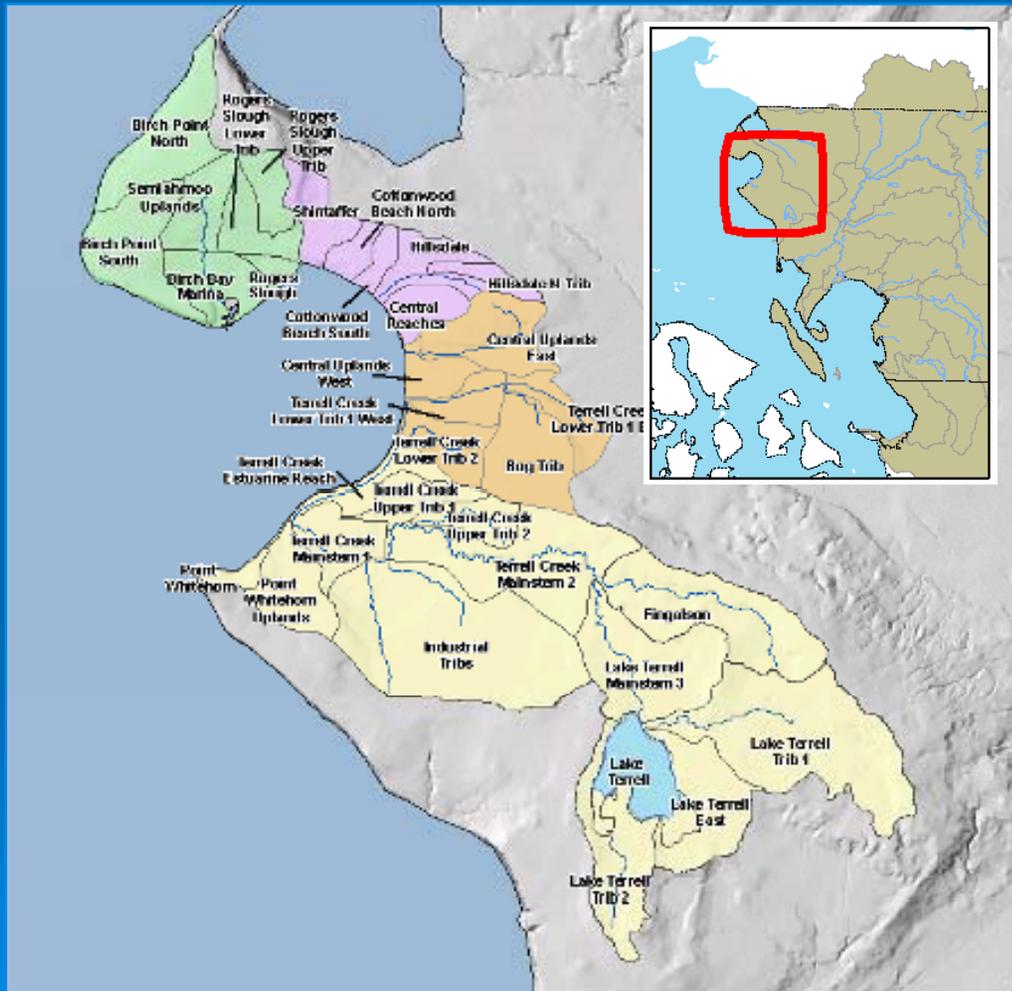


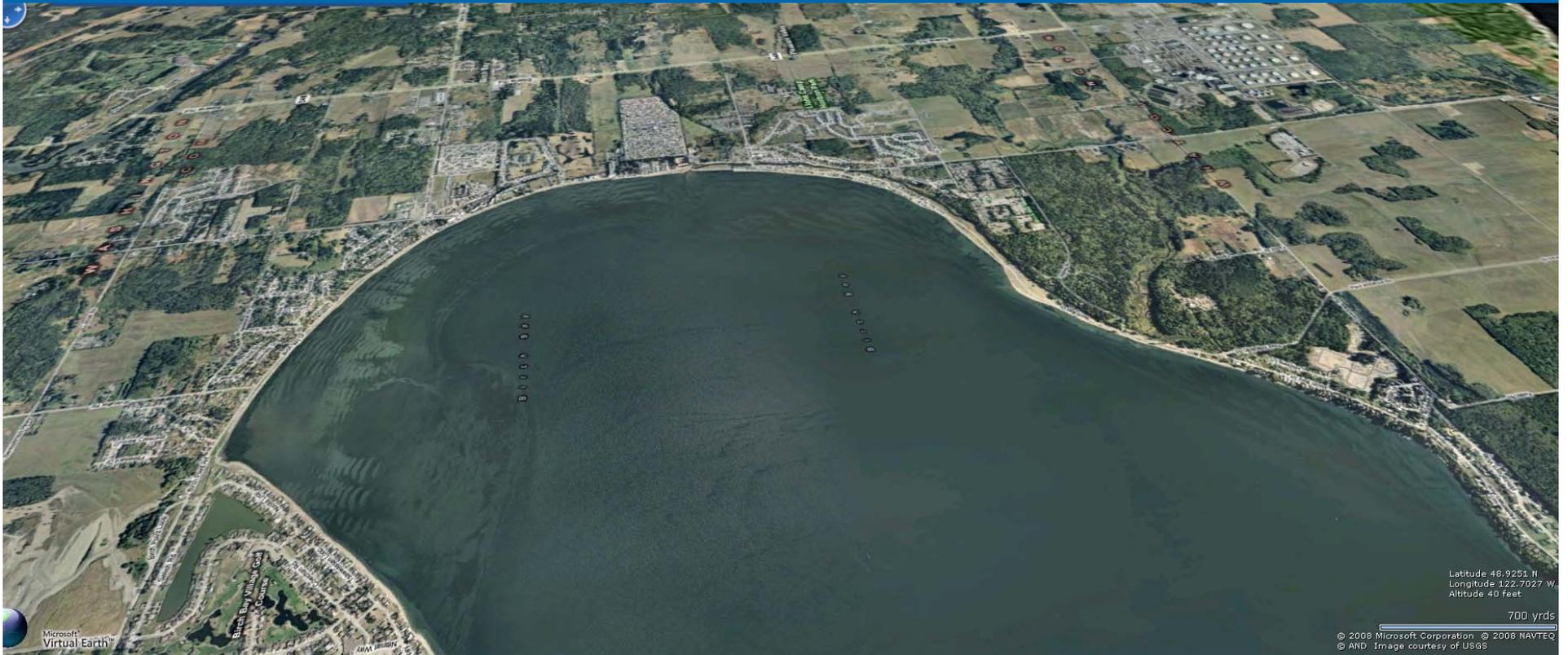
A Watershed Based Management Plan for Birch Bay



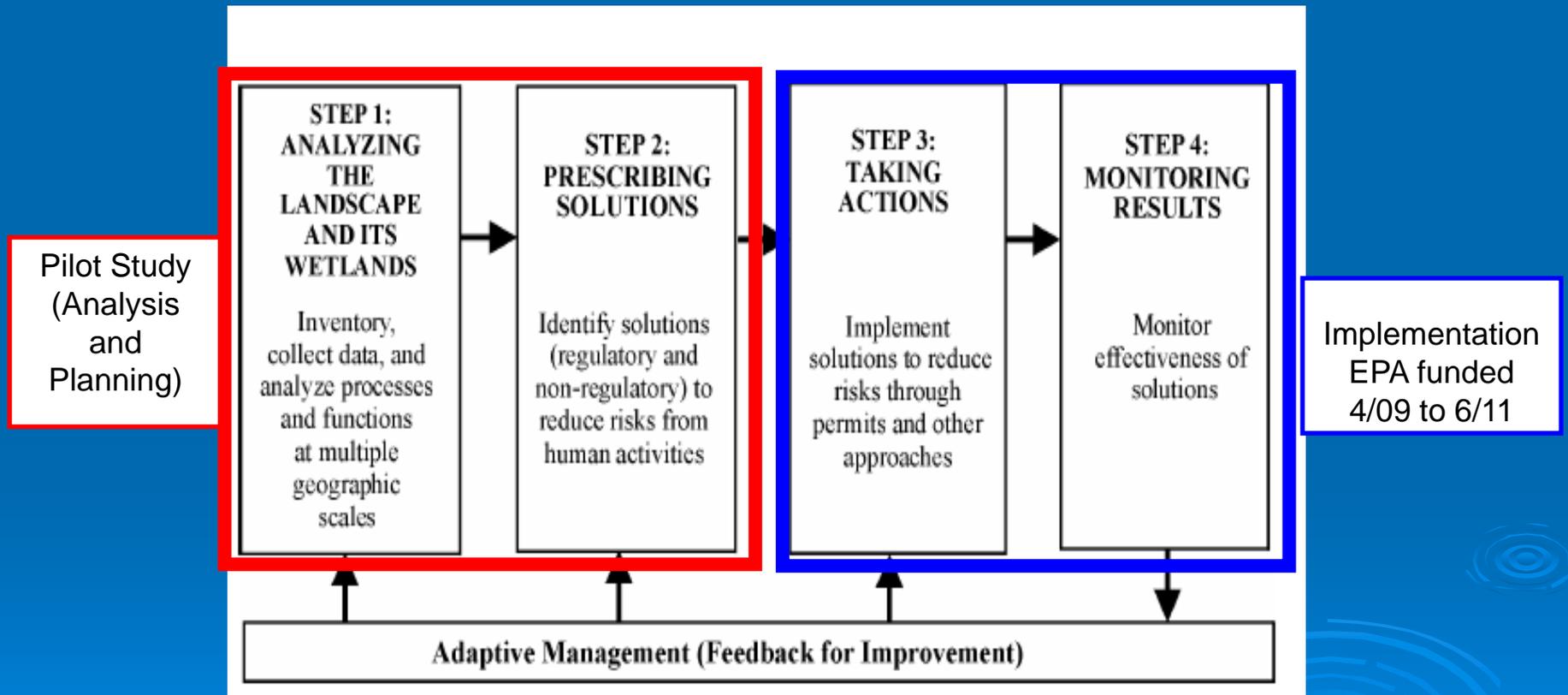
A Coordinated Approach

- Whatcom County
- Local Citizen Groups
- WA Dept of Fish & Wildlife
- WA Dept of Ecology
- WA Dept of Transportation
- WA Dept of Community Trade & Economic Development
- Puget Sound Partnership
- Environmental Protection Agency

