the formulation of effective local land use and water quality policies.
- To preserve, conserve, restore, and enhance the local region’s natural resources.
Accepted Science = Best Available Science?

- Peer Reviews (Booth and Horner, 2010)
  - Too complicated
  - Values used in the Matrix of Pathways and Indicators? Heat? Road crossings?
  - Watershed Condition Index?
  - Future Land-Use impervious values?

- Peer Reviews (Other)
  - Boundary delineations?
  - Land Cover values?
Goals of Watershed Characterization

• Assess the Current Condition of Ecological Processes in Thurston County’s Watersheds

• Develop a Prioritized List of Natural Resource Sites (wetland, riparian, and floodplain)

• Identify Avoidance and Minimization, Preservation, Restoration, Mitigation, to restore Hydrologic Function

• A watershed based approach to water management?
Water Resource Program
Policy Goals

- Future land-use decisions that accommodate growth while protecting and restoring natural processes and functions
- Restore hydrologic function using natural resource sites vs. engineered infrastructure where feasible
- Protection and recovery of listed species
- Habitat Conservation Plans?
- Provide sites for compensatory mitigation options (In-lieu Fee and Wetland and Prairie Banks)
- Low Impact Development?
Science of Ecosystem Analysis

- Assessment of County Watersheds - “Health”
- Analyze Ecological Processes – “Diagnosis”
- Identify Areas of Opportunity for Restoration/Mitigation - “Prescriptive Treatment”
- Geographic Information System (GIS) – “Tools”
Methodology

Watershed Characterization

Data Process and Analysis Workflow

Condition for each process is then weighted based upon study area grade. A contouring score is added to each process. The score of all processes is calculated, and individual DAUs are then analyzed and environmental benefit based upon the total.

Environmental Enhancement Benefit

Combination DAU and Resource Site Scoring

Resource Sites

Data Sites

Wetlands

Floodplain

Riparian Areas

Fish Habitat

Site Type

Site Used

Site Evaluation

Resource Sites

Site Scoring and Benefit

EPA Grant

7/20/2012
Scale of Analysis?

- Center for Watershed Protection Guidelines
- Typical Area is 0.25 square miles (160 acres)
- Impervious Cover has a strong influence
- Stormwater Management and Site Design Scale

**Deschutes Geography**
- 170 square miles
- 275 DAUs
- 12 Sub-watersheds
Imagery:
Foundation for a Watershed Characterization

• SPOT 10 meter Multi-spectral Image
• Acquired July 2009
• Ground Truth with July 2009 Aerials
• Recently acquired 2010 imagery for Nisqually Watershed Characterization
Land Cover Classification
Landscape Indicators

- Total Impervious Area (TIA)
- Forest Cover
- Prairie Cover
- Wetlands
- Floodplains
- Riparian Zones
- Stream Channel Straightening

- Index of Biotic Integrity
- Road Density
- Habitat Connectivity
- Stream Crossings
- Bare Soils
- Impaired Water Quality
- Steep Slopes
Capitol Land Trust – Deschutes River Site
In Lieu of Fee: Preservation and Restoration
One Landscape Indicator – Total Impervious Area (TIA)
Indicators for One Ecological Process: Movement of Water

- Forest Cover
- Impervious Area
- Wetlands
- Floodplain Decoupling
Movement of Water – Final Result

Four Indicators:

- Forest Cover
- Impervious Cover
- Wetlands
- Floodplain Alterations
Ecological Processes Combined

Ecological Processes

- Movement of Water
- Movement of Wood
- Movement of Sediment
- Movement of Heat
- Movement of Pollutants

Biological Elements

- Aquatic Integrity
- Habitat Connectivity
Resource Site Analysis

- Current Wetlands
- Historical Wetlands
- Potential Wetlands
- Stream Typing
- Fish Usage
- Floodplains
- Geology
- Soils
- Forested Areas
Results in Eld Inlet

- Sites identified for *riparian* restoration
Preliminary Results in Deschutes

- Riparian sites identified high for restoration
Why is the Data Valuable?

- Identifies appropriate places to accommodate future growth while protecting natural resources

- Potential On-site and Off-site Mitigation Opportunities

- Compensatory Mitigation (In-Lieu Fee and Wetland and Prairie Banks)

- Incorporate results in Capital Facility Planning and Conservation Futures

- Update of completed Basin Plans
County Codes may need updating to allow:

- **Mechanisms for Compensatory Mitigation**
  - Permittee-Responsible Mitigation
  - Mitigation Banking ("off-site")
  - In-Lieu Fee Mitigation ("off-site")
Policy Impacts, con’t.

• Opportunity to focus Conservation Futures funding to purchase priority sites

• Continued evaluation of the Thurston County’s Drainage manual
  ➢ Example: Sub-Area specific development regulations

• Asset Management System to deliver new data to Current and Strategic Planners
Recap

- The purpose of this project is to complete a spatially-explicit landscape characterization of priority sub-watersheds
  - Outputs (Deliverables) include:
    - Updated inventory of land cover
    - Prioritized list of natural resource sites (wetlands, riparian and floodplain sites)
    - Scientific database for preservation, restoration, and mitigation opportunities
    - Completed report of each study area
  - Outcomes include:
    - Scientific basis for decision making, amending and updating County plans and land-use codes
    - Capital facility planning and conservation acquisitions
Thank You! Questions/Comments

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