A Watershed Based Management Plan for Birch Bay



Watershed Planning Process



Objectives of Watershed Plan

- Identify important **ecosystem relationships** within the Birch Bay watershed
 - Areas sensitive to changes from land use
 - Areas where protection and restoration can address current problems (reduce risk)
- Provides a framework for **coordination of planning** activities
 - Comprehensive Plan, Shoreline Management Plan and Critical Areas Ordinance update

Components of the Plan

Inventory of (Step 1)

- Environmental Problems (Risks)
- Wetlands
- Streams and Riparian areas



Analysis of (Step 1)

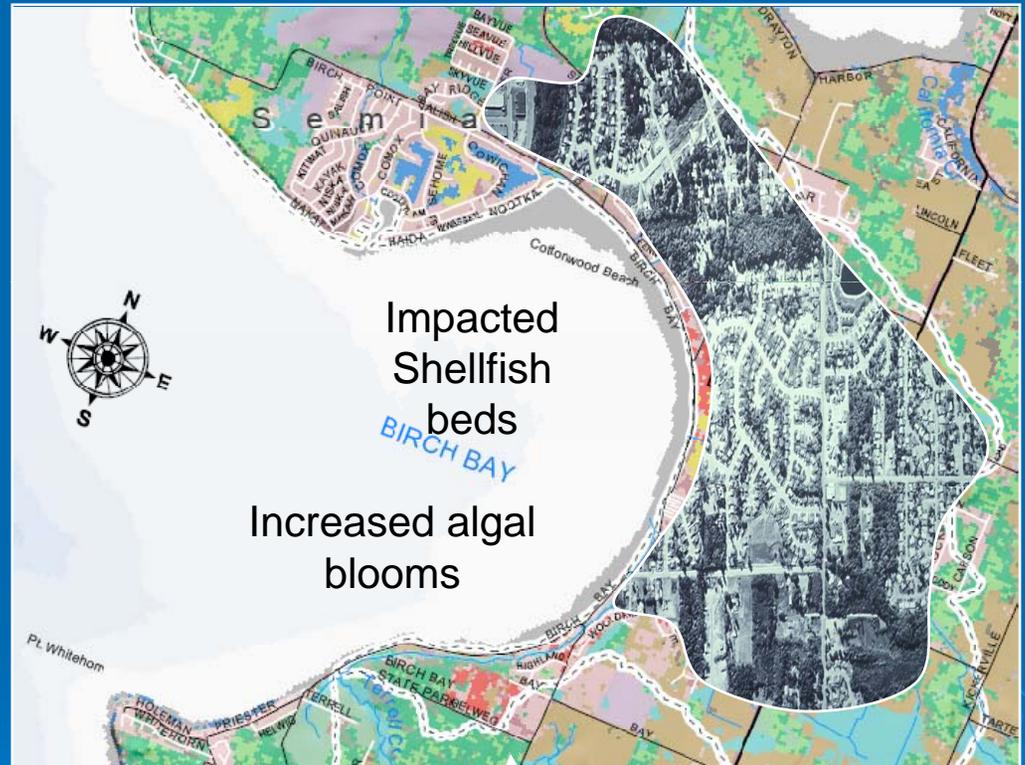
- Water quality and water flow processes
- Wildlife and habitat conditions
- Future development patterns



Synthesis to develop watershed solutions (Step 2)

Step 1 - Inventory of Environmental Problems or “Risks”

- Water quality in Birch Bay
 - Pathogens
 - Nutrients
- Large population increase
- Loss of habitat and wildlife
- Decreased “quality of life” for residents



Potential loss of heron rookery

Step 1 – Analysis

Identify at three scales (broad, mid, fine) in watershed:

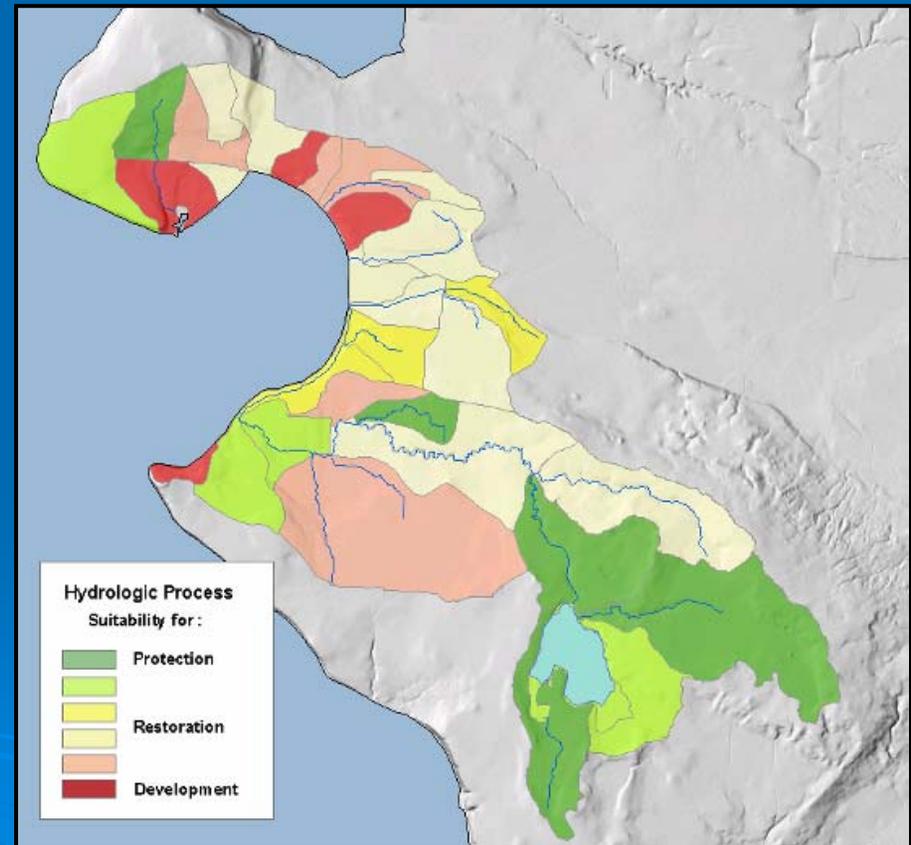
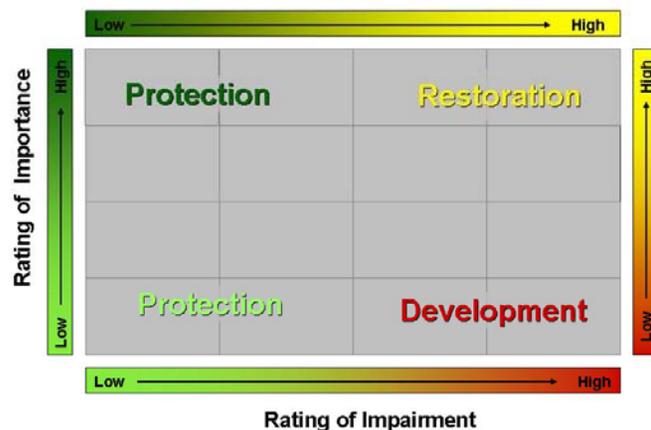
- Areas important for maintaining watershed processes and wildlife
- How these important areas have been altered
- Areas for protection and restoration

Characterization of Watershed Processes:

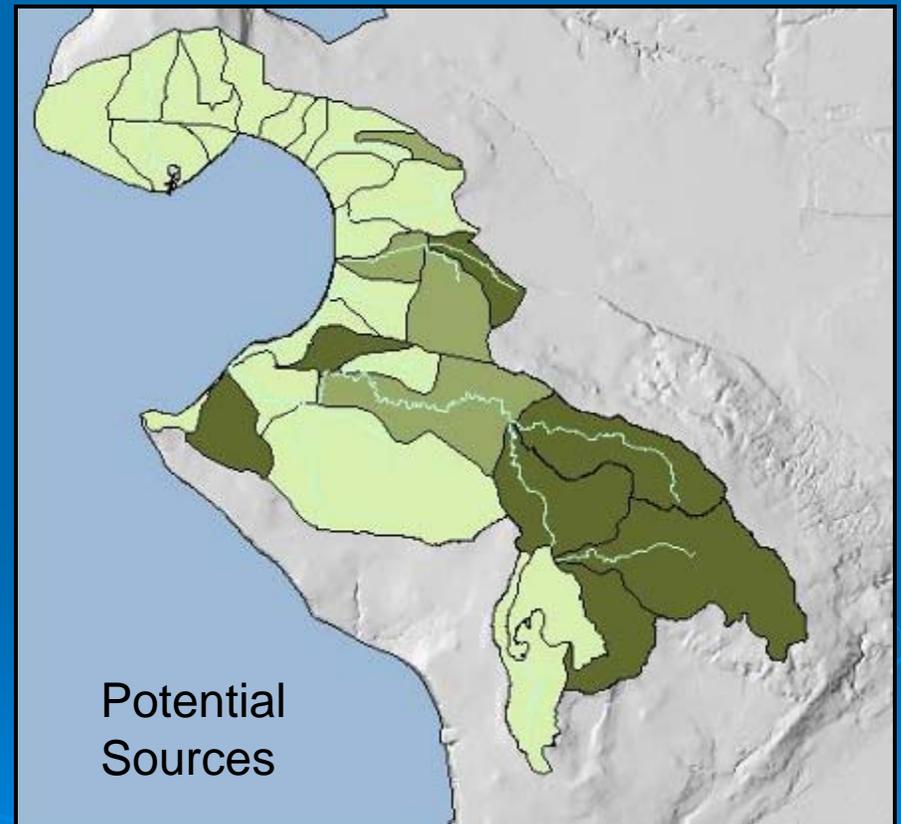
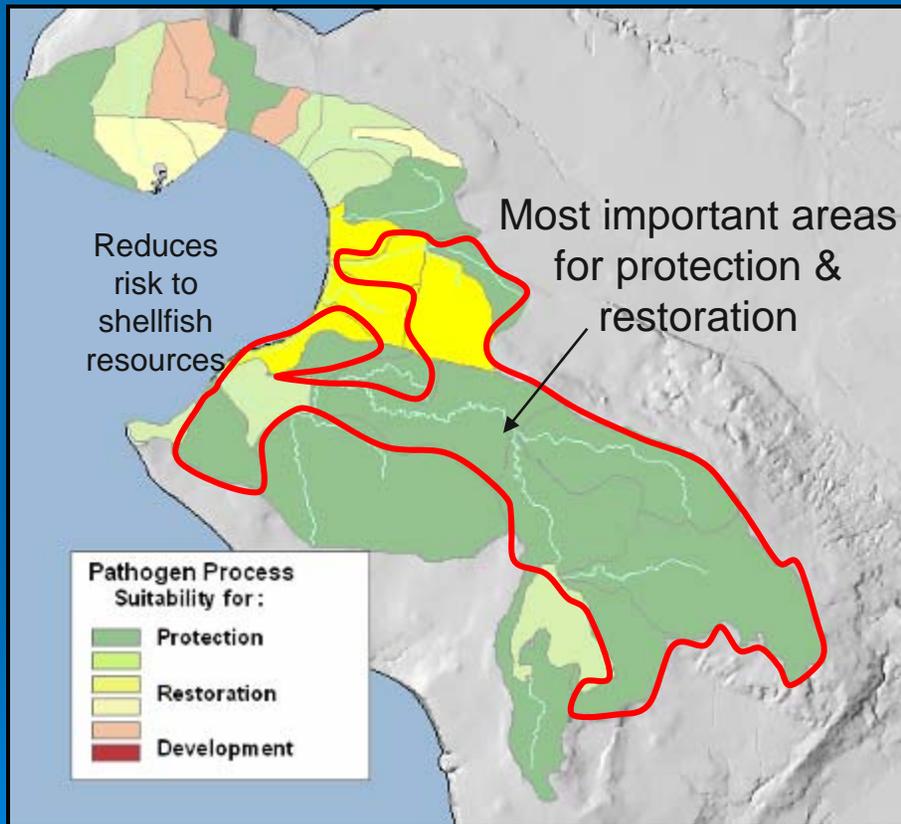
Water Flow
Nutrients
Pathogens

Important Areas for Restoring & Protecting Hydrologic Processes

Watershed Management Matrix



Important Areas for Pathogen Process Relative to Potential Sources



Fish & Wildlife Watershed Analysis

Broad and Mid Scale

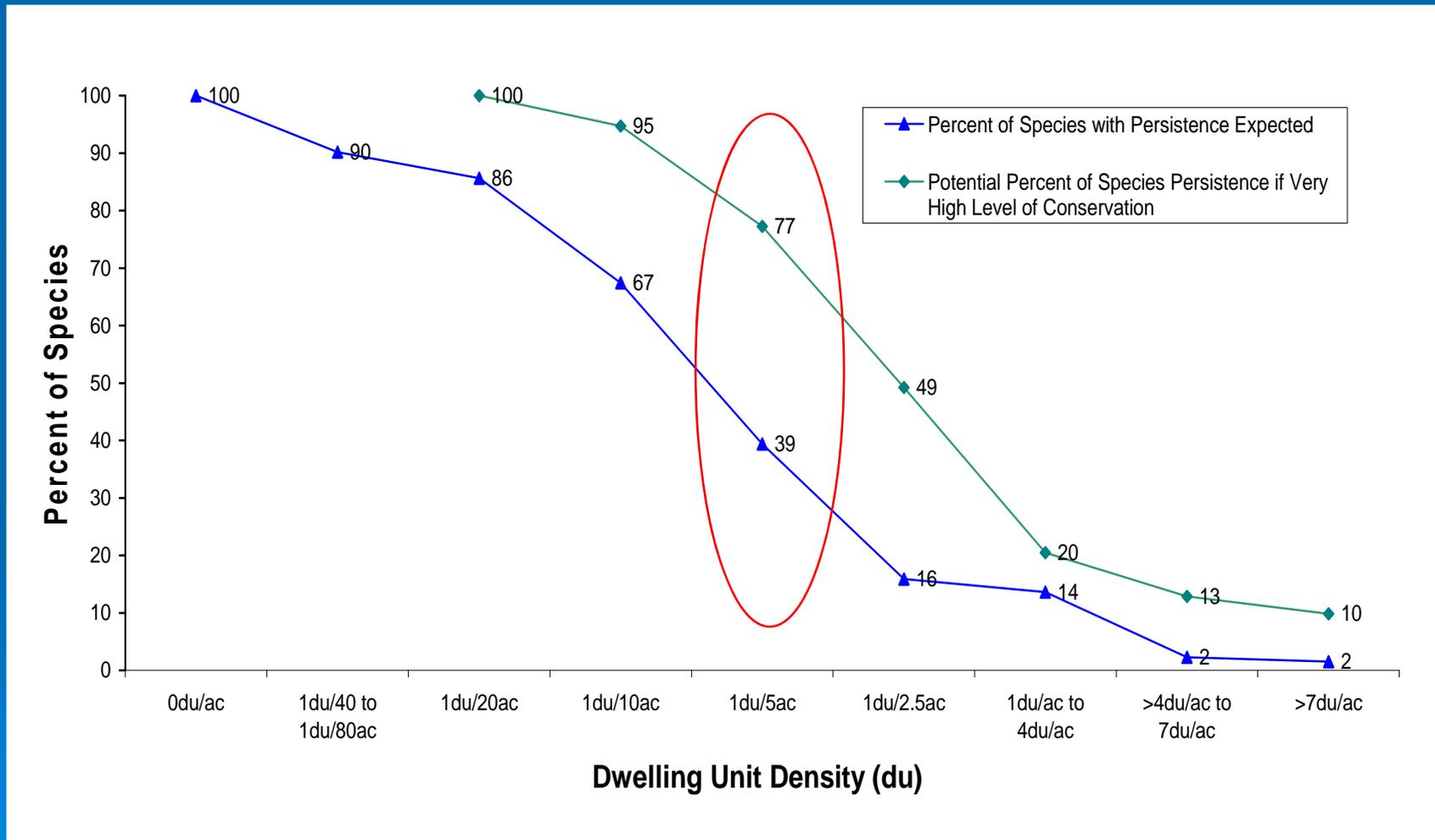
Current Conditions

Why Plan for Wildlife?

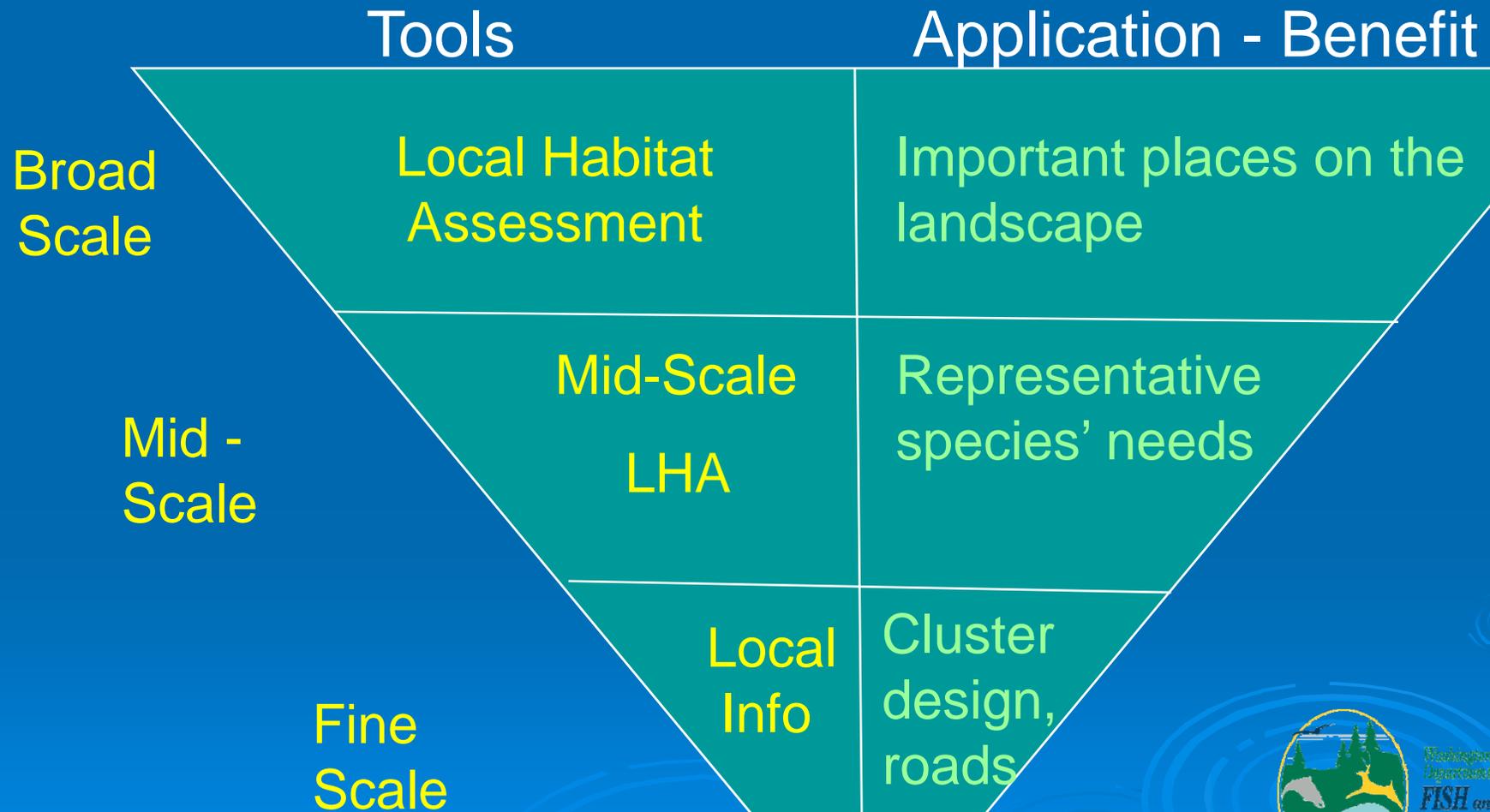
Birch Bay Watershed – Rich and Diverse Fauna

- 230 Terrestrial and Avian Species
- 80 WDFW Priority Species
- 21 Classified as Species of Greatest Conservation Need
- 24 Species with State Listing Status
- 3 Salmonid Species
- Very Productive Marine Habitats

Why Plan for Wildlife?



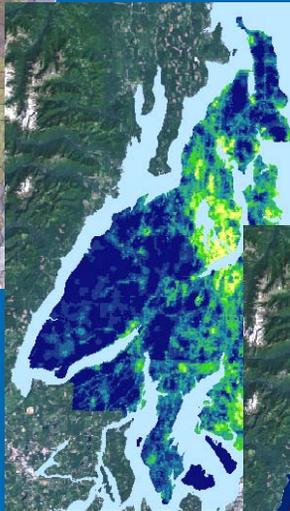
Landscape Planning for Washington's Fish and Wildlife



Local Habitat Assessment



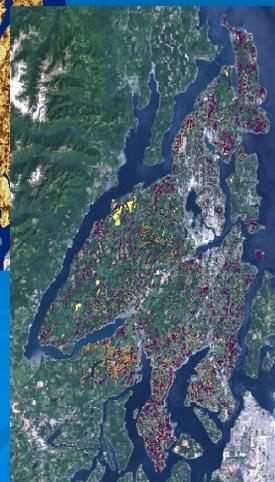
Ecoregional Assessments



Land Conversion

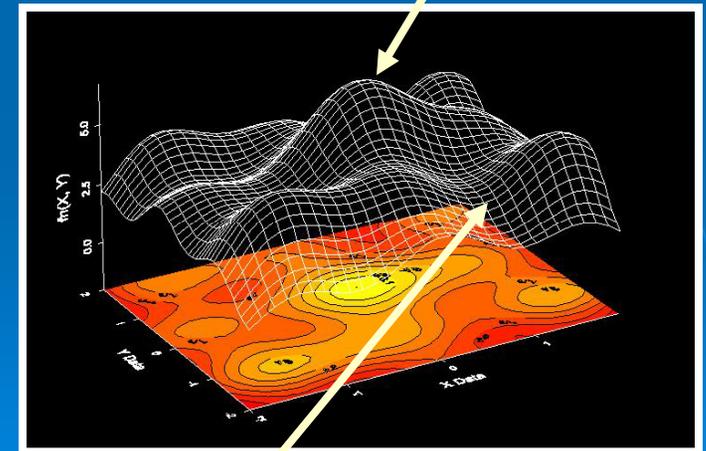


Road Density



**PHS/Heritage data
(local empirical data)**

=



**Peaks = Favorable
Ranking**

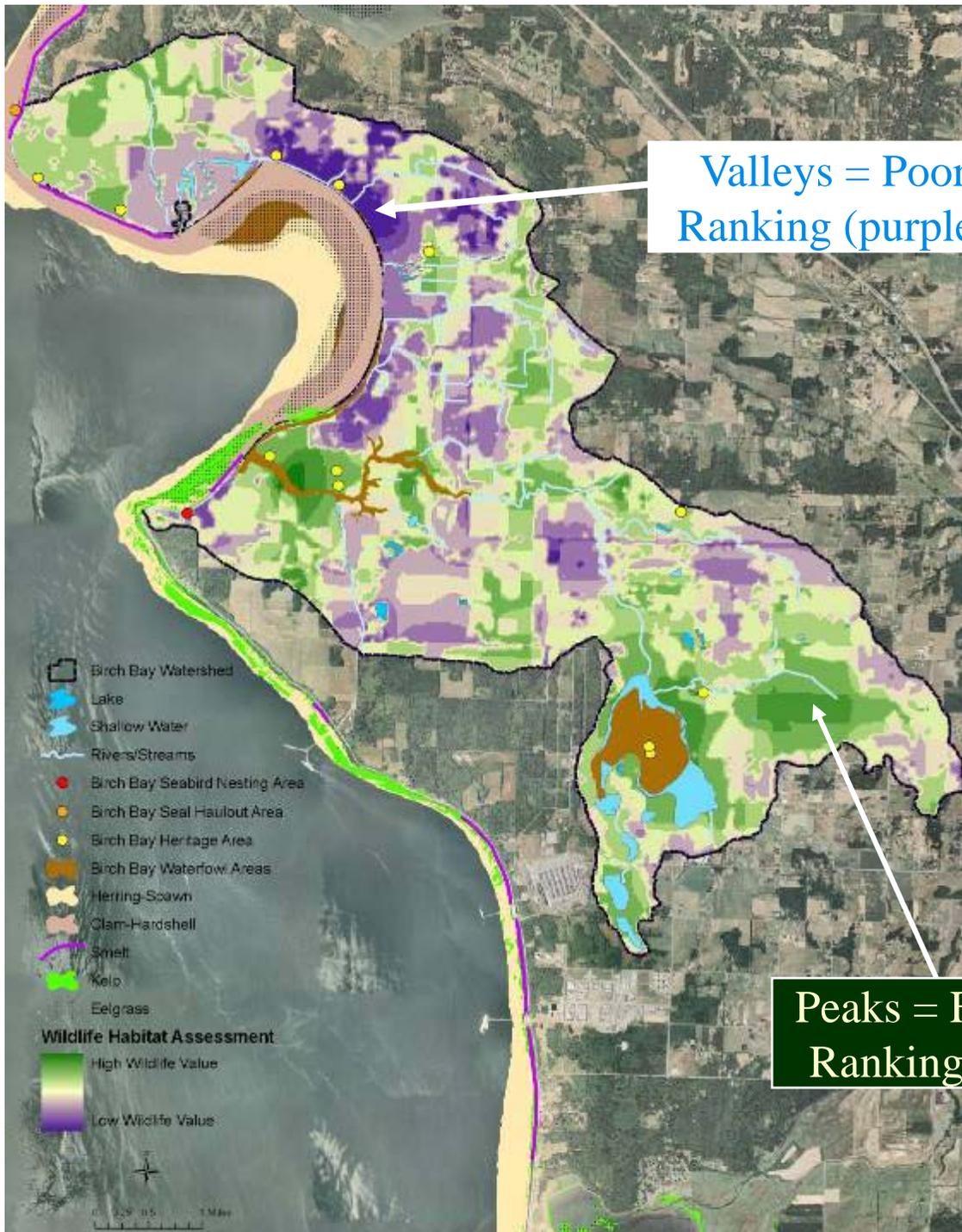
**Valleys = Poor
Ranking**

Valleys = Poor
Ranking (purple)

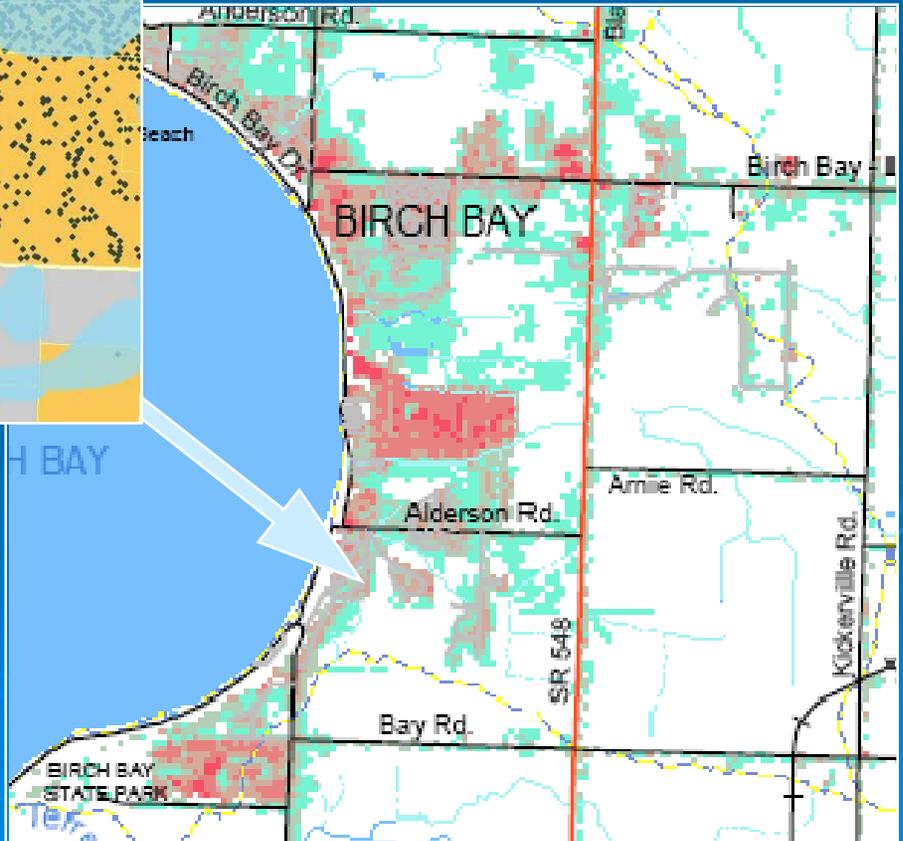
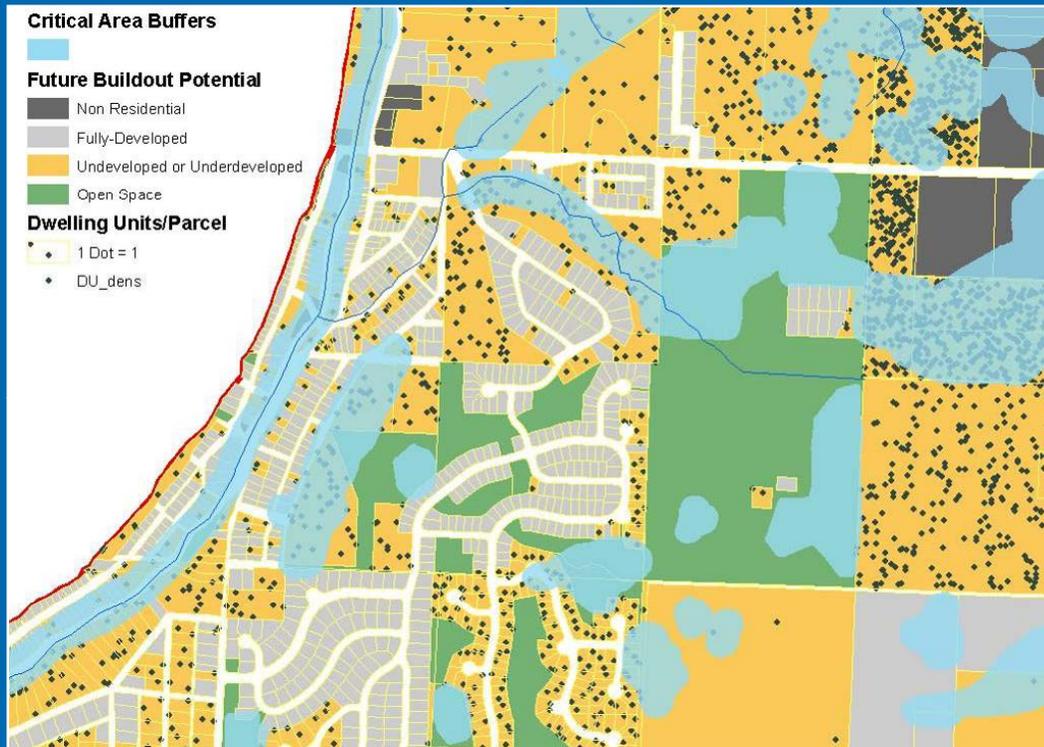
Results of Fish & Wildlife Analysis

Local Habitat Assessment – Broad Scale

Peaks = Favorable
Ranking (green)

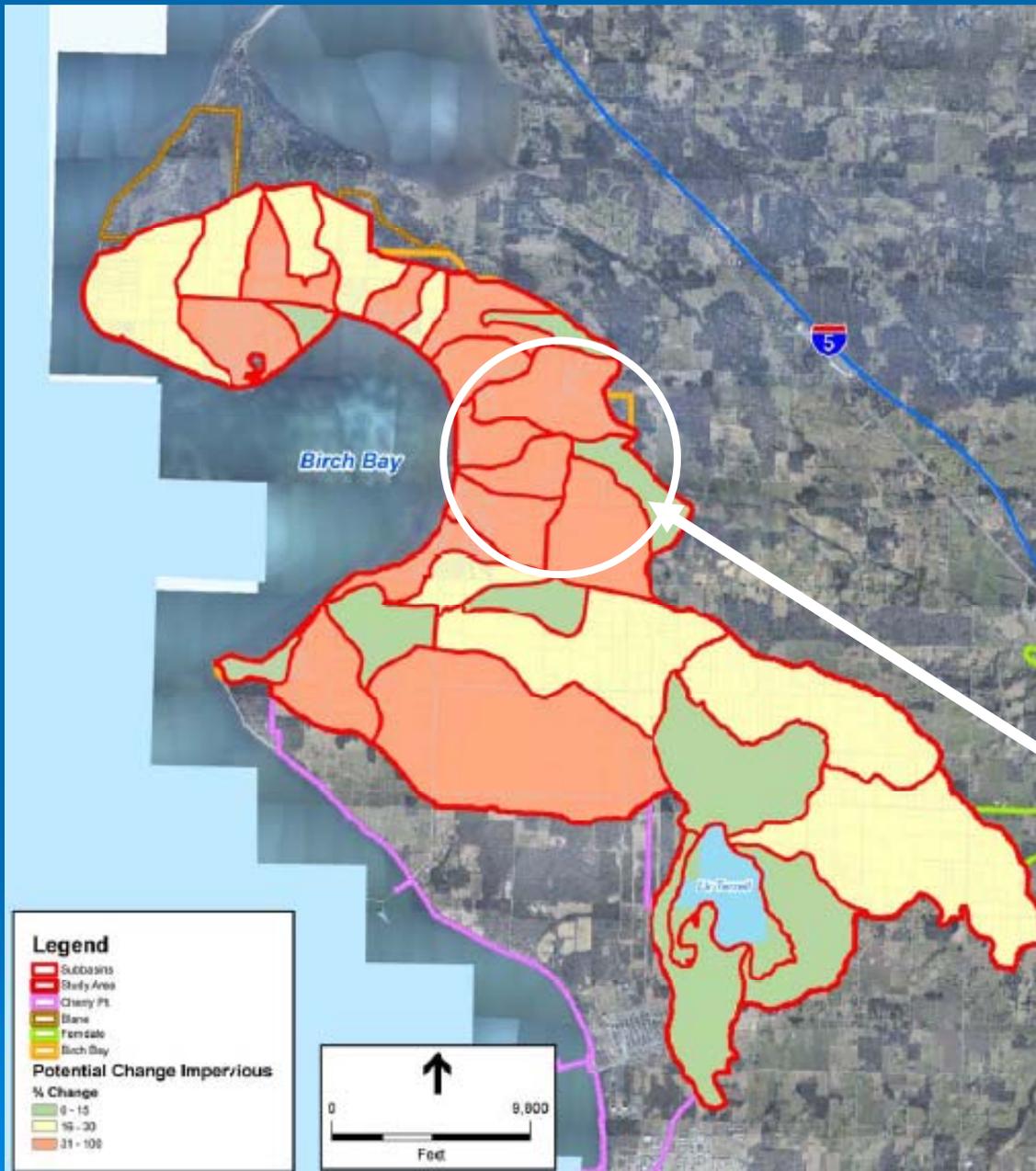


Effects of Growth on the System



➤ Impervious Surface Analysis

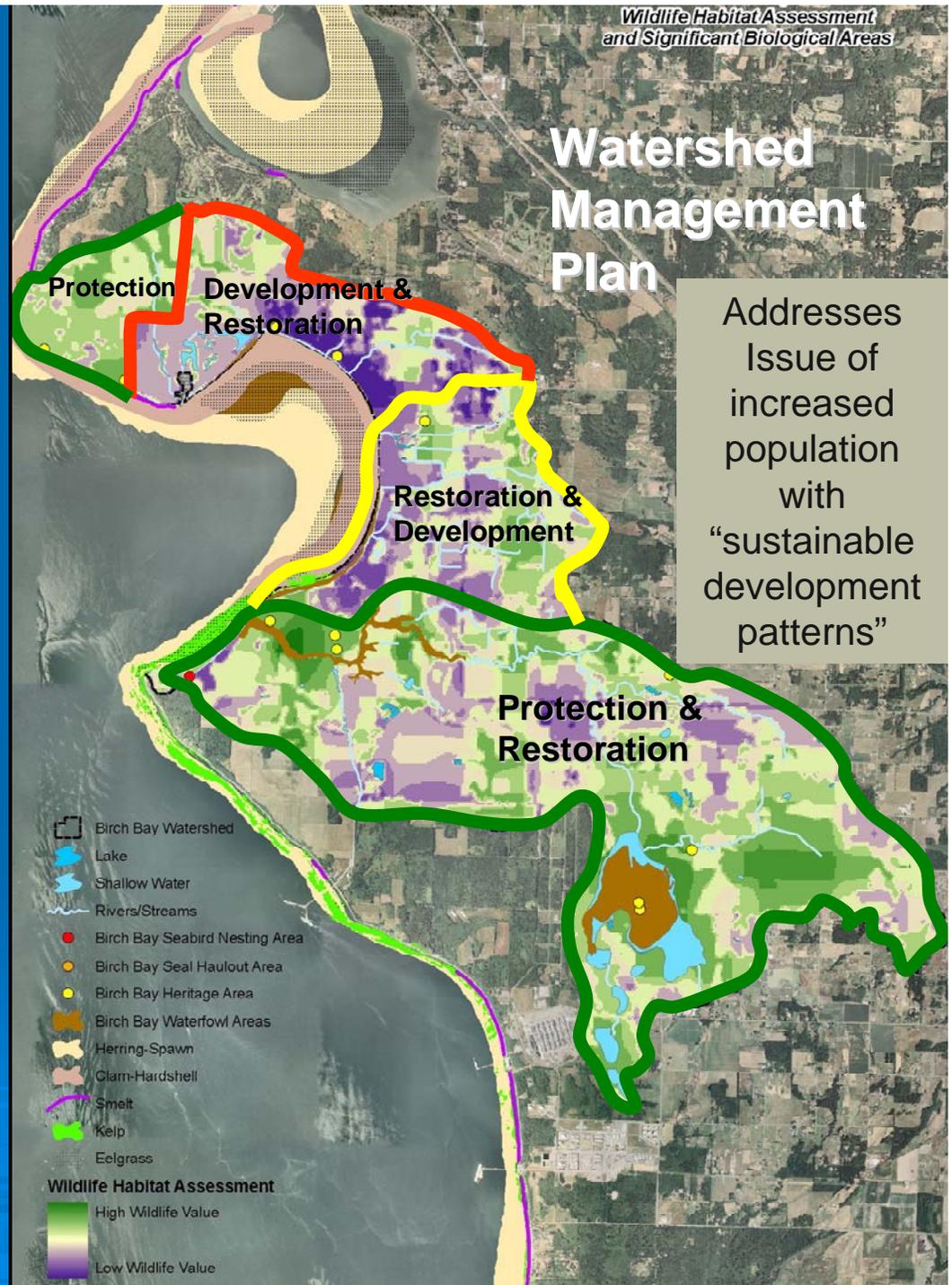
Potential Change in Impervious Cover



Conflicts in Central Sub-basins With Characterization Results

Synthesis: Identifying Solutions (Step 2)

- **Concentrate development** in “red” management units
- Allow use of **mitigation credits** in “yellow and green” zones for impacts in “red zone.”
- **Cluster development** in “yellow and green” zones.
- Use **low impact development** measures
- Provide for **habitat protection** overlay



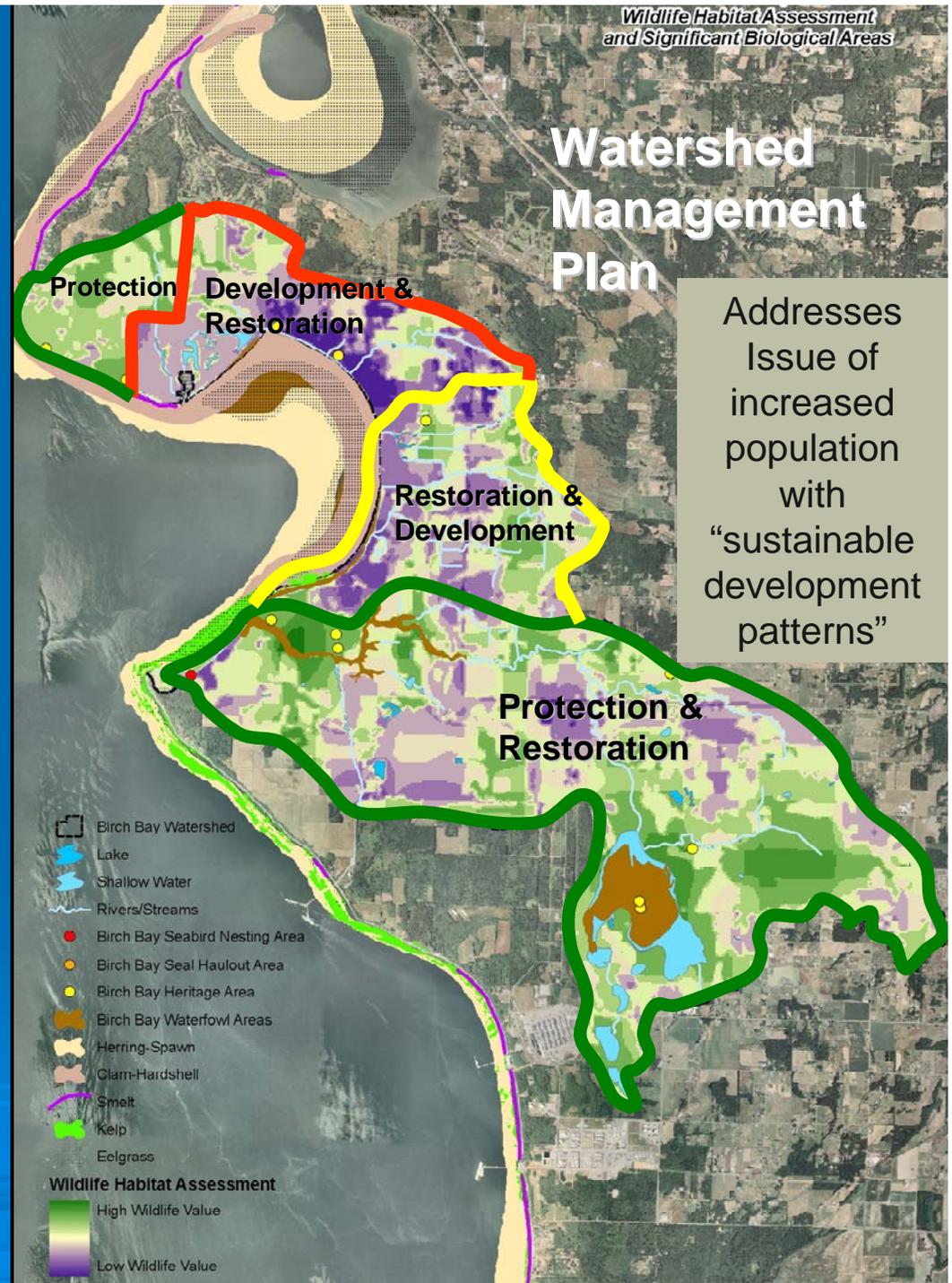
Synthesis of Results

- **Keep large areas** $\leq 1\text{ du}/10\text{ ac}$
- **Habitat Mosaic** - wetlands, open grassy areas, and connectivity areas, $\leq 1\text{ du}/20\text{ ac}$
- **Minimize new roads**, traffic softening, signs for crossings
- **Connectivity** – greater than 80% native vegetation cover
- **Flyways** – maintain 0.5 mile wide, no tall buildings or towers, greater than 80% native vegetation cover

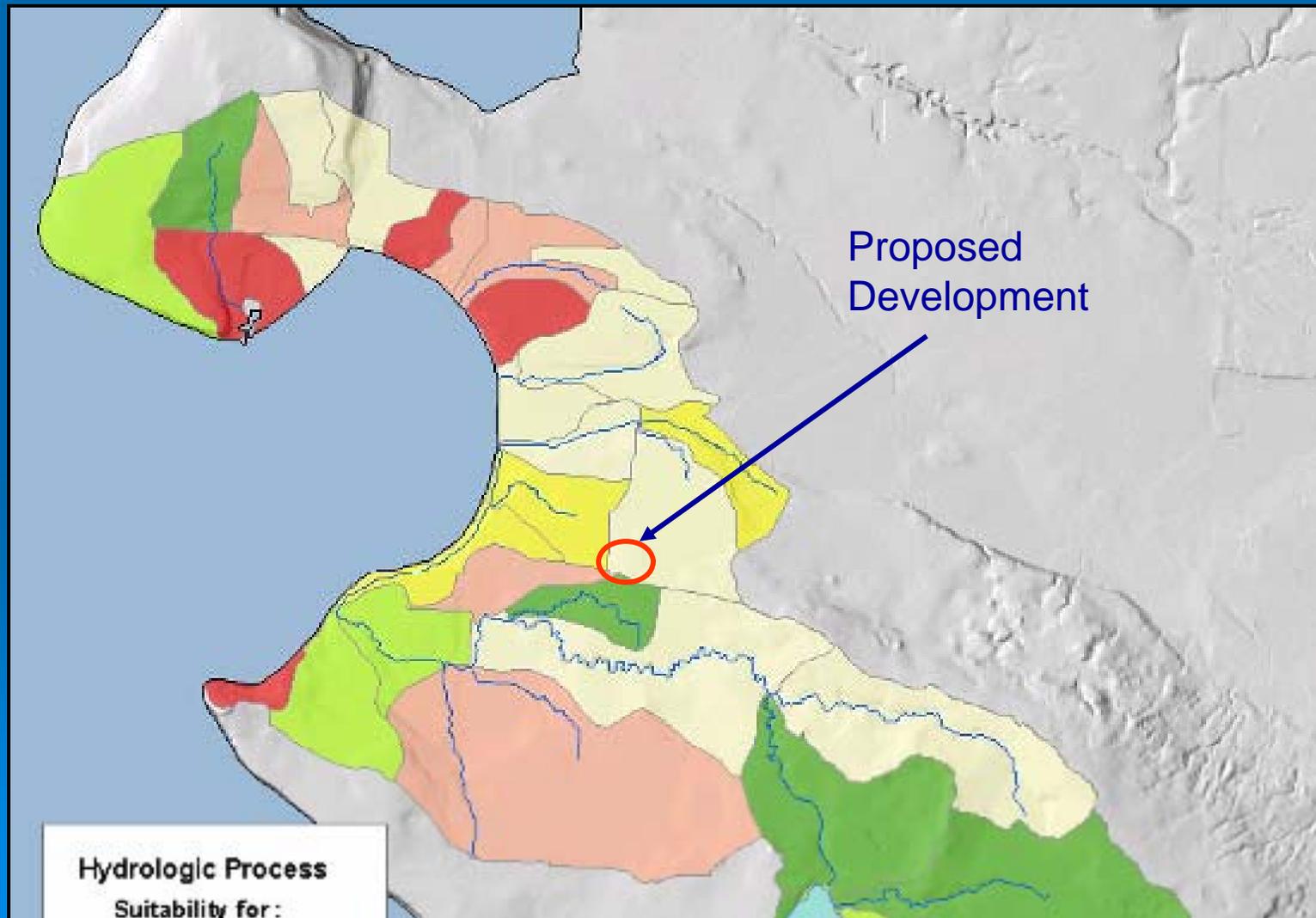


Synthesis: Identifying Solutions for Rural Properties

- **Special Development Fees** in “red” management units would be used to help farmers in green zone. Examples include:
 - Implementing Farm Plans in critical areas
 - Planting riparian buffer areas
 - Restoring degraded reaches of creeks
 - Purchasing conservation easements (similar to Wetland Reserve Program)
- Selling Credits to developers for wetlands created on rural properties



Applying Characterization Results at Fine Scale

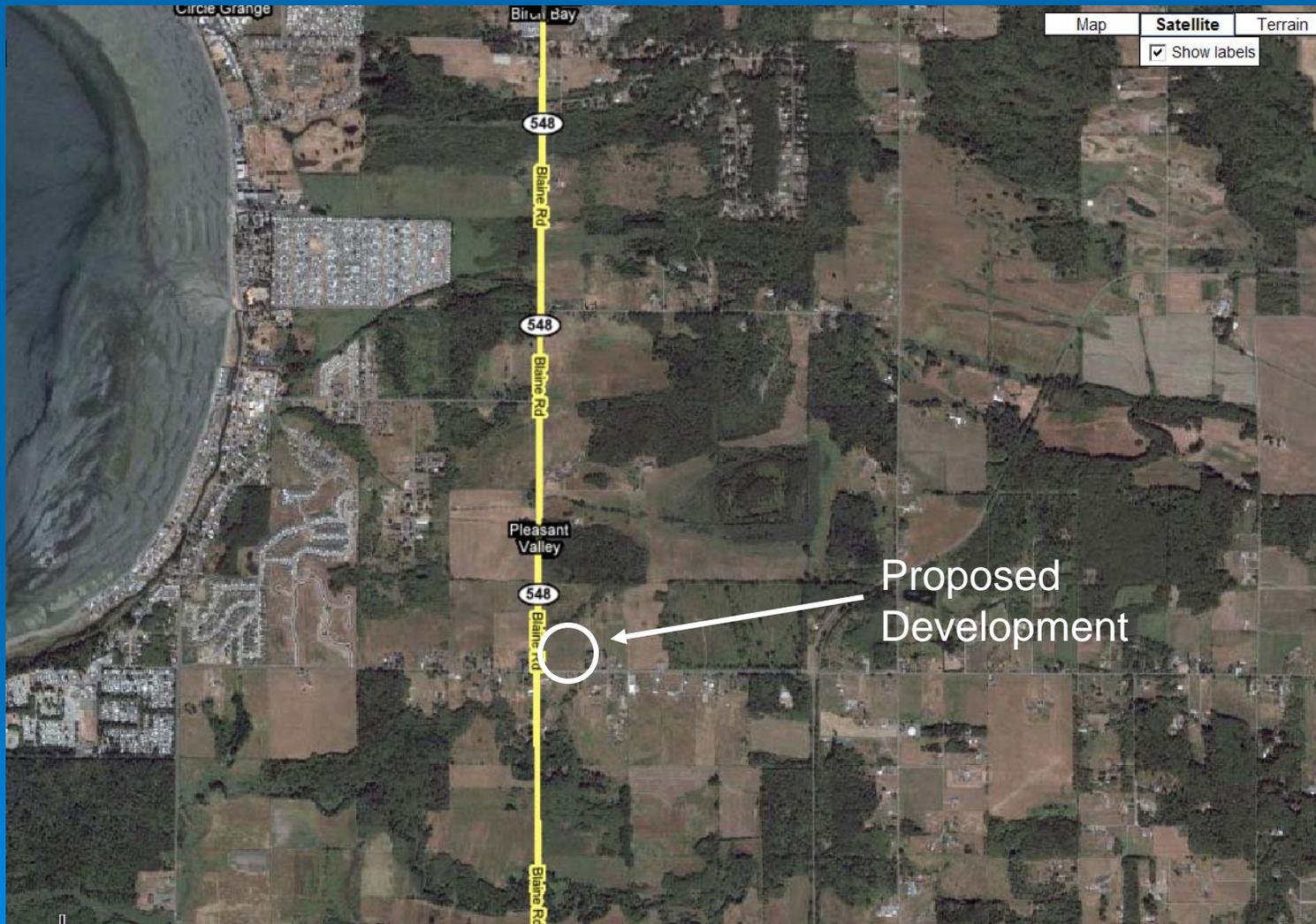


Water Flow Patterns

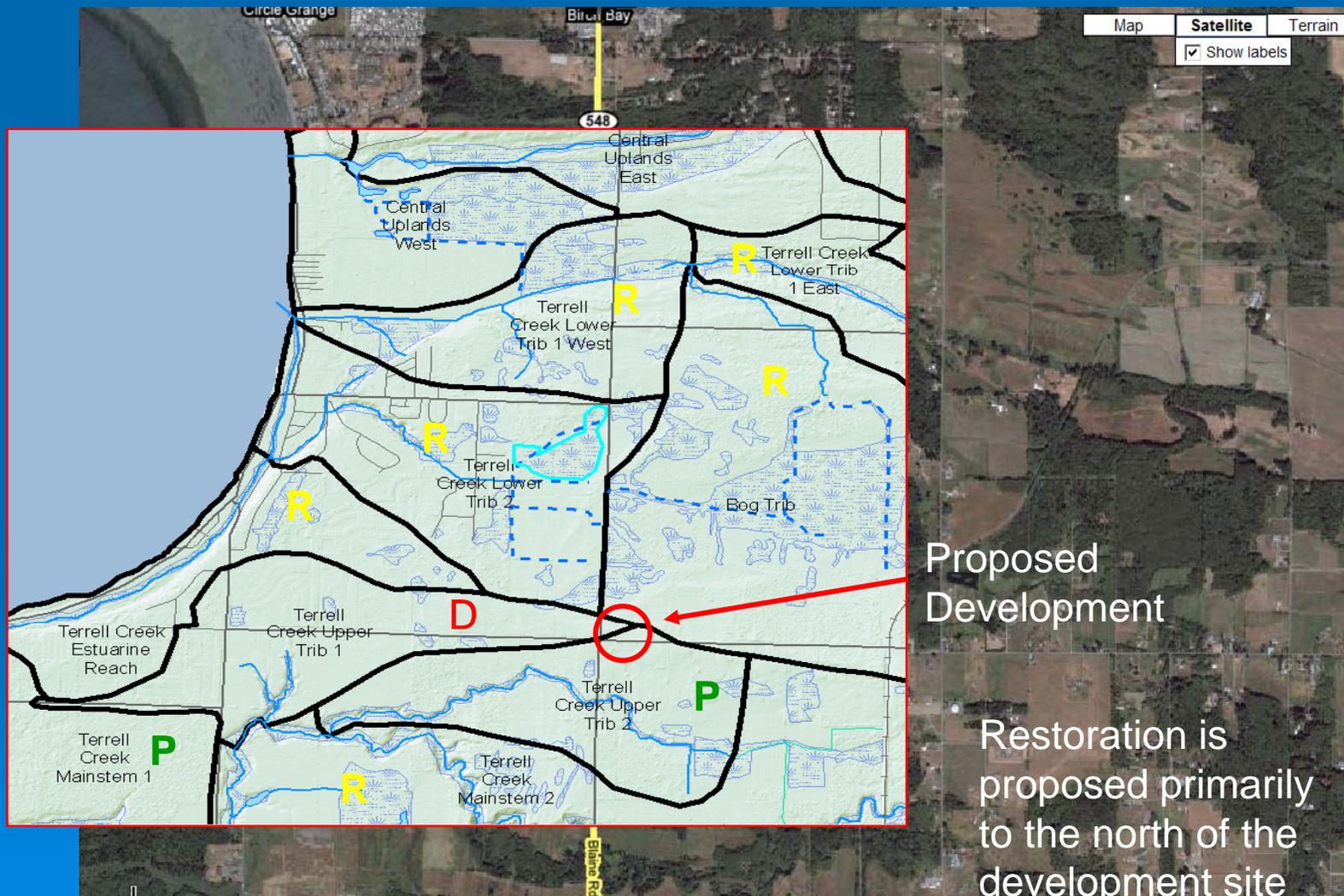


Proposed
Development

Surrounding Uses



Wetlands Inventory & Characterization Results



Surrounding Uses

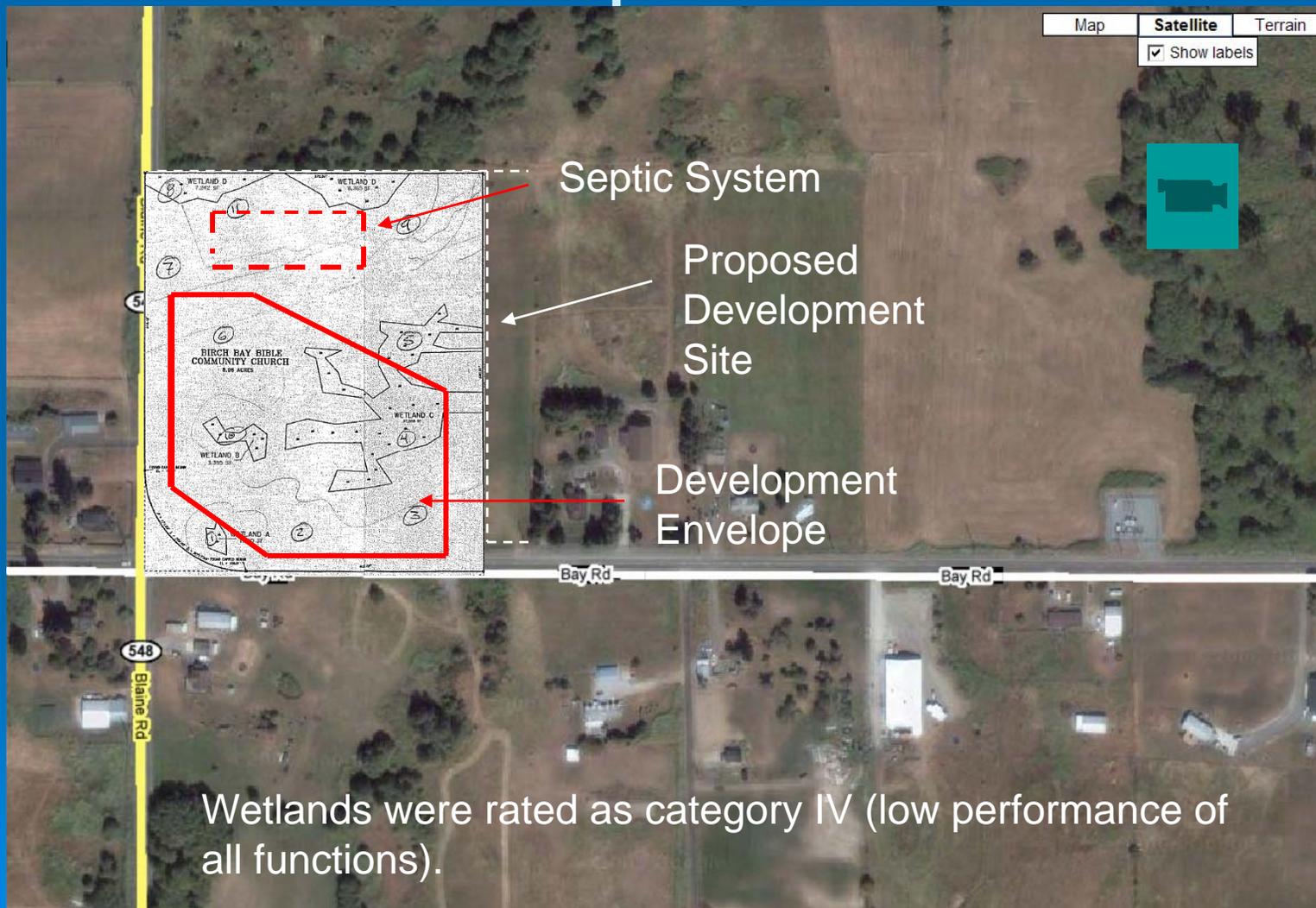
Offset Area



Surrounding Uses



Site Conditions & Development Impacts



Synthesis Table

Reach or Site Name	Rating of Processes and Functions (unimpaired condtions)	Rating of Impairment (existing conditions)	Recommended Solutions
<p>Bog Tributary</p>	<p>Processes – Potential is high for water flow process. Important area for groundwater discharge and surface storage</p> <p><i>(Use characterization of important areas or existing info from basin plans for this rating)</i></p> <p>Functions – Potential is high for functions. Historically a depressional wetland complex, including a large forested bog. High species richness for plant, amphibian, bird, fish and mammal species.</p> <p><i>(For functions use existing information from Priority Habitat and Species program, Salmonscape , local wetland inventories, local wildlife experts and watershed plans. Use wetland rating system results if available)</i></p>	<p>Processess – Moderate to High. The hydrology of the bog and adjoining wetlands has been affected by ditching and draining. This has reduced storage in the wetland complex, in turn affecting the flow regime in Terrell Creek.</p> <p><i>(Use characterization of impairments for this rating or existing info from basin plans).</i></p> <p>Functions - Extensive clearing of forest and scrub-shrub and emergent habitat has reduced species richness</p> <p><i>(Ratings from the characterization of individual components such as forest clearing, wetland loss and stream floodplain loss can provide an indirect assessment of impairment to functions. Existing basin plan information, including proper functioning conditions analysis can also be used).</i></p>	<p>Land Use – Key area for restoration. Measures to transfer develop rights (i.e. Transfer of Development Rights) and/or conservation easements in conjunction with clustering of development units should be used to protect and restore this depressional wetland complex.</p> <p>Restoration measures. Block or plug large ditches draining to the north and west of bog complex (see figure 22). Decommission smaller ditches in adjoining depression wetlands and replant with scrub-shrub and forested species.</p>

Recommended Mitigation Based on Watershed Conditions and Analysis



- Offset Area - Restore (rehabilitation and re-establishment) and enhance

Public Review Draft available on Website

(http://www.co.whatcom.wa.us/pds/shorelines_critical_areas/workproducts.jsp)

ESA Adolfson

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**BIRCH BAY WATERSHED CHARACTERIZATION
AND WATERSHED PLANNING PILOT STUDY**

PUBLIC REVIEW DRAFT

Prepared By: ESA Adolfson

In association with: Washington Department of Ecology, Department of Fish and Wildlife,
Puget Sound Partnership, and EPA

Prepared for: October 2007

Whatcom County Planning and
Development Services



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